

Syllabi of some courses where revision has been carried out

BCA-501 Cloud Computing

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L T P

3 - -

Credits: 3.0

Maximum Time: 3 Hrs.

Section – A

Cloud Computing Fundamentals: Introduction to various computing paradigms like Multitasking, Multiprocessing, Client Server Computing, Grid Computing, Utility Computing, Distributed Computing, Parallel Computing, Collaborative Computing, Peer to Peer Computing, Cluster Computing, Virtualisation, Cloud Computing, Application using all these Computing Technologies.

Section – B

Introduction: Objectives, Evolution of Cloud Computing, Characteristics of Cloud computing, Architecture of cloud computing, Cloud, Types of Clouds-Private, Public and Hybrid Clouds.

Services provided by Cloud: Software as a Service (SAAS), Platform as a Service (PaaS). Infrastructure as a Service (IaaS).

Service Management in Clouds: Service Level Agreements (SLAs), Types of SLA, SLA Management in Cloud.

Section – C

Virtualization: virtualized environments, Characteristics of virtualized environments, virtualization and Cloud computing, Advantages and Disadvantages of virtualization. Hypervisor, types of Virtualization.

Cloud Enablers: Business Intelligence on cloud, Big Data Analytics on Cloud.

Section – D

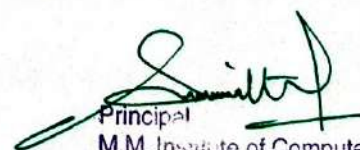
Cloud Security: Security Challenges and Risks in Cloud, Security Reference Model, Data Security, Application Security, Virtual Machine Security, Network Security, introduction to different vendor's offerings security in clouds

Text Books:

1. B. Raj Kumar, B. James, G.M. Andrezei, Cloud Computing: Principles and paradigms, Wiley Publication, reprint 2015.
2. T. Velte, Toby J. Velte, and Robert Elsenpeter, Cloud Computing: A Practical Approach, McGraw Hill, 2010.
3. Krutz, Ronald L Vines, Russell Dean, Cloud Security, A comprehensive Guide to Secure Cloud Computing, Wiley India, 2012.
4. B. Raj Kumar, V. Christian, S. ThamaraiSelvi, Mastering Cloud Computing, McGraw Hill Education, Reprint 2013.

Reference Books:

1. H. Judith, B. Robin, K. Marcia, H. Fern, Cloud Computing for dummies, John Wiley & Sons, IBM Limited edition, 2009.
2. K. Saurabh, Cloud Computing. Wiley India 2nd edition, reprint 2012.


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

ES-101 Environment Studies

Total Marks: 100
Theory Paper: 60
Internal Assessment: 40

L T P
4 - -

Credits: 4.0
Maximum Times: 3 Hrs.

Unit 1: Introduction to environmental studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

(2 lectures)

Unit 2: Ecosystems

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following eco systems :
 - a) Forest ecosystem
 - b) Grassland ecosystem
 - c) Desert ecosystem
 - d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

Unit 3: Natural Resources: Renewable and Non-renewable Resources

- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

(8 lectures)

Unit 4: Biodiversity and Conservation


- Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, biological
- Invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

(8 lectures)

Unit 5: Environmental Pollution

- Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies.

(8 lectures)


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

Unit 6: Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
 - Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
 - Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.
- (7 lectures)

Unit 7: Human Communities and the Environment

- Human population growth: Impacts on environment, human health and welfare.
 - Resettlement and rehabilitation of project affected persons; case studies.
 - Disaster management: floods, earthquake, cyclones and landslides.
 - Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
 - Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
 - Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).
- (6 lectures)

Unit 8: Field work

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted site--Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems--pond, river, Delhi Ridge, etc.

(Equal to 5 lectures)

Note for Paper-setter: EIGHT questions are to be set covering entire syllabus. Students will be required to attempt FIVE questions.

Suggested Readings:

1. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. *Global Ethics and Environment*, London, Routledge.
4. Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. *Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339: 36---37.
7. McCully, P. 1996. *Rivers no more: the environmental effects of dams* (pp. 29-64). Zed Books.
8. McNeill, John R. 2000. *Something New Under the Sun: An Environmental History of the Twentieth Century*.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. *Fundamentals of Ecology*. Philadelphia: Saunders.

10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.



Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

BCA-602R Programming

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L T P

3 - -

Credits:3.0

Maximum Times: 3 Hrs.

Section - A

Introduction: Overview and History of R, Code Editors for R, Getting Help, R and Rstudio set-up, basic syntax, Data Types, variables, operators, Subsetting, Vectorized Operations, Objects and Classes, Running R Programs.

Section - B

Control Structures, Conditional Executions: Comparison Operators, Logical Operators, If Statements, If else Statements. Loop Functions: Looping on the Command Line, lapply(), sapply(), split(), Splitting a Data Frame, tapply, apply(), mapply(). Coding Standards, Scoping Rules, Debugging Utilities, Regular Expressions, Interpreting Character String as Expression, Time, Date and Sleep, Calling External Software with System Command, Miscellaneous Utilities.

Section - C

Data with R: Objects, Reading and writing data, Saving data, Generating data, Regular sequences, Random sequences, Manipulating objects, Creating objects, Converting objects Operators, Accessing the values of an object, the indexing system, Accessing the values of an object with names, The data editor, Arithmetic's and simple functions; R-string, R-vector, R-lists, R-Matrices, R-array.

Section - D

Graphics with R: Managing graphics, Opening several graphical devices, Partitioning a graphic, Graphical functions, Low-level plotting commands, Graphical parameters, The grid and lattice packages,


Statistical analyses with R: A simple example of analysis of variance, Formulae, Generic functions, Packages.

Text Books:

1. William N. Venables and David M. Smith, An Introduction to R. 2nd Edition. Network Theory Limited.2009
2. Roger D. Peng, R Programming for Data Science, lulu.com, April 20, 2016.
3. Sandip Rakshit, R Programming For Beginners, ed. 1, McGraw-Hill India
4. Gardner Mark, Beginning R: The Statistical Programming Language - The Statistical Programming Language, Wiley india Pvt. Ltd
5. Andrie de Vries, R For Dummies 2nd Edition, Kindle Edition

Reference Books

1. Garrett Grolemond, Hands-On Programming with R: Write Your Own Functions and Simulations, O'Reilly Media, Inc.
2. John Verzani, Using R for Introductory Statistics, Chapman & Hall/CRC, 2004.
3. Hadley Wickham, Advanced R, CRC Press, September 2015.


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

MCA-101 Computer Fundamentals & Web Design

Total Marks: 100

L T P

Credits: 3.0

Theory Paper: 60

3 - -

Maximum Time: 3 Hrs.

Internal Assessment: 40

Section – A

Computer Fundamentals: Computer components, characteristics & classification of computers, hardware & software, Peripheral devices. Display devices: Raster scan, Vector scan and storage tube display, programming languages: Low level programming languages: Machine and Assembly languages, High level languages, problem oriented languages. Translation process: Assembler, Compiler, Interpreter.

Section-B

Internet: Concept of Internet, evolution, Specification and establishment, Internet domains, DNS, ISP, Intranets and extranets, Email architecture.

World Wide Web: Web Concepts, Scripting languages: Server side, Client Side. Web site development Phases, Web: Designing, Development and Publishing, HTTP, URL registration, browsers, search engines, Web server, Proxy servers.

Section-C

HTML5: Concepts, Structure of HTML documents, HTML Elements, new Elements in HTML5, lists, Hyperlinks, Images and Anchors, Image Maps, multimedia, Image Preliminaries, Image Download issues, Images as Buttons, Meta Information, Introduction to Layout: Backgrounds, Colors and Text, Fonts, Layout with Tables.

Section-D

Advanced Layout: Frames, Style Sheets, Positioning with Style sheets, working with Forms Control.

XML: Relationship between SGML, HTML, XHTML and XML, Basic XML, Valid Documents. Ways to use XML, XML for Data Files, Embedding XML into HTML documents, Converting XML to HTML for DISPLAY, Displaying XML using CSS and XSL, Rewriting HTML as XML, The future of XML.

Text Books:

1. P.K. Sinha, Priti Sinha, Computer Fundamentals, BPB Publications, 6th ed., 2014.
2. Thomas A. Powell, The Complete Reference HTML & XHTML, TMH, 4th ed., 2005.
3. Margaret Levine Young, Internet-The Complete Reference, Tata Mc-Graw Hill, 2nd ed., 2010.
4. Honey Cutt, Using the Internet, PHI, 4th ed., 1998.
5. Atul Kahate, Cryptography and Network Security, Tata McGraw Hill, 3rd ed., 2013.

References Books:

1. Xavier, World Wide Web Design with HTML, TMH, 2013.
2. Achyut S Godbole & Atul Kahate, Web Technologies, Tata McGraw-Hill, 3rd ed., 2013.
3. Brian K Williams & Stacey C. Sawyer, Using Information Technology, TMH, 6th ed., 2008.


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala -33-207

MCA-103 Discrete Mathematical Structure

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L T P

3 1 -

Credits: 4.0

Maximum Time: 3 Hrs.

Section – A

Graphs: Introduction to graphs, Graph terminology, Representing Graphs and Graph Isomorphism, Connectivity. Directed and undirected graphs and their matrix representations, reachability, Chains, Circuits, Euler's paths and cycles, Hamiltonian paths and cycles, Minima's Path Application (Flow charts and state transition Graphs, Algorithm for determining cycle and minimal paths), Graph coloring.

Tree: Definition, Tree Terminology, General Tree, Binary trees, Binary search trees and Tree Traversals.

Section – B

Mathematical Logic: Statement and notations, Connectives, Statement formula and truth table, Conditional and bi-conditional statement, Tautology and Contradiction, Equivalence of formulas, Tautological implications.

Recurrence Relation: Linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Formal Languages: Representation of special languages and grammars, finite state machines.

Section – C

Groups & Subgroups: Definition, Binary Operations, Algebraic Structure, Semigroup, Group, Composition table for finite sets, Addition modulo m , Multiplication modulo m , Permutations, group of permutation, cyclic permutation, Transposition, Even and Odd Permutation, Homomorphism and Isomorphism of semigroup, Subgroups and order, Cyclic groups, Cosets, Lagrange's theorem.

Finite Fields: Definition, representation, structure, minimal polynomials, polynomial roots, Splitting Field, Integral Domain, Irreducible polynomial.

Section – D

Partial Order Sets: Definition, Partial order sets, Combination of partial order sets, Hasse Diagram, Lattices: Definition, Properties of Lattices- Bounded, Complemented, modular and complete lattice, Distributive Lattice, Duality.


Boolean Algebra: Axiomatic definition of Boolean algebra as algebraic structures with two operations basic results truth values and truth tables, the algebra of propositional functions, Boolean algebra of truth values, Applications (Switching Circuit, Gate Circuit).

Text Books:

1. Kenneth G. Rosen, Discrete Mathematics and Its Applications, Mc-Graw Hill International Edition, Mathematics Series, 7th ed., 2014.
2. Babu Ram, Discrete Mathematics and Its Applications, Vinayaka Publications, 1st ed., 2004.
3. C.L. Liu, Discrete Mathematics and Its Applications, Mc-Graw Hill International Edition, Mathematics Series.
4. Alan Doerr, Kenneth Levaseur, Applied Discrete Structures for Computer Sciences, Galgotia Publications Pvt. Ltd., 2014

Reference Books:

1. Trembley, Discrete Mathematics and Its Applications, Tata Mc-Graw Hill.
2. Scymour Lipschutz, Marc Lars Lipson, Discrete Mathematics, McGRAW Hill International Editions, Schaum's Series, 3rd ed., 2010.
3. Bernard Kolman, Robert C. Busby, Discrete Mathematical Structures for Computer Science, Prentice Hall of India, 3rd ed., 2001.


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

MCA - 105 Software Engineering

Total Marks: 100
Theory Paper: 60
Internal Assessment: 40

L T P
3 - -

Credits: 3.0
Maximum Time: 3 Hrs.

Section – A

Introduction to Software Engineering: Software crisis, Software engineering Approach and Challenges, Software development process models with comparison: Waterfall, Rapid prototyping, Time boxing and Spiral Models and Automation through software environments.

Section – B

Planning the Software Project: Cost estimation: COCOMO model, Risk management, project scheduling, personnel planning, team structure, Staffing, Software configuration management, quality assurance, project monitoring.

Structured Analysis: Initial Investigation, Feasibility study, Traditional and modern methods of requirement determination, SRS, Structuring the requirements: Process modeling, logic modeling, conceptual data modeling, Metrics.

Section – C

Design Fundamentals: Principles of modularization, structured design methodologies, coupling and cohesion, high level and detailed design, overview of Verification and Validation, Design Fundamentals: Function and Object Oriented Design concepts, Verification and Metrics.

Coding: Coding Process, Programming style, structured programming.

Section – D

Software Testing and Maintenance: Testing fundamentals, levels, test activities, types of s/w test, black box testing, testing boundary conditions, structural testing, functional testing, regression testing, software testing strategies, unit testing, integration testing, validation testing, system testing and debugging, Metrics and Types of Maintenance.

Software Re-Engineering: Source Code Translation, Program Restructuring, Data Re-Engineering, Reverse Engineering.

Text Books:

1. Hoffer, George, Valacich, Modern System Analysis and Design, Pearson, 3rd ed., 2004.
2. Jalote Pankaj, An integrated Approach to Software Engineering, Narosa Publishing House, 3rd ed., 2011.
3. Pressman S. Roger, Software Engineering, Tata McGraw-Hill.

Reference Books:

1. Gill S. Nasib, Software Engineering, Khanna Publishers, 6th ed., 2010.
2. Sommerville Ian, Software Engineering, Addison Wesley, 9th ed., 2013.
3. Fairlay, Software Engineering, McGraw Hill, 2008.
4. Petters Pedryz, Software Engineering, Wiley, 2000.


Principal

M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mulana Ambala 133-207

CS-03 SAP LAB

Total Marks: 100
Theory Paper: 60
Internal Assessment: 40

L T P
- - 2

Credits: 2.0
Maximum Time: 3 Hrs.

Section-A

Introduction to SAP: SAP Company History, SAP Solutions, SAP Portfolios.
SAP Navigation: Logging onto an SAP system, Navigation in the SAP system: Screen Structure, Role based User Menus, Favorites, Navigation Options, Transaction Codes, Multiple Logon & Multiple Sessions, Help and Personalizing Your UI

Section-B

System Wide Concept: Organizational Elements, System wide Master Data Concepts
Logistics: Logistics overview, Sales Order Management, CRM, Production, SCM, Procurement, SRM, Product Life Cycle Management.

Section-C

Financials: SAP ERP Financials, Financial Accounting & SAP Financial SCM, Management Accounting and Corporate Governance.
Human Capital Management: Organizational Management Objects, Personnel Management, Training & Event Management, Time Management, Payroll, Personnel Cost Planning.

Section-D

Analytics and Strategic Planning: Business Intelligence, OLTP vs. OLAP, SAP BI, Business performance Optimization, Enterprise Performance Management.
SAP NetWeaver: SAP NetWeaver Application Server, Data Structure of SAP System, SAP Services.

Text Book:

1. SAP Overview: Participant Handbook by SAP AG.


Principal

M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

CS-03 SAP LAB

Total Marks: 100
Theory Paper: 60
Internal Assessment: 40

L T P
- - 2

Credits: 2.0
Maximum Time: 3 Hrs.

Section-A

Introduction to SAP: SAP Company History, SAP Solutions, SAP Portfolios.

SAP Navigation: Logging onto an SAP system, Navigation in the SAP system: Screen Structure, Role based User Menus, Favorites, Navigation Options, Transaction Codes, Multiple Logon & Multiple Sessions, Help and Personalizing Your UI.

Section-B

System Wide Concept: Organizational Elements, System wide Master Data Concepts.

Logistics: Logistics overview, Sales Order Management, CRM, Production, SCM, Procurement, SRM, Product Life Cycle Management.

Section-C

Financials: SAP ERP Financials, Financial Accounting & SAP Financial SCM, Management Accounting and Corporate Governance.

Human Capital Management: Organizational Management Objects, Personnel Management, Training & Event Management, Time Management, Payroll, Personnel Cost Planning.

Section-D

Analytics and Strategic Planning: Business Intelligence, OLTP vs. OLAP, SAP BI, Business performance Optimization, Enterprise Performance Management.

SAP NetWeaver: SAP NetWeaver Application Server, Data Structure of SAP System, SAP Services.

Text Book:

1. SAP Overview: Participant Handbook by SAP AG.



Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharshi Markandeshwar
(Deemed to be University)
Mullana, Ambala 133-207

MCA – 501 Advanced Java Programming

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L	T	P
3	-	-

Credits: 3.0

Maximum Time: 3 Hrs.

Section – A

Introduction to J2EE: J2EE Architecture, J2EE Technologies, Developing J2EE Applications, Business tier using POJO (Plain Old Java Objects), Role of J2EE in Enterprise applications.

Database Programming with JDBC: Database Drivers, JDBC packages, Database Connection, Statement Objects, Result Set, Transaction Processing, SQL Exception, Prepared Statement.

Section – B

Network Programming: Client-Server communication, Host Identification and service ports, Socket Based Communication, Java.NET classes and Interfaces, TCP/IP Socket Programming and UDP Socket Programming, Reading and Writing data via URL Connection.

Java Beans: Definition, advantages of Java Beans, Java Beans API, Introspector, Property Descriptor, eventSet Descriptor and Method Descriptor.

Section – C

Java Servlets API: HTTP protocol, Life cycle of a Servlet, Servlet Implementation, Servlet Configuration, Servlet Exceptions, Request and responses, Session Tracking, Servlet Context, Servlet Collaboration.

Filters & Frameworks: Introduction to Filter, Filter API, Deployment Descriptor for Filters, Frameworks overview: Struts, Spring and Hibernate.

Section – D

Remote Method Invocation (RMI): RMI, Object Serialization, RMI layer model, Skelton, Stub, java.rmi package: Remote interface, Naming, RMI Security Manager, Remote Exception, java.rmi.registry package: Registry interface, Locate Registry, java.rmi.server package: Remote Object, Remote Server.

Enterprise Java Beans: EJBs, EJB Container and its services, Working with EJBs, Types of EJB.

Text Books:

1. Subrahmanyam Allamaraju, Cedric Buest, Professional Java Server Programming J2EE 1.3 Edition, Apress, Third Reprint, 2011
2. Jim Keogh, J2EE: The Complete Reference, Tata McGrawHill, 14th reprint, 2005.
3. Y. Daniel Liang, Introduction to Java Programming Comprehensive Version, Pearson, 7th ed., 2013.

Reference Books:

1. Stephen Asbury, Scott R. Weiner, Developing Java Enterprise Applications, Wiley, 1998
2. Cay S. Horstmann, Gray Cornell, Core Java 2 Volume II-Advanced Features, Sun Microsystems Press, Pearson Education, 9th ed., 2013.
3. H.M. Deitel, P.J. Deitel, Head First Java How to Program, Pearson Education, 6th ed., 2008.


Principal of Computer Technology
M.M. of Computer Technology
& Business Management (MCA)
Maharishi Merkanadeshwar
(Deemed to be University)
Mullana-Ambala 133-207

MCA 504 (a) .NET Technologies

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L T P

3 1 -

Credits: 4.0

Maximum Time: 3 Hrs.

Section - A

Introduction: concepts .NET, Introduction to Visual Studio .NET IDE, Common Language Runtime (CLR), The .NET Framework Class Library (FCL), C# and Other .NET Languages, Common Type System, Common Language Specification.

C#.Net: What is C#, Why C#, Comparison b/w C++, C# and Java, Characteristics of C#, Relationship b/w .Net Framework & C#.

Basic .NET Programming using C#: Structure of a C# Program, Elements of C#.Net program, Data types, Operators and Expressions, Control constructs: Decision making & Loops, Boxing and Unboxing, Methods in C#, Method Overloading, Arrays & Strings and Structures & Enumerations.

Section - B

Object-oriented Programming with C#.Net: Classes & Objects, Overloaded Constructors & Static Constructors, Private & Copy Constructors, Garbage Collection & Destructors, this Reference, Constant & Read-only Members

Implementing C#.Net Language Features and Classes: Sealed Classes & Methods, Abstract Classes and Methods, Interfaces, Indexers & Properties, Collections, Enumerators and Iterators

Section - C

Handling File, Exception and Events: File Handling, Exception Handling, Multithreading in C#, Delegates & Events.

Managing Data with ADO.NET: Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, DataSet Class, Display data on data bound Controls and Data Grid, LINQ to DataSet.

Section - D

Building Web Applications with ASP.NET: ASP.NET and Web Services, Introduction to Web Applications, Introduction to ASP.NET, ASP.NET Web Forms, ASP.NET Controls, Error Handling and Tracing, Data Binding, ASP.NET Built in Objects.

Text Books:

1. E. Balaguruswamy, Programming in C#, Tata McGraw-Hill, 3rd ed., 2010.
2. Herbert Schildt, The Complete Reference: C#, Tata McGraw-Hill, 2010.
3. Joe Mayo, C# 3.0 Unleashed with the .NET Framework 3.5, Pearson Education, 2nd ed., 2008.

Reference Books:

4. Ferguson, Patterson, Beres, Boutquin & Gupta, C# Programming Bible, Wiley India, 2007.
5. Barbara Doyle, Programming in C#, Cengage Learning India Pvt. Ltd, 2009.
6. Harvey M. Deitel & Paul J. Deitel, Deitel Developer Series – C# for Programmers, Pearson Education, 4th ed., 2011.
7. Ben Watson, C# 4.0 How To Real Solutions for C# 4.0 Programmers, Pearson Education, 2010.
8. Anders Hejlsberg, Scott Wiltamuth, Peter Golde, The C# Programming Language, Pearson Education, 3rd, 2010.

Principal

M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

MCA-504 (c) Internet of Things

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L T P

3 1 -

Credits: 4

Maximum Time: 3 Hrs.

Section – A

Introduction to Internet of Things: Definition and characteristics of IoT, Physical design of IoT, Logical design of IoT, IoT enabling techniques, An Architectural Overview of IoT, standards considerations. M2M and IoT Technology, Everything as a Service (XaaS), M2M and IoT Analytics, Applications: smart cities, smart living, smart energy, smart health, smart transportation and smart learning etc.

Section – B

IoT Architecture: Introduction, Reference Model and architecture -Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, Real-World Design Constraints- Introduction, Technical Design constraints.

Section – C

IoT Protocols: Zigbee and Zwave - advantage of low power mesh networking. Long distance Zigbee. Bluetooth/BLE: Low power vs high power, speed of detection, class of BLE.

Wireless Protocols: Piconet, BLE, Zigbee etc. Other long distance RF communication link, IEEE 802.11, IEEE 802.15. LOS vs NLOS links, Capacity and throughput calculation. Application issues in wireless protocols: power consumption, reliability, PER, QoS, LOS.

Section – D

IoT Platforms: Introduction to Mobile app platform for IoT: Protocol stack of Mobile app for IoT, iBeacon in iOS, Window Azure, Linkafy Mobile platform for IoT, Xively. Introduction to open source /commercial enterprise cloud platform for IoT- iO Bridge, Libellium, Axeda etc. Basic Open source platforms: Arduino, Raspberry Pi, Beagle Bone.

Text Books:

1. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, Wiley-Blackwell.
2. Vijay Madiseti and ArshdeepBahga, Internet of Things (A Hands-on Approach), 1st Edition, VPT, 2014.
3. Mandler, B., Barja, J., Mitre Campista, M.E., Cagá_ová, D., Chaouchi, H., Zeadally, S., Badra, M., Giordano, S., Fazio, M., Somov, A., Vieriu, R.-L., Internet of Things. IoT Infrastructures, Springer International Publishing.

Reference Books:

1. Peter Waher, Learning Internet of Things, PACKT publishing, Birmingham, Mumbai.
2. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, 1st Ed., Academic Press, 2014.

Principal

M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

MCA 505 (c) Cryptography and Network Security

Total Marks: 100

Theory Paper: 60

Internal Assessment: 40

L	T	P
3	1	-

Credits: 4.0

Maximum Time: 3 Hrs.

Section-A

Introduction: Principal of Security, Basic Security Components, Security Threats.

Cryptography: Cryptosystem, Type of Cryptography, Cryptographic Principles, Substitution and Transposition Ciphers, Block Cipher, Cipher Block, Cipher Modes of Operation, Stream Cipher.

Secret-Key Algorithms: DES, Breaking DES, AES.

Public-Key Algorithms RSA.

Section-B

Authentication Protocols: Digital Signatures, Message Digest, MD5, SHA, HMAC, PKI, KDC protocols, Diffie-Hellman Key Exchange, Needham Schroeder protocol, Passwords- Technology and Administration, Kerberos, PGP, S/MIME, IPsec, VPN.

Section-C

Operating System Security: Access Control, Security Models: Introduction to Discretionary v/s Mandatory Access Control, Bell-La-Padula model, Biba model, Chinese Wall model.

Malicious Code: Malicious software and its types, Life cycle of a Computer Virus, Virus Countermeasures, TCP/IP Vulnerabilities, DoS and DDoS Attacks.

Section-D

Firewall: Types of Firewall, Design Principal of Firewall, Firewall Limitation, DMZ.

Intrusion Detection System (IDS): IDS Models, IDS Architecture.

Internet Security: Secure Socket Layer (SSL), Secure Electronic Transaction (SET), 3-D secure protocol.

Text Books:

1. Network Security Architectures by Sean Convery, Published by Cisco Press, 2004.
2. Cryptography and Network Security by William Stallings, Pearson Education.
3. Security in Computing by Charels P. Pfleeger, Prentice Hall.
4. Inside Internet Security by Jeff Crume, Addison Wesley.

Reference Books:

1. Network security by Richard H. Baker, Mcgraw Hill International, 1996.
2. Applied Cryptography by B. Schneier, John Wiley, New York, 1996.
3. Network security by C. Kaufman, Prentice Hall International, 1998.


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

CS-04 SAP-ABAP

Total Marks: 100
Theory Paper: 60
Internal Assessment: 40

L T P
- - 3

Credits: 3.0
Maximum Time: 3 Hrs.

Section-A

Introduction: SAP systems, SAP portfolio overview, Navigation basics, System core: AS ABAP, AS JAVA architecture and various processes, Communication and Integration technologies. Introduction to data dictionary, database tables, views, domain, data types, type group, search help, indexes, text table.

Section-B

Introduction to ABAP programming: Data types, types of programs, create packages, internal tables, various operations on internal tables, Joins, Control break statements, Data selection statements, modularization techniques: function modules, subroutines, includes.

Section-C

Classical ABAP reports, Selection screen, Introduction to screen programming: simple screen elements, screen error handling, subscreens, tabstrip controls, ALV: classical ALV reports, function module ALV.

Section-D

Introduction to object oriented programming and its syntax, inheritance and casting, interfaces and casting, object oriented events, object oriented repository objects, class based exceptions, design patterns, program calls and memory management, introduction to Webdynpro, enhancement of dictionary elements.

Text Books:

1. TAW-10: ABAP Workbench Fundamentals Part-I, SAP Education India.
2. TAW-10: ABAP Workbench Fundamentals Part-II, SAP Education India
3. TAW-12: ABAP Workbench Concepts Part-I, SAP Education India.
4. TAW-12: ABAP Workbench Concepts Part-II, SAP Education India.


Principal
M.M. Institute of Computer Technology
& Business Management (MCA)
Maharishi Markandeshwar
(Deemed to be University)
Mullana-Ambala 133-207

BFST FIRST SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-101	Fundamentals of Food Technology	3	-	40	60	100	3
	BFST-101 (Pr)	Fundamentals of Food Technology Practical		4	60	40	100	2
	BFST-103	Principles of Food Science	3	-	40	60	100	3
	BFST-103 (Pr)	Principles of Food Science Practical		4	60	40	100	2
AECC	BFST-105	Environmental science	3	-	40	60	100	3
GE	BFST-107	Food Processing and Preservation	3		40	60	100	3
SEC	BFST-109	Computer applications	3	-	40	60	100	3
	BFST-109 (Pr)	Computer applications Practical	-	4	60	40	100	2
	BFST-111	SEMINAR		2	100	-	100	1
		Total	15	14	480	420	900	22

BFST SECOND SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-102	Technology of Food Preservation	3	-	40	60	100	3
	BFST-104	Food Processing Technology	3	-	40	60	100	3
	BFST-104 (Pr)	Food Processing Technology Practical	-	4	60	40	100	2
AECC	BFST-106	English Communication	3	-	40	60	100	3
DSE	BFST-108	Bakery Technology	3		40	60	100	3
	BFST-108 (Pr)	Bakery Technology Practical	-	4	60	40	100	2
	BFST-110	Food Safety, laws & regulation	3	-	40	60	100	3
SEC	BFST-112	Food Fermentation Technology Practical	-	4	60	40	100	2
		Total	15	12	380	420	800	21


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

BFST THIRD SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-201	Food and Nutrition	3	-	40	60	100	3
	BFST-201 (Pr)	Food and Nutrition Practical	-	4	60	40	100	2
	BFST-203	Technology of Fruits, Vegetables and Plantation Crops	3	-	40	60	100	3
	BFST-203 (Pr)	Technology of Fruits, Vegetables and Plantation Crops Practical	-	4	60	40	100	2
	BFST-205	Milk & Milk Products Technology	3	-	40	60	100	3
SEC	BFST-207	Entrepreneurship Development	3	-	40	60	100	3
GE	BFST-209	Food engg. & Packaging	3	-	40	60	100	3
DSE	BFST-211	Food hygiene & Sanitation	3	-	40	60	100	3
		Total	18	8	360	440	800	22

BFST FOURTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-202	Technology of Cereals, Pulses and Oilseeds	3	-	40	60	100	3
	BFST-202 (Pr)	Technology of Cereals, Pulses and Oilseeds Practical	-	4	60	40	100	2
	BFST-204	Food Microbiology	3	-	40	60	100	3
	BFST-204 (Pr)	Food Microbiology Practical	-	4	60	40	100	2
	BFST-206	Technology of Meat, fish and Poultry	3	-	40	60	100	3
GE	BFST-208	Food Quality and Sensory Evaluation	3	-	40	60	100	3
	BFST-208 (Pr)	Food Quality and Sensory Evaluation Practical	-	4	60	40	100	2
DSE	BFST-210	BEVERAGE TECHNOLOGY	3	-	40	60	100	3
	BFST-218	A Case Study of an organization	2	-	100	-	100	1
		Total	17	12	380	420	900	22


Principal
 NMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

BFST FIFTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-301	Food Engineering	3	-	40	60	100	3
	BFST-303	Food Chemistry	3	-	40	60	100	3
	BFST-303 (Pr)	Food Chemistry Practical	-	4	60	40	100	2
DSE	BFST-305	Nutraceutical and Functional Foods	3	-	40	60	100	3
	BFST-307	Food Quality Management	3	-	60	40	100	2
GE	BFST-309	Food Packaging	3	-	40	60	100	3
	BFST- 309 (Pr)	Food Packaging Practical	-	4	60	40	100	2
SEC	BFST-311	Project and Technical Report	3	-	100	-	100	3
		Total	18	08	400	360	800	21

BFST SIXTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BFST-302	Training Log Book/ Training Report	-	10	100	-	100	10
	BFST-304	Presentation	-	4	100	-	100	4
	BFST-306	Viva-Voce	-	8	100	-	100	8
TOTAL				22	300		300	22


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
Fundamentals of Food Technology
Ist Semester; 1st Year of the Three-Year Degree Program
BFST-101

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To understand the history and evolution of food processing.
- To study the structure, composition, nutritional quality and post harvest changes of various plant foods.
- To study the structure and composition of various animal foods.

UNIT 1

Introduction, Historical evolution of food processing technology.

Structure and composition of cereals, Wheat- structure and composition, types (hard, soft/ strong, weak) Diagrammatic representation of longitudinal structure of wheat grain. Malting, gelatinization of starch, types of browning- Maillard&caramelization. Rice- structure and composition, parboiling of rice- advantages and disadvantages.

UNIT II

Structure and composition of pulses, toxic constituents in pulses, processing of pulsesoaking, germination, decortications, cooking and fermentation. Classification of lipids, types of fatty acids - saturated fatty acids, unsaturated fatty acids, essential fatty acids, trans fatty acids. Refining of oils, types- steam refining, alkali refining, bleaching, steam deodorization, hydrogenation. Rancidity –Types- hydrolytic and oxidative rancidity and its prevention.

UNIT-III

Classification of fruits and vegetables, general composition, enzymatic browning, names and sources of pigments, Dietary fibre. Post harvest changes in fruits and vegetables – Climacteric rise, horticultural maturity, physiological maturity, physiological changes, physical changes, chemical changes, pathological changes during the storage of fruits and vegetables.

Meat - Definition of carcass, concept of red meat and white meat, composition of meat, marbling, post-mortem changes in meat- rigor mortis, tenderization of meat, ageing of meat.

UNIT-IV

Fish - Classification of fish (fresh water and marine), aquaculture , composition of fish, characteristics of fresh fish, spoilage of fish- microbiological, physiological, biochemical. Poultry - Structure of hen's egg, composition and nutritive value, egg proteins, characteristics of fresh egg, deterioration of egg quality, difference between broiler and layers.

Definition of milk, chemical composition of milk, its constituents, processing of milk, pasteurization, homogenization. An overview of types of market milk and milk products.

Recommended Readings

1. Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013
2. Roday,S. Food Science, Oxford publication, 2011.
3. B. Srilakshmi, Food science, New Age Publishers,2002
4. Meyer, Food Chemistry, New Age,2004
5. De Sukumar., Outlines of Dairy Technology, Oxford University Press, 2007


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Principles of Food Science
Ist Semester; 1st Year of the Three-Year Degree Program
BFST-103

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

To impart basic knowledge of:

- Food Dispersions
- Sensory science
- Food Science
- Food Sanitation
- Packaging Materials

UNIT-I

Characteristics, sols, gels, pectin gels, colloidal sols, stabilization of colloidal system, syneresis, emulsions, properties of emulsions, formation of emulsion, emulsifying agent, food foams, formation stability and destruction of foam, application of colloidal chemistry to food preparation.

UNIT-II

Objectives, type of food panels, characteristics of panel member, layout of sensory evaluation laboratory, sensitivity tests, threshold value, paired comparison test, duotrio test, triangle test, hedonic scale, chemical dimension of basic tastes, Amoore's classification of odorous compounds. Sherman and Szczniak classification of food texture.

UNIT-III

Food as a substrate for microorganism, factors affecting growth of microbes : pH, water activity, O-R potential, nutrient contents, inhibitory substance and biological structure. Principles and applications of **Hurdle technology**, Hurdle effect in fermented foods, shelf stable products, intermediate moisture foods, application of hurdle technology. Minimal processing of foods with thermal methods and non thermal methods-safety criteria in minimally processed foods-Minimal processing in practice-fruits and vegetables-seafood-effect on quality-Future developments

UNIT-IV

Ohmic heating and High Pressure processing: Principles, equipment and processing, effect on food.

Water disposal and sanitation: Waste water, hardness of water, break point chlorination, physical and chemical of impurities, BOD, COD, waste water treatment, milk plant sanitation, CIP system, sanitizers used in food industry.

Recommended Readings

1. Coles R, McDowell D and Kirwan MJ, Food Packaging Technology, CRC Press, 2003
2. De S, Outlines of Dairy Technology, Oxford Publishers, 1980
3. Deman JM, Principles of Food Chemistry, 2nded. Van Nostrand Reinhold, NY 1990
4. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004
5. Jenkins WA and Harrington JP, Packaging Foods with Plastics, Technomic Publishing Company Inc., USA, 1991
6. Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi, 1987
7. Meyer LH, Food Chemistry, CBS Publication, New Delhi, 1987
8. Potter NH, Food Science, CBS Publication, New Delhi, 1998
9. Ramaswamy H and MarcottM, Food Processing Principles and Applications CRC Press, 2006
10. Ranganna S, Handbook of Analysis and Quality Control for Fruits and Vegetable Products, 2nded. TMH Education Pvt. Ltd, 1986


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Environmental Sciences
1st Semester; 1st Year of the Three–Year Degree Program
BFST-105

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Note: Eight questions are to be set covering entire syllabus. Students are required to attempt five question in all.

Unit 1: Multidisciplinary nature of environmental studies

Definition, scope and importance, need for public awareness.

Unit 2: Natural Resources:

Renewable and non-renewable resources: Natural resources and associated problems

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Unit 3: Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystems:-
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 4: Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India

- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 5: Environmental Pollution

Definition

- Cause, effects and control measures of:
 - a. Air pollution
 - b. Water pollution
 - c. Soil pollution
 - d. Marine pollution
 - e. Noise pollution
 - f. Thermal pollution
 - g. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and Industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

Unit 6: Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

Unit 7: Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.

- Case Studies.

Unit 8: Field work

- Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc.

Books recommended

- 1) Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- 2) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad –380 013, India, Email:mapin@icenet.net (R)
- 3) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- 4) Clark R.S., Marine Pollution, Clarendon Press Oxford (TB)
- 5) Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
- 6) De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- 7) Down to Earth, Centre for Science and Environment (R)
- 8) Gleick, H.P. 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- 9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- 10) Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- 11) Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- 12) Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- 13) Odum E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- 14) Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- 15) Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- 16) Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
- 17) Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
- 18) Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
- 19) Wanger K.D., 1998 Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p
- 20) Kaushik A and Kaushik C.P. Perspectives in Environmental studies. New Age International Publisher (TB)*


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Food Processing and Preservation
Ist Semester; 1st Year of the Three-Year Degree Program
BFST-107

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

To impart basic knowledge of:

- Freezing ,Dehydration processes and equipment
- Principles of thermal processing
- Technology of colloids
- Water disposal and sanitation
- Minimal Processing and hurdle technology

UNIT-I

Refrigeration and Freezing

Requirements of refrigerated storage - controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes during freezing
 Freezing methods -direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing.

Dehydration

Normal drying curve , effect of food properties on dehydration ,change in food during drying, drying methods and equipments air convection dryer, tray dryer, tunnel dryer ,continuous belt dryer , fluidized bed dryer, dryer, drum dryer, vacuum dryer ,freeze drying ,foam mat drying.

UNIT-II

Thermal Processing of Foods

Classification of thermal processes, Principles of thermal processing, commercial canning operations, Aseptic Processing, UHT. Irradiation and microwave heating Principles, Dosage, Applications of Irradiation, Mechanism of microwave heating and applications.

UNIT-III

Technology of Colloids in Food

Characteristics, sols, gels, pectin gels, colloidal sols, stabilization of colloidal system, syneresis, emulsions, properties of emulsions, formation of emulsion, emulsifying agents, food foams, formation stability and destruction of foam, application of colloidal chemistry to food preparation.

UNIT-IV

Food Additives, Contaminants and Regulations

Food Additives - Introduction, need of food additives in food processing and preservation, Characteristics and classification of food additives, Chemical, technological and toxicological aspects. Contamination in Food- : Physical, chemical (heavy metals, pesticide residues, antibiotics, veterinary drug residues, dioxins, environmental pollutants, radionucleides, solvent residues, chemicals) Natural toxins. Food Laws and Regulations- Codex, HACCP, ISO, FSSA

Recommended Readings:

1. Potter NH, 1998, Food Science, CBS Publication, New Delhi
2. Ramaswamy H and Marcotte M, 2009, Food Processing Principles and Applications CRC Press
3. Deman JM, 2007, Principles of Food Chemistry, 3rd ed. Springer
4. Manay NS and Shadaksharaswamy M, 1987, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

B.Sc. (Food Science & Technology)
COMPUTER APPLICATIONS
Ist Semester; 1st Year of the Three-Year Degree Program
BFST-109

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Unit I

Introduction to Computers: Introduction to Computer: Classification, Generations, Organization, Capabilities Characteristics & Limitations, Application of Computer in Hotels, Familiarization with Components of Computers – Hardware: Hardware elements – input, storage, processing & output devices. Block diagram of computer,

Unit II

Introduction to Computers Software: Types of Software, System Software, Application Software, Utility Software's, Use of MS- Office: Basics of MS- Word. MS-Excel and MS-Power Point

Unit III

Internet & Applications: Introduction to Internet: Definition of networks, concepts of web page, website and web searching (browsing). Benefits, Application, Working, Hardware and Software requirements, World Wide Web, Web Browser, URL, Search Engines, Email

Unit IV

Social Media Applications: Introduction to Social Media, Its Role in Promotion, Face book – Creating Pages and Profiles, Merits/Demerits of Social Media, Linked In, Twitter and Other Social Media Applications.

REFERENCES

1. Saxena, S. (2000), A first course in computers, vikas publishing house pvt Ltd., New Delhi.
2. Rajaraman, V (1999) Fundamentals of computers, printice hall India Pvt.Ltd., New Delhi.
3. Kirlinger., F.N, (1983) Fundamentals of behavioral research, Surjeeth publications, New Delhi.
4. Singh(1992) Techniques and methods of social survey research and statistic, prakasan Kendra publication, New Delhi
5. Shukla M.C. and Gulsha., Theory and practice, Sulthanchand and Co.,New Delhi


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FUNDAMENTALS OF FOOD TECHNOLOGY (PRACTICAL)
Ist Semester; 1st Year of the Three-Year Degree Program
BFST-101 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

1. Study different types of browning reactions: enzymatic and non enzymatic.
2. To study gelatinization behavior of various starches
3. To study the concept of gluten formation of various flours.
4. To study malting and germination.
5. To study dextrinization in foods.
6. Identification of pigments in fruits and vegetables and influence of pH on them.
7. Quality inspection of animal foods.

Recommended Readings

1. Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013
2. Roday,S. Food Science, Oxford publication, 2011.
3. B. Srilakshmi, Food science, New Age Publishers,2002
4. Meyer, Food Chemistry, New Age,2004
5. De Sukumar., Outlines of Dairy Technology, Oxford University Press, 2007


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Principles of Food Science (Practical)
Ist Semester; 1st Year of the Three-Year Degree Program
BFST-103 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

1. Estimation of reducing sugar by Fehlings procedure
2. Estimation of salt content in brine
3. Estimation of salt content in butter
4. Preparation of brix solution and checking by hand refractometer
5. Application of colloidal chemistry to food preparation
6. Demonstration of the Soxhlet method for determination of fat content
7. Determination of acidity of water
8. Determination of alkalinity/ hardness of water
9. Demonstration of the Kjeldahl's method for estimation of protein content


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

B.Sc. (Food Science & Technology)
COMPUTER APPLICATIONS(Practical)
Ist Semester; 1st Year of the Three–Year Degree Program
BFST-109 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

PRACTICAL

1. All relevant practical skills regarding usage of computers.
2. MS office and its component – word and its applications\creating documents – Edition spell check, auto correct and print preview, creating and storing data in tables, mail merge and its usage.
3. MS Excel for data analysis, work sheet and its structure data entry editing sorting filtering and copying. Graphs in excel various types of graphs, editing graphs, cut and copy operations.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

BFST SECOND SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-102	Technology of Food Preservation	3	-	40	60	100	3
	BFST-104	Food Processing Technology	3	-	40	60	100	3
	BFST-104 (Pr)	Food Processing Technology Practical	-	4	60	40	100	2
AECC	BFST-106	English Communication	3	-	40	60	100	3
DSE	BFST-108	Bakery Technology	3		40	60	100	3
	BFST-108 (Pr)	Bakery Technology Practical	-	4	60	40	100	2
	BFST-110	Food Safety, laws & regulation	3	-	40	60	100	3
SEC	BFST-112	Food Fermentation Technology Practical	-	4	60	40	100	2
		Total	15	12	380	420	800	21


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Technology of Food Preservation
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-102

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

To study the importance microorganisms in food preservation
 To introduce the basics of various food processing and preservation technologies

UNIT 1

Food Microbiology: Principles of Food Preservation, microorganisms associated with foods- bacteria, yeast and mold, Importance of bacteria, yeast and molds in foods. Classification of microorganisms based on temperature, pH, water activity, nutrient and oxygen requirements, typical growth curve of micro-organisms.

UNIT II

Classification of food based on pH, Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, and shelf stable foods.

Food Preservation: Freezing and Refrigeration- Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food.

UNIT-III

Thermal Processing- Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching.

Food Preservation by Drying and Dehydration - Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry.

UNIT-IV

Food Preservation by Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry.

Food Preservation by Irradiation: Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization.

Recommended Readings

1. B. Srilakshmi, Food science, New Age Publishers, 2002
2. Meyer, Food Chemistry, New Age, 2004
3. Bawa. A.S, O.P Chauhan et al. Food Science. New India Publishing agency, 2013
4. Frazier WC and Westho ff DC, Food Microbiology, TMH Publication, New Delhi, 2004


Principal
 Principal
 MMCT & SM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Food Processing Technology
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-104

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

To impart basic knowledge of:

1. Cold Preservation and freezers
2. Dehydration
3. Irradiation
4. Food Packaging
5. Thermal Processing

UNIT-I

FOOD PROCESSING OPERATIONS:

Cold preservation: Freezing: requirements of refrigerated storage - controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes during freezing –concentration effect and ice crystal damage, freezer burn. Refrigeration load, factors determining freezing rate-food composition and non compositional influences

Freezing- Mechanism and freezers: Freezing methods -direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing.

UNIT II

FOOD PROCESSING OPERATIONS:

Dehydration: Normal drying curve , effect of food properties on dehydration , change in food during drying ,drying methods and equipments air convection dryer, tray dryer, tunnel dryer, continuous belt dryer , fluidized bed dryer, spray dryer, drum dryer, vacuum dryer, freeze drying, foam mat drying.

Food Irradiation and Microwave Heating: Ionizing radiation and sources, unit of radiations, direct and indirect radiation effects, safety and wholesomeness of irradiated food. Microwave heating and application.

UNIT III

Packaging of foods: Packaging: Properties of packaging material, factors determining the packaging requirements of various foods and brief description of packaging of frozen products, dried products, fats and oils and thermally processed foods

Material handling: Elementary concept of material handling in food industry, equipment and functioning of belt conveyor, screw conveyor, bucket elevator and pneumatic conveyor.

UNIT IV

Thermal processing: Introduction, classification of Thermal Processes, Principles of thermal processing, Thermal resistance of microorganisms, Thermal Death Time, Lethality concept, characterization of heat penetration data, Thermal process Calculations

Separation processes: Principles and methods of: distillation, extraction, washing, filtration, sedimentation, sieving and centrifugation

Recommended Readings

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi- 1992
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998
4. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
5. Rao PG, Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi, 2010
6. Toledo Romeo T, Fundamentals of Food Process Engineering, Aspen Publishers, 1999


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

B.Sc. (Food Science & Technology)
English Communication
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-106

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

UNIT-I

Basic Concepts in Communication: Communication as sharing; context of communication; the speaker/writer and the listener/reader; medium of communication; barriers to communication; accuracy, brevity, clarity and appropriateness in communication.

UNIT II

Writing Skills: Types of writings (Expository, Descriptive, Analytic, Argumentative, Narrative etc) and their main features. Resumes and CV's and Cover letters. Memos and Notices. Basics of Formal Reports

UNIT III

Verbal, Non-Verbal and Listening Skills: Elementary Phonetics (Speech Mechanism, The Description of Speech Sounds, The Phoneme, the syllable; Prosodic Features, Word Accent, Features of Connected Speech); Paralanguage and Body language; and Classroom Presentations, Hearing and Listening; Essentials of Good Listening: Achieving ability to comprehend material delivered at relatively fast speed.

UNIT IV

Group Discussion: Use of persuasive strategies including some rhetorical devices for emphasizing (for instance; being polite and firm; handling questions and taking in criticism of self; turn-taking strategies and effective intervention; use of body language).

Text and Reference Books:

- Developing Communication Skills. Krishna Mohan & Meera Banerji. Macmillan India Limited, 1998..

- Speaking English Effectively. Krishna Mohan & N.P.Singh. Macmillan India Limited, Delhi,1997
- Business Communication Today. Bovee, Courtland, L. and John, V. Thill.1995. 4th Ed. New York. McGraw Hill Inc..
- Communicating for future business professionals. Greene Michael and Jonathen G Ripley. Prentice Hall Inc.



Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

B.Sc. (Food Science & Technology)
BAKERY & CONFECTIONARY TECHNOLOGY
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-108

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To understand the fundamentals of baking
- To learn the technologies behind bakery products.
- To understand industry trends

UNIT-I

BAKERY INDUSTRY: Raw materials for bakery products: flour, sugar, shortening, yeast, salt etc as raw material for bakery products, their role and PFA specifications of these raw materials. Status of bakery industry in India

BREAD, BUNS AND PIZZA BASE: Ingredients & processes for breads, buns, pizza base, Equipments used, product quality characteristics, faults and corrective measures

UNIT II

CAKES: Ingredients & processes for cakes, Equipments used, product quality characteristics, faults and corrective measures. Different types of icings.

MODIFIED BAKERY PRODUCTS: Modification of bakery products for people with special nutritional requirements e.g. high fibre, low sugar, low fat, gluten free bakery products.

UNIT III

BISCUITS, COOKIES & CRACKERS: Ingredients & processes, Equipments used, product quality characteristics, faults and corrective measures.

UNIT IV

BREAKFAST CEREALS, MACARONI PRODUCTS AND MALT: Production and quality of breakfast cereals, macaroni products and malt.

Recommended Readings

1. Dubey, S.C. (2007). Basic Baking 5th Ed. Chanakya Mudrak Pvt. Ltd.
2. Raina et.al. (2003). Basic Food Preparation-A complete Manual. 3rd Ed. Orient Longman Pvt. Ltd.
3. Manay, S. & Shadaksharaswami, M. (2004). Foods: Facts and Principles, New Age Publishers.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
Food Safety, Law and Regulations
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-110

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Section – A

Introduction, concept of food safety and quality. Responsibility of food safety. Food hazards and contaminations. **Biological** (bacteria, viruses and parasites), **Chemical** (toxic constituents / hazardous materials) pesticides residues / environmental pollution / chemicals) and **Physical factors**. Concept of Obligatory system for food Health and safety viz. **GMP, GHP, GLP and HACCP** in a food industry.

Section – B

Food allergen, Natural occurring toxins, pesticides, Food additives, Preventive food safety systems – monitoring of safety, wholesomeness and nutritional quality of food. The role of food preservation in food safety. Prevention and control of microbiological and chemical hazards.

Section – C

Issues in foods safety, Food safety inspection service (FSIS) and their utilization. Food safety aspects of novel methods of food processing such as Pulse electric field (PEF), high pressure processing (HPP), thermal and non-thermal processing, irradiation of foods.

Section – D

HACCP system of food protection: Principles of HACCP and their applications. Benefits from implementing a HACCP system, and their role in food safety system. A case study of HACCP implementation in food industry.

Food laws and regulations in food safety; Food safety regulations and standards. PFA, MMPO, Food safety act, Codex Alimentarius Commission, food laws.


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD FERMENTATION TECHNOLOGY
(CREDITS: PRACTICAL - 2)
2nd Semester; 1st Year of the Three–Year Degree Program
BFST- 112

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

Objectives:

- To understand the principles of food fermentation technology
- To study the types of starters used in Food Industry
- To study the production of various fermented food

1. Food Fermentation Technologies.
2. Study of a Bio fermentor – its design and operation, Down Stream Processing and Product recovery.
3. Starter cultures.
4. Production of Baker’s Yeast
5. Production of yoghurt using DIV cultures
6. Development of a fermented food/drink utilizing plant products /animal products or byproducts as substrate

Recommended Readings:

1. Food Microbiology. 2nd Edition By Adams M & Moss, M. 2008. RSC Publishing.
2. Biotechnology: Food Fermentation Microbiology, Biochemistry and Technology. Volume 2 by Joshi V. K. & Pandey, A., Sanjanya Books 1999.
3. Essentials of Food Microbiology. Edited by John Garbutt. Arnold International Students Edition. 1997
4. Microbiology of Fermented Foods. Volume II and I. By Brian J. Wood. Elsevier Applied Science Publication. 1997
5. Principles of Fermentation Technology by Stanbury, P.F., Whitekar A. and Hall. 1995., Pergaman. McNeul and Harvey. (AC) NEW


Principal
 Principal
 MMCT & SM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD PROCESSING TECHNOLOGY (PRACTICAL)
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-114

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

PRACTICAL

1. Comparison of conventional and microwave processing of food
2. Preservation of food by the process of freezing
3. Drying of food using Tray dryer/other dryers
4. Preservation of food by canning(Fruit/Vegetable/meat)
5. Cut-out analysis of canned food
6. Osmotic dehydration
7. Minimal Processing
8. Testing of Packaging material

Recommended Readings

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi- 1992
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998
4. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
5. Rao PG, Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi, 2010
6. Toledo Romeo T, Fundamentals of Food Process Engineering, Aspen Publishers, 1999


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
BAKERY TECHNOLOGY (PRACTICAL)
2nd Semester; 1st Year of the Three-Year Degree Program
BFST-116

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

PRACTICAL

List of Experiments :

1. Quality analysis of raw materials used in Bakery and confectionery industry according of PFA standards, Preparation and evaluation of Bakery and Confectionery products:
2. Bread : White Sandwich; High volume milk bread, using different methods
3. Cakes: with eggs; without eggs, ;using different methods
4. Biscuits: using different methods, Buns, Pizza
5. Study and analysis of the production charts used for different products by bakery industries, visits to Bakery and Confectionery industry, Local market survey for Bakery and confectionery products.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

3rd Semester (2nd Year, Course: B. Sc. Food Science and Technology) 4+2

BFST THIRD SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-201	Food and Nutrition	3	-	40	60	100	3
	BFST-201 (Pr)	Food and Nutrition Practical	-	4	60	40	100	2
	BFST-203	Technology of Fruits, Vegetables and Plantation Crops	3	-	40	60	100	3
	BFST-203 (Pr)	Technology of Fruits, Vegetables and Plantation Crops Practical	-	4	60	40	100	2
	BFST-205	Milk & Milk Products Technology	3	-	40	60	100	3
SEC	BFST-207	Entrepreneurship Development	3	-	40	60	100	3
GE	BFST-209	Food engg. & Packaging	3	-	40	60	100	3
DSE	BFST-211	Food hygiene & Sanitation	3	-	40	60	100	3
		Total	18	8	360	440	800	22


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Food and Nutrition
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST-201

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

This course will enable the student to:

- Understand the relationship between food, nutrition and health.
- Understand the functions of food.
- Learn about various food groups and balanced diet.
- Understand digestion, absorption and function of various nutrients and their sources.

UNIT 1

Introduction to food and nutrition: Basic terms used in study of food and nutrition, BMI and Nutritional Status, Understanding relationship between food, nutrition and health.

Balanced Diet: Functions of food-physiological, psychological and social, Concept of Balanced Diet, Food Groups, Food Pyramid.

UNIT II

Nutrients: Classification, digestion, functions, dietary sources, RDA, clinical manifestations of deficiency and excess and factors affecting absorption of the following in brief:

- Energy
- Carbohydrates, lipids and proteins
- Fat soluble vitamins-A, D, E and K

UNIT-III

Nutrients: Classification, digestion, functions, dietary sources, RDA, clinical manifestations of deficiency and excess and factors affecting absorption of the following in brief:

- Water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin C
- Minerals – major and minor

UNIT-IV

Concepts of Meal Planning – Factors affecting meal planning, understanding specific considerations for planning meal for different groups of people.

Methods of Cooking - Dry, moist, frying and microwave cooking, Advantages, disadvantages and the effect of various methods of cooking on foods.

Nutritional Labeling - Importance, global trends, codex guidelines, nutritional labelling in India, FSSAI guidelines.

Recommended Readings

1. Bamji MS, Krishnaswamy K, Brahmam GNV (2009). Textbook of Human Nutrition, 3rd Edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Srilakshmi (2007). Food Science, 4th Edition. New Age International Ltd.
3. Srilakshmi,(2005), Dietetics, Revised 5th edition. New Age International Ltd.
4. Wardlaw MG, Paul M Insel Mosby 1996). Perspectives in Nutrition, Third Edition.
5. Codex Guidelines on Nutrition Labelling (CAC/GL 2_1985) (Rev.1_1993). Rome, Food and Agriculture Organisation of the United Nations / World Health Organisation, 1993.
6. Food Safety and Standards Authority of India portal, Government of India
7. Gopalan, C., (1990). NIN, ICMR. Nutritive Value of Indian Foods.
8. Seth V, Singh K (2005). Diet planning through the Life Cycle: Part 1. Normal Nutrition. A Practical Manual, Fourth edition, Elite Publishing House Pvt Ltd.


Principal
Principal
MMICT & BMS (Hotel Management)
Maharishi Merikandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Technology of Fruits, Vegetables and Plantation
Crops
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST-203

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

To impart basic knowledge of:

1. To impart knowledge of different methods of fruits and vegetable processing.
2. To learn about processing of various spices, tea, coffee and cocoa.

UNIT-I

TECHNOLOGY OF FRUITS AND VEGETABLES: Introduction, Importance of fruits and vegetable, history and need of preservation, reasons of spoilage, method of preservation (short & long term)

CANNING AND BOTTLING OF FRUITS AND VEGETABLES: Selection of fruits and vegetables, process of canning, factors affecting the process- time and temperature, containers of packing, lacquering, syrups and brines for canning, spoilage in canned foods.

UNIT II

FRUITS BEVERAGES: Introduction, Processing of fruit juices (selection, juice extraction, deaeration, straining, filtration and clarification), preservation of fruit juices (pasteurization, chemically preserved with sugars, freezing, drying, tetra-packing, carbonation), processing of squashes, cordials, nectars, concentrates and powder.

UNIT III

JAMS, JELLIES AND MARMALADES: Introduction, Jam: Constituents, selection of fruits, processing & technology, Jelly: Essential constituents(Role of pectin, ratio), Theory of jelly formation, Processing & technology, defects in jelly, Marmalade : Types, processing & technology, defects.

PICKLES, CHUTNEYS AND SAUCES: Processing , Types, Causes of spoilage in pickling.

UNIT IV

TOMATO PRODUCTS: Selection of tomatoes, pulping& processing of tomato juice, tomato puree, paste, ketchup, sauce and soup.

DEHYDRATION OF FOODS AND VEGETABLES: Sun drying & mechanical dehydration, process variation for fruits and vegetables, packing and storage.

SPICES: Processing and properties of major and minor spices, essential oils & oleoresins, adulteration.

TEA, COFFEE AND COCOA: Processing, Variety and Products.

Recommended Readings

1. Girdharilal, Siddappaa, G.S and Tandon, G.L.1998. Preservation of fruits & Vegetables, ICAR, New Delhi
2. W B Crusess.2004. Commercial Unit and Vegetable Products, W.V. Special Indian Edition, Pub: Agrobios India
3. Manay, S. &Shadaksharaswami, M.2004. Foods: Facts and Principles, New Age Publishers
4. Ranganna S.1986. Handbook of analysis and quality control for fruits and vegetable products, Tata McGraw-Hill publishing company limited, Second edition.
5. Srivastava, R.P. and Kumar, S. 2006 . Fruits and Vegetables Preservation- Principles and Practices. 3rd Ed. International Book Distributing Co.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

B.Sc. (Food Science & Technology)
MILK & MILK PRODUCTS TECHNOLOGY
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST- 205

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To know the need and importance of dairy industry
- To know the compositional and technological aspects of milk.
- To study processed milk and milk products

UNIT-I

Milk: Definition, milk types, composition, nutritive value of milk and milk products. **Milk properties:** Physical, chemical and thermal properties like density, acidity, redox potential, specific gravity, thermal conductivity, etc.

UNIT – II

Milk processing: Reception, pasteurization, homogenization, sterilization, cream separation, principles, mechanism and equipment, energy requirements. **Evaporated and concentrated milks:** Water and solid balance, boiling point elevation, pressure-temperature relationships, falling and rising film evaporators, thermo compressors, steam economy

UNIT – III

Dried milks: Dried whole milk, Dried non-fat milk/SMP, Drying methods, spray drying, efficiency and energy consumption, cyclone separation, fluidized bed drying. **Cultured milk and milk products:** Types, manufacturing process and technology involved.

UNIT – IV

Other milk products: Butter, cheese, cream, ice-cream-manufacturing process and technology involved. Utilisation of dairy industry by-products. **Cleaning and disinfections in a dairy industry:** Terms, definitions, cleaning and disinfection agents and processes

Books Recommended:

1. Vaclavik V.A. and Christian E.W. (2003) Essentials of food science. 2nd edition Springer International.
2. Spreer E. (1998) Milk and dairy product technology. Marcel Dekker Inc.
3. Smit G. (2003) Dairy processing- improving quality. Woodhead Publishing.
4. Hohnson M. and Alford (1987) Fundamentals of dairy chemistry. 2nd edition. CBS Publishers.


Principal
 MMCT & SM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
Entrepreneurship Development
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST- 207

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

UNIT 1

INTRODUCTION: Meaning, Needs and Importance of Entrepreneurship, Promotion of entrepreneurship, Factors influencing entrepreneurship, Features of a successful Entrepreneurship.

UNIT II

ESTABLISHING AN ENTERPRISE: Forms of Business Organization, Project Identification, Selection of the product, Project formulation, Assessment of project feasibility.

UNIT III

FINANCING THE ENTERPRISE: Importance of finance / loans and repayments, Characteristics of Business finance, Fixed capital management: Sources of fixed capital, working capital its sources and how to move for loans, Inventory direct and indirect raw materials and its management.

UNIT IV

MARKETING MANAGEMENT: Meaning and Importance, Marketing-mix, product management – Product line, Product mix, stages of product like cycle, marketing Research and Importance of survey, Physical Distribution and Stock Management.

Recommended Readings:

1	Entrepreneurship Development	G.P.Prasain (Ed.)	2003
2	Entrepreneurship Development	S. Anil Kumar	1st Edition, 2003
3	Entrepreneurship Development	Dr. K.C. Sharma with a Foreword by Prof. J.N. Sharma	2012
4	Entrepreneurship Development - Programmes and Practices	J.S.Saini	2000, re-print 2003

5	Entrepreneurship Development and Management	Dr. A. K. Singh	1st edition, 2006
6	Entrepreneurship Development and Small Business Enterprises	Poornima M. Charantimath	2009
7	Entrepreneurship Development and Management	Dr. A. K. Singh	Second Edition, 2009
8	ENTREPRENEURSHIP DEVELOPMENT (ORIGINALS)	RAMACHANDRAN, K	1st Edition
9	Development of Rural Women Entrepreneurship	Dr. Gyanmudra	2013
10	Developmental Aspects of Entrepreneurship	SHIVGANESH BHARGAVA (Ed.)	2007
11	Entrepreneurship & Employment - Strategies For Human Resource Development	Dr. S.B.Verma	2004
12	Rural Entrepreneurship Development in Liberalised Era	Amit Kumar Dwivedi, Anita Sukhwai (Eds.)	2012
13	Entrepreneurship Development in India	Bishwanath Ghosh	2000
14	Entrepreneur Development - New Venture Creation	SatishTaneja&S.L.Gupta	2nd edition, 2005
15	Development of Entrepreneurship	Dr. G.S.Batra	2002, re-print, 2003
16	Entrepreneurship Development and Small Business Enterprises	Poornima M. Charantimath	2006
17	Entrepreneurship and Small Business Development	KiranSankarChakraborty	2006
18	Entrepreneurship Development and Small Business Enterprises	Poornima M. Charantimath	2009


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
Food Engineering and Packaging
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST- 209

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To understand the principles of Unit operation
- To acquaint with fundamentals of food engineering and its process
- To develop an understanding of different food packaging materials and packaging design and techniques used for various foods

UNIT-I

Unit Operations and Processes: Introduction, Units and Dimensions, Heat Transfer- Conduction, Convection and Radiation, Mass transfer-Diffusion, membrane separation processes, Steam generation and Boilers, Evaporation

UNIT-II

Unit Operations and Processes: Drying and dehydration, Refrigeration, Freezing, Psychometrics and Fluid flow.

Separation and Size Reduction Processes: Principles and equipments used in separation Extraction, sedimentation, filtration, centrifugation, Size reduction – Milling, grinding and mixing of foods

UNIT-III

Introduction to Food Packaging: Objectives and functions of food packaging, Requirements for effective food packaging, Types of packaging Materials, General properties of packaging materials

UNIT-IV

Packaging of Foods: Packaging of fresh produce and processed foods, Aseptic packaging, Advances in food packaging

Recommended Readings:

- 1.Paine FA and Paine HY, 1992 A Handbook of Food Packaging, Blackie Academic Professional,
- 2.Rao CG. 2006, Essentials of food process engineering. B S publications
- 3.Rao DG, 2010, Fundamentals of food engineering. PHI learning private Ltd.
- 4.Robertson GL, 2012, Food Packaging – Principles and Practice, CRC Press Taylor and Francis Group
- 5.Singh RP and Heldman DR, 1993, 2003, 2009, 2nd, 3rd and 4th Ed., Introduction to food engineering. Academic press.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD HYGIENE & SANITATION
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST-211

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Section – A

Principles of Food Hygiene: hygiene in urban and rural areas with respect to food preparations.
Good Manufacturing Practices(GMP &cGMP): Plant and equipments design, requirements for ease in maintenance of hygiene and sanitation Food handling habits and personal hygiene,
Water: Sources of water and impurities in water, hardness of water. Water supply systems and water purification, chlorination

Section – B

Types of Soil (Food residues on equipment surfaces) and its properties. **Cleaning procedure:** types of cleaning agents and their properties. Acid and alkaline cleaners. Types of sanitizing agents and their properties.

Section – C

Sanitizers: Chlorine, iodine and their compounds as sanitizers, Quaternary ammonium compounds, phenolic compounds as sanitizers. Advantages and disadvantages of these sanitizers. Physical sanitizing agents: Hot water, Steam and UV light. Sanitation facilities and procedures in food plant operations. **CIP (Clean –in-place);** system in a food industry. CIP monitoring and validation.

Section – D

Cleaning Premises and Surroundings: Sanitation regulations, phytosanitary requirements. Hygiene and sanitation of preparation, storage and retail shops. **Pest Management:** Common Pests in food services rodents, insects, birds, house flies, cockroaches, ants and their control. Study of food sanitation checks lists.

Books Recommended:

- 1 Guide to improving Food Hygiene - Ed Gaston & Tiffney
- 2 Practical Food Microbiology and - Harry H.Weiser,J.mountney andW.W.Gord Technology (2nd edition)


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
Food and Nutrition Practical
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST-201 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2

L	T	P	Cr
-	-	4	2.0

PRACTICAL

1. Identification of food sources for various nutrients using food composition tables.
2. Record diet of self using 24 hour dietary recall and its nutritional analysis.
3. Introduction to meal planning, concept of food exchange system.
4. Planning of nutritious snacks for different ages
5. Preparation of nutritious snacks using various methods of cooking.
6. Nutritional labeling of food products.
7. Estimation of BMI and other nutritional status parameters.

Recommended Readings

1. Bamji MS, Krishnaswamy K, Brahmam GNV (2009). Textbook of Human Nutrition, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Srilakshmi (2007). Food Science, 4th Edition. New Age International Ltd.
3. Wardlaw MG, Paul M Insel Mosby 1996). Perspectives in Nutrition, Third Edition.
4. Introduction to Human Nutrition ed. Gibney et al, Blackwell Publishers, 2005
5. Khanna K, Gupta S, Seth R, Mahna R, Rekhi T (2004). The Art and Science of Cooking: A Practical Manual, Revised Edition. Elite Publishing House Pvt Ltd.
6. NIN, ICMR (1990). Nutritive Value of Indian Foods.
7. Seth V, Singh K (2005). Diet planning through the Life Cycle: Part 1. Normal Nutrition. A Practical Manual, Fourth edition, Elite Publishing House Pvt Ltd.
8. ICMR (2010). Nutrient Requirements and Recommended Dietary Allowances for Indians.


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
TECHNOLOGY OF FRUITS, VEGETABLES AND PLANTATION CROPS
(PRACTICAL)
3rd Semester; 2nd Year of the Three-Year Degree Program
BFST- 203 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

PRACTICAL

1. Estimation of total soluble solids (TSS).
2. Estimation of pH and acidity of products.
3. Estimation of brix: acidity ratio
4. Estimation of ascorbic acid and effect of heat treatment on it.
5. To study the steps of can making process.
6. Preparation and evaluation of pectin products.
7. Adulteration of spices.
8. Dehydration of fruits and vegetables.
9. Rehydration of fruits and vegetables.

Recommended Readings

1. Girdharilal, Siddappaa, G.S and Tandon, G.L.1998. Preservation of fruits & Vegetables, ICAR, New Delhi
2. W B Crusess.2004. Commercial Unit and Vegetable Products, W.V. Special Indian Edition, Pub: Agrobios India
3. Manay, S. &Shadaksharaswami, M.2004. Foods: Facts and Principles, New Age Publishers
4. Ranganna S.1986. Handbook of analysis and quality control for fruits and vegetable products, Tata McGraw-Hill publishing company limited, Second edition.
5. Srivastava, R.P. and Kumar, S. 2006 . Fruits and Vegetables Preservation- Principles and Practices. 3rd Ed. International Book Distributing Co.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

BFST FOURTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-202	Technology of Cereals, Pulses and Oilseeds	3	-	40	60	100	3
	BFST-202 (Pr)	Technology of Cereals, Pulses and Oilseeds Practical		4	60	40	100	2
	BFST-204	Food Microbiology	3	-	40	60	100	3
	BFST-204 (Pr)	Food Microbiology Practical		4	60	40	100	2
	BFST-206	Technology of Meat, fish and Poultry	3	-	40	60	100	3
GE	BFST-208	Food Quality and Sensory Evaluation	3	-	40	60	100	3
	BFST-208 (Pr)	Food Quality and Sensory Evaluation Practical	-	4	60	40	100	2
DSE	BFST-210	BEVERAGE TECHNOLOGY	3	-	40	60	100	3
	BFST-218	A Case Study of an organization	2	-	100	-	100	1
		Total	17	12	380	420	900	22


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
TECHNOLOGY OF CEREALS, PULSES AND OILSEEDS
4th Semester; 2nd Year of the Three-Year Degree Program
BFST-202

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

This course will enable the student to:

- To teach technology of milling of various cereals
- To impart technical knowhow of pulses and oilseeds refining

UNIT 1

TECHNOLOGY OF CEREALS: Introduction

Wheat --Types, milling, flour grade, flour treatments (bleaching, maturing), flour for various purposes, Products and By-products.

Rice – Physicochemical properties, milling (mechanical & solvent extraction), parboiling, ageing of rice, utilization of by products.

Corn – Milling (wet & dry), cornflakes, corn flour

UNIT II

TECHNOLOGY OF CEREALS:

Barley- Milling (pearl barley, barley flakes & flour)

Oats – Milling (oatmeal, oatflour & oatflakes)

Sorghum and millets – Traditional & commercial milling (dry & wet)

Rye and triticale—milling (flour), uses

UNIT-III

TECHNOLOGY OF PULSES: Milling of pulses, Dry milling, Wet milling, Improved milling methods

TECHNOLOGY OF OILSEEDS: Introduction, Extraction of oil and refining, Sources of protein (defatted flour, protein concentrates and isolates), properties and uses, protein texturization, fibre spinning

UNIT-IV

ALCOHOLIC BEVERAGES: Beer, Wine, and other major alcoholic beverages, Distilled Spirits

Recommended Readings

1. Kent, N.L. 2003. Technology of Cereal, 5th Ed. Pergamon Press.
2. Chakraverty. 1988. Post Harvest Technology of Cereals, Pulses and Oilseeds, revised Ed., Oxford & IBH Publishing Co. Pvt Ltd.
3. Marshall, Rice Science and Technology. 1994. Wadsworth Ed., Marcel Dekker, New York.
4. Manay, S. and Sharaswamy, M. 1987. Food Facts and Principles. Wiley Eastern Limited.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD MICROBIOLOGY
4th Semester; 2nd Year of the Three-Year Degree Program
BFST- 204

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

To know the important genera of microorganisms associated with food and their characteristics.
 To understand the role of microbes in fermentation, spoilage and food borne diseases.

UNIT-I

Introduction to Food Microbiology: History and Development of Food Microbiology, Definition and Scope of food microbiology, Inter-relationship of microbiology with other sciences

Characteristics of Microorganisms in Food: Types of microorganisms associated with food, their morphology and structure, Significance of spores in food microbiology

Microbial Growth in Food: Bacterial growth curve and microbial growth in food, Factors affecting the growth of micro organisms in food

UNIT II

Microbial Food Spoilage: Sources of Microorganisms in foods, Some important food spoilage microorganisms, Spoilage of specific food groups- Milk and dairy products, Meat, poultry and seafoods, Cereal and cereal products, Fruits and vegetables and Canned products

Food Fermentation: Fermentation –definition and types, Microorganisms used in food fermentations

UNIT III

Food Fermentation: Dairy Fermentations-starter cultures and their types, concept of probiotics, Fermented Foods-types, methods of manufacture for vinegar, sauerkraut, tempeh, miso, soya sauce, beer, wine and traditional Indian foods

Foodborne Diseases: Types – foodborne infections, foodborne intoxications and toxoinfections

Foodborne Diseases: Common and Recent Examples

Cultivation of Micro-organisms: Pure culture technique, Methods of isolation and cultivation, Enumeration of Microorganisms- qualitative and quantitative

UNIT IV

Control of Microorganisms in Foods: Principles and methods of preservation, Physical Methods of Food Preservation- Dehydration, Freezing, Cool Storage, Heat Treatment (esp. thermobacteriology), Irradiation, Biopreservatives esp. Bacteriocins, Introduction to Hurdle concept and Non Thermal methods

Trends in Food Microbiology: Rapid Methods of Detection, Recent Advances

Recommended Readings

- 1) Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
- 2) Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- 3) Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
- 4) Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993



Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
TECHNOLOGY OF MEAT, FISH AND POULTRY
4th Semester; 2nd Year of the Three-Year Degree Program
BFST- 206

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To understand need and importance of livestock, egg and poultry industry
- To study structure, composition and nutritional quality of animal products.
- To study processing and preservation of animal foods.
- To understand technology behind preparation of various animal food products and byproduct utilization.

UNIT-I

Introduction: - Scope of meat industry in India. Structure composition, nutritive value and post mortem biochemical changes in relation to quality of fish and meat tissues.

Meat Processing - Antemortem inspection & grading, stunning & slaughtering of cattle, buffalo, sheep, goat, and pigs and their dressing, post- mortem inspection. **Quality factor in meats.** Factor affecting quality of fresh & cured meats. Meat tenderizations

UNIT II

Meat Preservation:- principles of meat Preservation, Preservation by curing, smoking, canning, freezing, dehydration, chemicals & antibiotics.

thermal processing- canning of meat, retort pouch, dehydration, irradiation, and RTE meat products, meat curing. Sausages-processing, types and defects

By-products: Importance, classification and uses, Manufacture of Natural casings

UNIT III

Fish processing & Preservation:- Quality control of fresh fish and fish products.

Preservation of fish by salting, smoking, dehydration, canning, and freezing.

Fish Products :- Selection of raw material for processing of streaking and filleting of fish. Production of fish paste, fish oil, sause, pickle, and other products such as fish protein concentrates, fish meal.

UNIT IV

Handling & Dressing of poultry:- Inspection of poultry birds, dressing and preparation of ready to cook poultry, factors affecting quality.

Egg & Egg Products :- Structure, chemical composition, nutritive value, spoilage, preservation of whole egg and egg products preparation of egg powder.

Recommended Readings

- 1) Lawrie R A, Lawrie's Meat Science, 5th Ed, Woodhead Publisher, England, 1998
- 2) Parkhurst & Mountney, Poultry Meat and Egg Production, CBS Publication, New Delhi, 1997
- 3) Pearson & Gillet Processed Meats, 3 Ed, CBS Publication, New Delhi, 1997
- 4) Shai Barbut, Poultry Products Processing, CRC Press 2005


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
Food Quality and Sensory Evaluation
4th Semester; 2nd Year of the Three-Year Degree Program
BFST- 208

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

UNIT-I

Introduction to quality attributes of food: Appearance, flavour, textural factors and additional quality factors.

Gustation: Introduction and importance of gustation, Structure and physiology of taste organs-tongue, papillae, taste buds, salivary glands. Mechanism of taste perception, Chemical dimensions of basic tastes- sweet, salt, sour, bitter and umami. Factors affecting taste quality, reaction time, taste modification, absolute and recognition threshold. Taste measurement-Electronic Tongue, Taste abnormalities

UNIT II

Olfaction: Introduction, definition and importance of odour and flavor, Anatomy of nose, physiology of odour perception, Mechanism of odour perception, Theories of odour classification, chemical specificity of odour. Odour measurement techniques – historical perspective and emphasis on recent techniques- e- nose etc. Olfactory abnormalities

UNIT III

Colour: Introduction and importance of colour, Dimensions of colour and attributes of colour; gloss etc. Perception of colour. Colour Measurement: Munsell colour system, CIE colour system, Hunter colour system, Colour abnormalities

UNIT IV

Texture: Introduction, definition and importance of texture, Phases of oral processing, Texture perception, receptors involved in texture perception, Rheology of foods, Texture classification, Texture measurement – basic rheological models, forces involved in texture measurement and recent advances in texture evaluation. Application of texture measurement in cereals, fruits and vegetables, dairy, meat and meat products

Recommended Readings:

1. Rao E. S. (2013). Food Quality Evaluation, Variety Books.
2. Amerine, Pangborn & Roessler (1965). Principles of Sensory Evaluation of food, Academic Press, London.
3. Meilgard (1999). Sensory Evaluation Techniques, 3rd ed. CRC Press LLC, 1999
4. deMan J. (2007). Principles of Food Chemistry, 3rd ed., Springer. 62
5. Brannen and et al.,(1990)Food Additives, Marcel Dekker,New York,19

B.Sc. (Food Science & Technology)
BEVERAGE TECHNOLOGY
4th Semester; 2nd Year of the Three-Year Degree Program
BFST-210

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Section – A

Beverage Processing – Definition, Origin and Scope as human foods. Quality of water for beverage industry and its importance.

Processing of alcoholic beverage (beer, wine, brandy etc.) and factors that affect the quality of such beverages. Analysis and evaluation of quality parameters of alcoholic beverages.

Section – B

Processing of Non-Alcoholic Beverages (fruit juices and other drinks). Analysis and evaluation of quality parameters of non-alcoholic beverages. Processing of carbonated and non-carbonated beverages. Technology and application of carbonation processes for beverage industries.

Processing of alcoholic drinks: Processing and technology. Fermentation, Distillation, Filtration, Ageing of Beer, Wine, Whisky, Vodka, Rum, Champagne. **Processing of health and energy drinks:** baby drink, sports personals, space utilization, defense personal, etc.

Section – C

Processing of Tea – various types of tea, tea concentrates, tea fermentation processes, decaffeination process.

Section – D

Processing of Coffee: type of coffee, drying, fermentation, roasting and browning processes and their importance. **Analysis:** tea and coffee quality components, standards and specification of tea and coffee products.

Books Recommended:

1. Woordroof & Phillips: Beverages, AVI Publication, USA.
2. Wingham, D.A.: Coffee & Tea, Interscience Publication, USA.
3. Ranganna: Handbook of Analysis of Fruit and Vegetable Products.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
TECHNOLOGY OF CEREALS, PULSES AND OILSEEDS PRACTICAL
4th Semester; 2nd Year of the Three-Year Degree Program
BFST-212

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

PRACTICAL

1. Physical characteristics of Wheat
2. Estimation of Gluten Content of flour
3. Estimation of Pelenske Value of flour
4. Estimation of Potassium Bromate in flour
5. Fermenting power of yeast
6. Physical Characteristics of Rice and paddy
7. Cooking characteristics of rice
8. Determination of sedimentation power of flour

Recommended Readings

1. Kent, N.L. 2003. Technology of Cereal, 5th Ed. Pergamon Press.
2. Chakraverty. 1988. Post Harvest Technology of Cereals, Pulses and Oilseeds, revised Ed., Oxford & IBH Publishing Co. Pvt Ltd.
3. Marshall, Rice Science and Technology. 1994. Wadsworth Ed., Marcel Dekker, New York.
4. Manay, S. and Sharaswamy, M. 1987. Food Facts and Principles. Wiley Eastern Limited.


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD MICROBIOLOGY PRACTICAL
4th Semester; 2nd Year of the Three-Year Degree Program
BFST- 214

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	P	Cr
-	4	2.0

PRACTICAL

1. Introduction to the Basic Microbiology Laboratory Practises and Equipments
2. Fuctioning and use of compound microscope
3. Cleaning and sterilization of glassware
4. Preparation and sterilization of nutrient broth
5. Cultivation and sub-culturing of microbes
6. Preparation of slant, stab and plates using nutrient agar
7. Morphological study of bacteria and fungi using permanent slides
8. Simple staining
9. Gram's staining
10. Standard Plate Count Method

Recommended Readings

- 1) Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
- 2) Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- 3) Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
- 4) Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD QUALITY AND SENSORY EVALUATION PRACTICAL
4th Semester; 2nd Year of the Three-Year Degree Program
BFST-216

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	T	P	Cr
-	-	4	2.0

PRACTICAL

1. Training of sensory panel.
2. To perform sensitivity tests for four basic tastes
3. To perform analytical and affective tests of sensory evaluation.
4. Recognition tests for various food flavors.
5. Sensory evaluation of milk and milk products.
6. Flavor defects in milk
7. Extraction of pigments from various fruits and vegetables and study the effect of temperature and pH
8. Texture evaluation of various food samples- cookies/ biscuits/ snack foods

Recommended Readings:

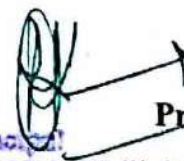
1. Rao E. S. (2013). Food Quality Evaluation. Variety Books.
2. Pomeranz Y and Meloan CE (2002). Food Analysis – Theory and Practice, CBS Publishers and Distributors, New Delhi.
3. deMan J. (2007). Principles of Food Chemistry, 3rd ed., Springer.
4. Meilgard (1999). Sensory Evaluation Techniques, 3rd ed. CRC Press LLC, 1999.
5. Amerine, Pangborn & Roessler (1965). Principles of Sensory Evaluation of food, Academic Press, London.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

5th Semester (3rd Year, Course: B. Sc. Food Science and Technology) 2+4

BFST FIFTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Core	BFST-301	Food Engineering	3	-	40	60	100	3
	BFST-303	Food Chemistry	3	-	40	60	100	3
	BFST-303 (Pr)	Food Chemistry Practical	-	4	60	40	100	2
DSE	BFST-305	Nutraceutical and Functional Foods	3	-	40	60	100	3
	BFST-307	Food Quality Management	3	-	60	40	100	2
GE	BFST-309	Food Packaging	3	-	40	60	100	3
	BFST- 309 (Pr)	Food Packaging Practical	-	4	60	40	100	2
SEC	BFST-311	Project and Technical Report	3	-	100	-	100	3
		Total	18	08	440	360	800	21



Principal

Principal
 MMCT & BM (Hotel Management)
 Maharishi Merikandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD ENGINEERING
5th Semester; 3rd Year of the Three-Year Degree Program
BFST-301

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- 1) To understand the principle of Unit operation
- 2) To acquaint with fundamentals of food engineering and its process
- 3) To understand the basics of designing of food plant and systems

UNIT 1

Introduction: Concept of Unit operation, Units and dimensions, Unit conversions, dimensional analysis, Mass and Energy Balance, Related numerical

Design of food plant: Important considerations for designing of food plants, Types of layout

Grinding and mixing: Principle and equipments used in food industry

Fluid Flow in food Processing: Liquid Transport systems, Properties of Liquids, Newton's Law of Viscosity, Principle of Capillary tube and rotational viscometer

UNIT II

Fluid Flow in food Processing: Properties of Non-Newtonian fluids, Flow characteristics, Reynolds Number, Bernoulli's Equation, Concept of Flow Measurement devices, Related basic numericals

Refrigeration and Freezing: Concept and selection of a refrigerant, Description of a Refrigeration cycle, Pressure Enthalpy charts and Tables, Mathematical expressions useful in analysis of vapour compression refrigeration cycle, Numericals based on VCR system, Freon 12 and R-717, superheating and sub cooling, Freezing time calculation using Plank's Equation, Frozen food storage, Related basic numerical

UNIT-III

Heat and Mass Transfer: Systems for heating and cooling food products, Thermal Properties of Food, Modes of heat transfer, Application of steady state heat transfer- estimation of conductive heat transfer, coefficient, convective heat transfer coefficient, overall heat transfer coefficient and design of tubular heat exchanger, Fick's Law of Diffusion, Membrane separation systems- Electrodialysis system, Reverse Osmosis, Membrane System, and Ultrafiltration Membrane System, Membrane devices used for RO and UF: Plate and Frame, Tubular, Spiral wound and hollow fiber devices

UNIT-IV

Psychrometrics: Properties of Dry Air, Properties of Water Vapour, Properties of air Vapour mixture, Psychrometric Chart, Related basic numerical

Steam, Evaporation and Dehydration: Generation of steam, Construction and functions of fire tube and water tube boilers, Thermodynamics of Phase change, Steam tables, Boiling point elevation, Types of evaporations, Design of single effect evaporators, Basic Drying Process, Moisture content on wet basis and dry basis, Dehydration systems, Dehydration system Design, Related basic numericals

Recommended Readings

- 1) Rao DG. 2010. Fundamentals of food engineering. PHI learning private ltd.
- 2) Singh RP and Heldman DR.1993, 2003, 2009. Introduction to food engineering. Academic press 2nd, 3rd and 4th edition.
- 3) Rao C G 2006 Essentials of food process engineering. B S publications
- 4) Fellow P. 1988 Food processing technology



Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD CHEMISTRY
5th Semester; 3rd Year of the Three-Year Degree Program
BFST-303

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To understand the chemistry of foods - composition of food, role of each component and their interaction.
- To understand the functional aspects of food components and to study their role in food processing.

UNIT-I

Introduction to Food Chemistry: Definition, Composition of food

Water: Definition of water in food, Structure of water and ice, Types of water, Sorption phenomenon, Water activity and packaging, Water activity and shelf-life

Lipids: Classification of lipids, Physical properties-melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point, Chemical properties-reichertmeissel value, polenske value, iodine value, peroxide value, saponification value. Effect of frying on fats, Changes in fats and oils- rancidity, lipolysis, flavor reversion, Auto-oxidation and its prevention

UNIT II

Proteins: Protein classification and structure, Nature of food proteins(plant and animal proteins, Properties of proteins (electrophoresis, sedimentation, amphotericism and denaturation), Functional properties of proteins eg. organoleptic, solubility, viscosity, binding gelation/texturization emulsification, foaming.

Physico-chemical and nutritional changes occurring during food processing treatments: Drying and dehydration, Irradiation, Freezing, Canning

UNIT III

Carbohydrates: Classification (mono, oligo and poly saccharides), Structure of important polysaccharides (starch, glycogen, cellulose, pectin, hemicellulose, gums)

Carbohydrates: Chemical reactions of carbohydrates –oxidation, reduction, with acid & alkali

Vitamins: Structure, Importance and Stability, Water soluble vitamins, Fat soluble vitamins

Flavour: Definition and basic tastes, Chemical structure and taste, Description of food flavours, Flavour enhancers

UNIT IV

Minerals: Major and minor minerals, Metal uptake in canned foods, Toxic metals

Natural Food Pigments: Introduction and classification, Food pigments (chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments, caramel)

Browning Reactions in Food: Enzymatic browning, Non – Enzymatic browning, Maillard reaction, Caramelization reaction, Ascorbic acid oxidation

Enzymes: Introduction, classification, General characteristics, Enzymes in food processing

Enzymes: Industrial Uses of Enzymes, Immobilized enzymes

Recommended Readings

deMan, John M., Principles of Food Chemistry ,3rd Ed., Springer 1999

Desrosier, Norman W. and Desrosier.,JamesN.,The technology of food preservation , 4th Ed.,Westport, Conn. : AVI Pub. Co., 1977.

Fennema, Owen R, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996

Fuller, Gordon W, New Product Development From Concept to Marketplace, CRC Press,2004.

Potter,N.N.andHotchkiss,J.H, Food Science, 5th Ed., Chapman & Hall,1995

Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002

Wong, Dominic WS, Food Enzymes, Chapman and Hall, New York, 1995


Principal
Principal
MMICT & BMS (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
NUTRACEUTICAL AND FUNCTIONAL FOODS
5th Semester; 3rd Year of the Three-Year Degree Program
BFST-305

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objectives:

- To develop comprehensive understanding of different nutraceuticals and functional foods
- To understand the potential of various functional foods in promoting human health

UNIT-I

Introduction: Background, status of nutraceuticals and functional food market, definitions, difference between nutraceuticals and functional foods, types of nutraceutical compounds and their health benefits, current scenario.

UNIT II

Nutraceuticals: Types of nutraceutical compounds – Phytochemicals, phytosterols and other bioactive compounds, peptides and proteins, carbohydrates (dietary fibers, oligosaccharides and resistant starch), prebiotics, probiotics and synbiotics, lipids (Conjugated Linoleic Acid, omega-3 fatty acids, fat replacers), vitamins and minerals; their sources and role in promoting human health.

UNIT III

Functional Foods: Cereal and cereal products, Milk and milk products, egg, oils, meat and products, sea foods, nuts and oilseeds, functional fruits and vegetables, herbs and spices, beverages (tea, wine), Fermented foods – their health benefits and role in conditions like cardiovascular diseases, hypertension, diabetes.

UNIT IV

Functional Foods: Future prospects of functional foods and nutraceuticals and their potential for use in improving health. Development in processing of functional foods. Formulation and fabrication of functional foods.

Legal Aspects: Stability of nutraceuticals. Safety, Consumer acceptance and assessment of health claims, labeling, marketing and regulatory issues related to nutraceuticals and functional foods.

Recommended Readings

1. Wildman REC, Handbook of Nutraceutical and Functional Foods, CRC Press 2001
2. Ghosh D et al, Innovations in Healthy and Functional Foods, CRC Press 2012
3. Pathak YV, Handbook of nutraceuticals Volume 2, CRC Press 2011
4. Various journals of food technology, food science and allied subjects.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD QUALITY MANAGEMENT
5th Semester; 3rd Year of the Three–Year Degree Program
BFST-307

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

L	P	Cr
3	-	3.0

Objective:

- To learn about quality management in food production chain.
- To learn about physical, chemical contaminants in foods
- To learn about latest trends and techniques in food science
- To understand the significance of safe processing of foods.

UNIT 1

Food Quality Management: Introduction to food quality management – Definition of quality, quality concepts, quality perception, quality attributes.
 Concepts of quality management: Objectives, importance and functions of quality control and quality assurance; Quality management systems in India
 Quality in the Agri- food production chain-Techno- managerial approach, food quality relationship and food quality management functions. Dynamics on the agri- food production chain, core developments in food quality management.

UNIT II

Contamination in Food Chain: Contamination in Food: Physical, chemical contaminants (heavy metals, pesticide, residues, antibiotics, agrochemicals, veterinary drug residues, environmental pollutants, radionuclides, solvent residues, chemicals) and Natural toxins.
 Contaminants formed during processing & packaging – nitrosamines, acrylamide, aldehydes, benzene, dioxins and furans, persistent organic pollutants, polymers, etc.
 Chemicals from processing such as fumigants, autoxidation products, carcinogens in smoked foods, intentional and unintentional additives.

UNIT III

Food Additives: Chemical, technological and toxicological aspects
 Risk assessment studies- Safety and quality evaluation of additives and contaminants, Acute and chronic studies, NOEL, ADI, LD₅₀
 Introduction, need of food additives in food processing and preservation. Characteristics and classification of food additives.
 Antimicrobial agents. -Nitrites, sulphides, sulphur di oxide, sodium chloride, hydrogen peroxide.

Antioxidants - Introduction, mechanism of action, natural and synthetic antioxidants, technological aspect of antioxidants.

UNIT IV

Food Additives: Sweeteners- Introduction, importance, classification- natural and artificial, toxicology, consideration for choosing sweetening agents.

Colors- Introduction, importance, classification- natural, artificial, and natural identical, FD&C Dyes and Lakes. Use of plant tissue culture for color.

Basic principles and application of processing techniques: High fructose corn syrup, cryogenic freezing, supercritical fluid extraction, fatmimetics, flavour encapsulation, use of nano technology in foods.

Recommended Readings:

1. Pieterel A, Luning, Willem J. Marcelis, Food Quality Management Technological and Managerial principles and practices, Wageningen,2009.
2. Brannen and et al., Food Additives, Marcel Dekker, New York,1990
3. Jones JM, Food Safety, Eagan Press, 1992
4. Shapton DA and Shapton NF, Principles and Practices for the safe processing of Foods. CRC Press, 1998
5. DeMan, 3rd edition, Principles of Food Chemistry, Springer, 2007.
6. Carol E. Steinhart, M. Ellin Doyle, Food Safety, Food Research Institute, Marcel Dekker, Inc., New York : 1995


Principal
Principal
MMICT & BBA (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD PACKAGING
5th Semester; 3rd Year of the Three-Year Degree Program
BFST-309

L	P	Cr
3	-	4.0

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	3.0	-

Objective:

- To impart comprehensive overview of the scientific and technical aspects of food packaging.
- To instill knowledge on packaging machinery, systems, testing and regulations of packaging

UNIT 1

Introduction to Food Packaging: Packaging Functions and Requirements,, Printing of packages .Barcodes & other marking, Labeling Laws

Food Packaging Materials: Paper and paper-based materials, corrugated fiber board (CFB). Plastics, formation, Types of plastics, Lamination, Biodegradable plastics, Edible packaging and Bio-composites. Recycling and disposal of plastic waste. Metal packaging- Metals: Tinplate, components of tinplate, tin free can (TFC), types of can, metallic films, lacquers
 Glass: Composition, Properties, Methods of bottle making, Types of closures.

UNIT II

Package Designing for Foods: Package design for fresh horticultural produce and animal foods, dry and moisture sensitive foods, frozen foods, fats and oils, thermally processed foods and beverages.

UNIT III

Testing and Regulatory Aspects of Food Packaging: Testing Procedures for Packaging Materials- thickness, tensile strength, puncture resistance, bursting strength, seal strength, water vapor permeability, CO₂ permeability, oxygen permeability, grease resistance.
 Testing Procedures for Packaged Foods - Compatibility and shelf life studies, evaluation of transport worthiness of filled packages. Food Packaging Laws and Regulations.

UNIT IV

Packaging Machinery and Systems: Bottling machines, Cartoning systems, Seal and Shrink packaging machine; Form, Fill and Sealing machine (FFS). Vacuum, Controlled and Modified atmosphere packaging systems; Aseptic packaging systems; Retort packaging, Active and Intelligent packaging systems

Recommended Readings:

1. Robertson GL, Food Packaging – Principles and Practice, CRC Press Taylor and Francis Group, 2012
2. Paine FA and Paine HY, A Handbook of Food Packaging, Blackie Academic and Professional, 1992
3. Coles R, McDowell D, Kirwan MJ Food Packaging Technology. Blackwell, 2003


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD CHEMISTRY PRACTICAL
5th Semester; 3rd Year of the Three-Year Degree Program
BFST-303 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	P	Cr
-	4	2.0

PRACTICAL

1. Determination of gelatinization temperature range (GTR) of different starches and effect of additives on GTR.
2. Determination of refractive index and specific gravity of fats and oils.
3. Determination of smoke point and percent fat absorption for different fat and oils.
4. Determination of percent free fatty acids
5. Estimation of saponification value
6. Estimation of total ash
7. Determination of thermal inactivation time of enzymes in fruits and vegetables.
8. Estimation of iodine value
9. Estimation of peroxide value
10. Determination of carotenoids w.r.t flour pigments.
11. Extend of non-enzymatic browning by extraction methods.
- 12.**Introduction of the concept of new product development

Recommended Readings:

1. Fennema, Owen R, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996
2. Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
3. Wong, Dominic WS, Food Enzymes, Chapman and Hall, New York, 1995
4. Potter, N.N. and Hotchkiss, J.H, Food Science, 5th Ed., Chapman & Hall, 1995
5. DeMan, J.M., Principles of Food Chemistry, AVI, New York, 1980


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

B.Sc. (Food Science & Technology)
FOOD PACKAGING PRACTICAL
5th Semester; 3rd Year of the Three-Year Degree Program
BFST-309 (Pr)

	Theory	Practical
Total Marks	-	100
End Semester Exam	-	40
Sessionals	-	60
Credits	-	2.0

L	P	Cr
-	4	2.0

1. To study the different food packaging material.
2. To estimate wax content of a given material
3. To study the acid resistant property of a can piece
4. To check the continuity of a lacquering in can
5. To check the WVTR of packaging material


Principal
Principal
MMCT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Examination Scheme for Term-end Examination

- i. For theory papers weightage of internal assessment shall be 40 and term-end examination 60.
- ii. The syllabus for each Course shall be set in such a manner that it has only 4 units, preferably equally balanced in terms of academic load. If the number of units are less / more than 4, the curriculum may be amended w.e.f academic session 2018-19.
 - a. Duration shall be 3 hour.
 - b. Maximum marks shall be 60.
 - c. All Questions are compulsory.
 - d. The Question paper is divided in to four sections A, B, C and D.
 - e. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions (2.5 minutes each)
 - f. Section B comprises of 4 questions of 2 marks each, one from each unit. (6 minutes each)
 - g. Section C Comprises of 4 questions of 4 marks each, one from each unit. (10 minutes each). Each question shall have two alternatives, out of which student will be required to attempt one.
 - h. Section D Comprises of 4 questions of 6 marks each, one from each unit. (15 minutes each). Each question shall have two alternatives, out of which student will be required to attempt one.
 - i. The questions shall be set in such a manner that these cover first five level of Bloom Taxonomy i.e. Remembering, Comprehending, Applying, Analysing and Synthesizing.
 - j. The questions shall have three difficulty level namely Easy, Moderate and Difficult with ratio of 1:2:1 respectively.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

BDN FIRST SEMESTER								
	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BDN 101	Fundamentals of Food & Nutrition	4	-	40	60	100	4
	BDN 103	Bakery Science & Technology	4	-	40	60	100	4
	BDN 105	Nutrition for the Family	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	BDN 101 Pr	Fundamentals of Food & Nutrition	-	4	60	40	100	2
	BDN 103 Pr	Bakery Science & Technology		4	60	40	100	2
	BDN 105 Pr	Nutrition for the Family	-	4	60	40	100	2
AECC	ES 101	Environmental science	3	-	40	60	100	3
GE	BDN 107	Human Anatomy & Physiology	4	-	40	60	100	3
DSE	BDN 109	Choose any one	3	-	40	60	100	3
		Total	22	12	420	480	900	27

Electives:

- I First Aid & Nursing**
- II Food Commodities**


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

UNIT I Subject Name: Fundamentals of Food & Nutrition)

Course: B.Sc. Food Science 1st Sem

Subject Code: BDN 101

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
internal	40	-
Credits	4.0	-

Introduction to Nutrition science

Definition of the term Food, Nutrition, Nutrients, Dietetics, Balance Diet, Health, Energy, Adequate Nutrition, Optimal Nutrition, Malnutrition, Under Nutrition, Over Nutrition. Balance diet.

Food as a source of macro (Carbohydrate, fat & protein) and micronutrients (Vitamins & Minerals).

Physiological, Psychological & social functions of food.

Interrelationship between nutrition & health, visible symptoms of good health.

Basic five food groups: Cereals & grains, pulses & legumes, milk & meat products, Fruit & vegetable, Fats & sugars

RDA & its use

Planning balance diet with the use of five food group system according to RDA

UNIT II

Carbohydrates: Introduction, Functions, Classification, Food sources, RDA

Consequences of inadequate and excessive intakes, Dietary fiber. Functions of dietary fiber

Side effect of dietary fiber, Recommended intake, Role In human nutrition, Glycemic Index.

Water: as nutrients, functions, sources, requirement and effect of Deficiency.

UNIT III

Lipids, Fats & oils.

Introduction, Composition, Classification, RDA, Food sources, Function, Recommended intake, Consequences of inadequate & excessive intakes

Proteins: Introduction. Composition. Classification. Functions. RDA. Food sources.

Essential & non-essential amino acids. Protein quality. Protein deficiency & excess

UNIT IV

Minerals

Introduction of Macro minerals.

Introduction of micro mineral, Introduction of trace elements

Functions of micro, macro & trace elements. Food Sources & RDA. Deficiency & toxicity.

Vitamins:

Introduction of vitamins. Classification. Function. RDA. Food sources. Deficiency & toxicity vitamins

Water soluble vitamins (Vit-B1, B2, B3, B5, B6, B7, B9, B12 & Vit-C).

Fat soluble vitamins (Vit-A,D,E & K).

RECOMMENDED READINGS

Khanna K, Gupta S, Seth R, Mahna R, Rekhi T (2004). *The Art and Science of Cooking: A Practical Manual*, Revised Edition. Elite Publishing House Pvt Ltd.

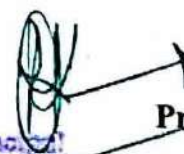
Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). *Basic Food Preparation: A Complete Manual*, Fourth Edition. Orient Black Swan Ltd.

Bamji MS, Krishnaswamy K, Brahmam GNV (2009). *Textbook of Human Nutrition*, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.

Srilakshmi (2007). *Food Science*, 4th Edition. New Age International Ltd.

Wardlaw and Insel MG, Insel PM (2004). *Perspectives in Nutrition*, Sixth Edition. Mosby.

Chadha R and Mathur P (eds). *Nutrition: A Lifecycle Approach*. Orient Blackswan, Delhi. 2015



Principal

Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Fundamentals of Food & Nutrition) PR
Course: B.Sc. Food Science 1st Sem
Subject Code: BDN 101PR

	Theory	Practical
Total Marks		100
End Semester Exam		40
Internal		60
Credits		4.0

PRACTICAL

1. Weights and measures; preparing market order and table setting
2. Food preparation, understanding the principles involved, nutritional quality and portion size

Beverages: Hot tea/coffee, Milk shake/ lassi, fruit based beverages

Cereals: Boiled rice, pulao, chapatti, parantha, puri, pastas

Pulses: Whole, dehusked

Vegetables: curries, dry preparations

Milk and milk products:Kheer, custard

Meat, Fish and poultry preparations

Egg preparations: Boiled, poached, fried, scrambled, omelettes, egg pudding

Soups: Broth, plain and cream soups

Baked products: Biscuits/cookies, cream cakes, sponge cake preparations, tarts and pies

Snacks: pakoras, cutlets, samosas, upma, poha, sandwiches

Salads: salads and salad dressings.


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Bakery Science & Technology

Course: B.Sc. Food Science 1st Sem

Subject Code: BDN 103

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
internal	40	-
Credits	4.0	-

UNIT-I

Bakery Industry: Raw materials for bakery products: flour, sugar, shortening, yeast, salt etc as raw material for bakery products, their role and PFA specifications of these raw materials. Status of bakery industry in India

Bread, Buns and Pizza Base: Ingredients & processes for breads, buns, pizza base, Equipments used, product quality characteristics, faults and corrective measures

UNIT II

Cakes: Ingredients & processes for cakes, Equipments used, product quality characteristics, faults and corrective measures. Different types of icings.

Modified bakery products: Modification of bakery products for people with special nutritional requirements e.g. high fiber, low sugar, low fat, gluten free bakery products.

UNIT III

Biscuits, cookies and crackers: Ingredients & processes, Equipments used, product quality characteristics, faults and corrective measures.

UNIT IV

Breakfast Cereals, Macroni products and Malt: Production and quality of breakfast cereals, macaroni products and malt.

Recommended Readings

1. Dubey, S.C. (2007). Basic Baking 5th Ed. Chanakya Mudrak Pvt. Ltd.
2. Raina et.al. (2003). Basic Food Preparation-A complete Manual. 3rd Ed. Orient Longman Pvt. Ltd.
3. Manay, S. & Shadaksharaswami, M. (2004). Foods: Facts and Principles, New Age Publishers.
4. Barndt R. L. (1993). Fat & Calorie – Modified Bakery Products, Springer US.
5. Samuel A. Matz (1999). Bakery Technology and Engineering, PAN-TECH International Incorporated.
6. Faridi Faubion (1997). Dough Rheology and Baked Product Texture, CBS Publications.
8. Samuel A. Matz (1992). Cookies & Cracker Technology, Van Nostrand Reinhold


Principal
Principal,
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Bakery Science & Technology PR

Course: B.Sc. Food Science 1st Sem

Subject Code: BDN 103 PR

	Theory	Practical
Total Marks		100
End Semester Exam		40
internal		60
Credits		4.0

PRACTICAL

List of Experiments:

1. Quality analysis of raw materials used in Bakery and confectionery industry according of PFA standards, Preparation and evaluation of Bakery and Confectionery products:
2. Bread : White Sandwich; High volume milk bread, using different methods
3. Cakes: with eggs; without eggs, ;using different methods
4. Biscuits: using different methods, Buns, Pizza
5. Study and analysis of the production charts used for different products by bakery industries, visits to Bakery and Confectionery industry, Local market survey for Bakery and confectionery products.


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Nutrition for the Family

Course: B.Sc. Food Science 1st Sem

Subject Code: BDN 105

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
internal	40	-
Credits	4.0	-

Unit – I

Introduction to meal management

Nutritive value of common Indian foods by ICMR. The planning of balance diet

Nutrition in pregnancy: In this cover physiological stages of pregnancy, expected weight gain,

Nutritional requirements including sources, Food selection, Complication of pregnancy (primary and secondary)

Nutrition during lactation

Physiology of lactation: Role of hormones, factors affecting the volume and composition of breast milk, nutritional and food requirements, suggested recipes for a lactating mother

Unit – II

Nutrition during infancy

Growth & development: Nutritional requirements, RDA, Breast feeding, importance of breast milk, Infant formula, preterm baby, Introduction of supplementary foods

Nutrition during early childhood (Toddler/Preschool)

Nutrition related problems, Factors affecting nutritional status Feeding patterns, RDA

Unit – III

Nutrition of school children

Nutritional requirement, Importance of snacks, School lunch. RDA

Nutrition during adulthood: nutritional requirements, food adequacy, low cost balanced diets

Unit – IV

Geriatric nutrition: Process of ageing, factors affecting food intake and nutrient use, nutrient needs, nutrition related problems


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Nutrition for the Family PR

Course: B.Sc. Food Science 1st Sem

Subject Code: BDN 105 PR

	Theory	Practical
Total Marks		100
End Semester Exam		60
internal		40
Credits		4.0

PRACTICAL

Planning, preparation and nutritional evaluation of diets in relation to physiological state.

1. Planning and preparation of a balanced diet for a pregnant woman.
2. Diet during complication of pregnancy.
3. Planning and preparation of a balanced diet for a lactating woman.
4. Preparation of weaning foods.
5. Planning and preparation of a balanced diet for pre-school child.
6. Balanced diet for school going child. Preparation of packed lunch.
7. Planning and preparation of a balanced diet for adolescence.
8. Planning of meals for adult belonging to different income group.
9. Planning meal for senior citizen.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutana, Ambala-133207

Subject Name: Environmental Sciences

Course: B.Sc. Food 1ST Sem

Subject Code: ES 101

Theory Maximum Marks :	100	Credits :3
Internal Marks	40	
External Marks	60	

Unit 1:

Multidisciplinary nature of environmental studies

Definition, scope and importance, need for public awareness.

Unit 2: Natural Resources:

Renewable and non-renewable resources: Natural resources and associated problems

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.

- Equitable use of resources for sustainable lifestyles.

Unit 3: Ecosystems

- Concept of an ecosystem.

- Structure and function of an ecosystem.

- Producers, consumers and decomposers.

- Energy flow in the ecosystem.

- Ecological succession.

- Food chains, food webs and ecological pyramids.

- Introduction, types, characteristic features, structure and function of the following ecosystems:-

- a. Forest ecosystem

- b. Grassland ecosystem

- c. Desert ecosystem

- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 4: Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity.

- Biogeographical classification of India

- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values

- Biodiversity at global, National and local levels.

- India as a mega-diversity nation

- Hot-spots of biodiversity.

- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.

- Endangered and endemic species of India

- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 5: Environmental Pollution

Definition

- Cause, effects and control measures of:
 - a. Air pollution
 - b. Water pollution
 - c. Soil pollution
 - d. Marine pollution
 - e. Noise pollution
 - f. Thermal pollution
 - g. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and Industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

Unit 6: Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

Unit 7: Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

Unit 8: Field work

- Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc.

Books recommended

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad –380 013, India, Email:mapin@icenet.net (R)
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- Clark R.S., Marine Pollution, Clarendon Press Oxford (TB)
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
- Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
- Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
- Wanger K.D., 1998 Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p
- Kaushik A and Kaushik C.P. Perspectives in Environmental studies. New Age International Publisher (TB)*
- Deswal S. and Deswal A. Basic Course in Environmental Studies. Dhanpar Rai & Co. (TB)*
- Santra S.C. Environmental Science. New Central Book Agency (P) Ltd. (TB)*
- Sharma P.D. Ecology and Environment. Rastogi Publications. (TB)


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Human Anatomy & Physiology
Course: B.Sc. Food Science 1st Sem
Subject Code: BDN 107

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
internal	40	-
Credits	4.0	-

Unit – I

Skelton system – Main bones of the body and their functions.

Digestive System - Structure and functions of various parts of alimentary canal and digestive glands - Mouth, buccal cavity, pharynx, esophagus, stomach, small and large intestine and anus.

Salivary Glands, liver, pancreas, gastric glands, intestinal glands.

Unit – II

Circulatory system - Structure and functions of heart, blood composition, blood groups, clotting and its significance and ECG.

Respiratory system - Structure and function of respiratory system and tract, nose trachea, larynx, bronchi and lungs, Mechanism of respiration.

Skin - Structure and functions of skin.

Unit – III

Excretory system –Organs, structure and functions, ureter, urinary, bladder, formation of urine, composition of normal urine

Nervous System – Structure and functions of brain and spinal cord, reflexion.

Sense organs – (i) Eye- structure and functions, physiology of vision and its defects. (ii) Ear – structure, functions; mechanism of hearing

Unit – IV

Endocrine system –Hormones-endocrine glands- their structure and Functions – pituitary, thyroid, parathyroid, adrenal, hormones of Reproduction

Reproductive system- female reproductive organs- structure and functions, Male reproductive organs – structure and functions. Menstruation, puberty, menopause, Fertilization

Books Recommended:

1. Stand, F.L. Modern Physiology the Macmillan Company Latest Ed.
- 2 Guyton, A.C. Text Book of Medical Physiology W.S. Saunders
- 3 Davidson, B. and Smith E., Text book o Physiology and Biochemistry, 1972 (8th Ed)
- 4 Human Physiology _ A.J. Vander


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Food Commodities
Course: B.Sc. Food Science 1st Sem
Subject Code: BDN 109

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
internal	40	-
Credits	3.0	-

MODULE	TOPICS	NO.OF LECTURE REQUIRED
1.	BASIC COMMODITIES - Salt - Sugar - Fats & Oils	6
2.	RICE, CEREALS, PULSES and NUTS - Introduction - Classification and identification - Use of Rice, Cereals, Pulses and Nuts in Cookery - Examples of famous dishes of Rice, Cereals, Pulses and Nuts	8
3.	MILK & MILK PRODUCTS - Introduction to Milk and Milk Products - Processing of Milk and Milk Products - Types Uses and famous Dishes using Milk and Milk Products	10
3.	HERBS & SPICES - Identification and Classification of Herbs and Spices - Difference between Herbs and Spices - Uses of Herbs and Spices	6
4.	USES OF COMMODITIES Used as Binding Agents, Coloring Agent, Leavening/Raising Agents, Thickening Agent, Emulsifying Agent, Food Colours and Additives, Moisturizing Agents	6
	TOTAL	36

Text & References:

- Theory of Cookery by Krishna Arora
- Modern Cookery (Vol. I) by Philip E. Thangam
- A Taste of India by Jaffery, Madhur
- Cookery & Introduction by Ceserani & Kinton
- Contemporary Cookery by Cesarani, kinton & Fosket


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

BDN SECOND SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BDN 102	Introduction to Dietetics	4	-	40	60	100	4
	BDN 104	Food Science	4	-	40	60	100	4
	BDN 106	Nutritional Biochemistry	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	BDN 102 Pr	Introduction to Dietetics	-	4	60	40	100	2
	BDN 104 Pr	Food Science	-	2	60	40	100	1
	BDN 106 Pr	Nutritional Biochemistry	-	2	60	40	100	1
AECC	BDN 108	Communication	3	-	40	60	100	3
AECC Practical	BDN 108 Pr	Communication	-	2	60	40	100	1
GE	BDN 110	Fundamentals of Management	3	-	40	60	100	3
DSE	BDN 112	Choose any one	3	-	40	60	100	3
		Total	21	10	480	520	900	26

Electives:

- I Food Hygiene & Sanitation**
- II Food Handling & Packaging**


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

Subject Name: Introductions to Dietetics

Course: B.Sc. Food Science 2ND Sem

Subject Code: BDN

102

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
internal	40	-
Credits	4.0	-

UNIT I

Introduction to term Dietician

Definition of Dietician • Educational Qualification of Dietician • Difference between registered dietician & Nutritionist • tools used by dietician • Area of work

Role of dietician in hospital: - work area of hospital dietician • role of hospital dietician

Role of dietician in community: - work area of community dietician • role of community dietician

UNIT II

Introduction to Nutrition Care Process

Definition of Nutrition Care Process • Steps of Nutrition Care Process

Nutrition Assessment:- Definition • Nutrition assessment component • Critical thinking

Nutrition Diagnosis:- nutrition diagnosis domain:- intake, clinical, behavioral – environmental •

Nutrition diagnosis component • nutrition vs. medical diagnosis

Nutrition Interventions:- Definition • objectives

Nutrition Monitoring & Evaluation :- Definition • Nutrition monitoring & evaluation components • nutrition goals & objectives • evaluation of nutrition care

UNIT III

Introduction to Diet Therapy:-

Definition of Diet therapy • objectives of diet therapy

Principles of Diet Therapy

Definition of Diet therapy • Concepts of diet therapy

Introduction to Therapeutic Nutrition

Definition of therapeutic nutrition • objectives of therapeutic diet • therapeutic nutrition for changing need

Therapeutic Adaptation of Normal Diet

Definition of therapeutic diet • therapeutic adaptation:- change in consistency • change in energy intake • change in nutrient • change in fiber • change in frequency of feeding • change in mode of feeding • change in elimination of food

UNIT IV

Therapeutic Diets

Introduction to therapeutic diet • Modification of normal diet •

Routine Hospital Diet:- clear liquid diet • liquid diet • semi-solid diet • soft diet • normal diet • tube feed • PEG feed • JJ feed • bland diet • high & low calorie diet • high & low protein diet • high & low fiber diet • low cholesterol diet


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Introductions to Dietetics (PR)
Course: B.Sc. Nutrition and dietetics 2ND Sem
Subject Code: BDN 102 PR

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

1. Standardization of common recipes with their yield
2. Calculation of amount of foods that provide 100 calories
3. Analyzing effect of cooking on food.
4. Planning, preparation and displaying of normal diet.
5. Planning, Preparation and displaying of clear fluid diet, full fluid diet and soft diet.
6. Planning, Preparation and displaying high calorie diet for underweight and low calorie diet for overweight.


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Food Science

Course: B.Sc. Nutrition and dietetics 2ND Sem

Subject Code: BDN 104

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT I

Cereals and cereals products: Structure and composition, Nutritional value, Processing- Milling, polishing, Parboiling, flaking, parching, roasting, use in variety of preparations, election, storage and care, breakfast cereals

Pluses: Composition, nutritional value, processing, soaking, Germination. Cooking, fermentations
Toxic constituents of pulses, Lathyrism

UNIT II

Milk and milk products: Composition of milk, properties, effect of heat, nutritional importance, milk processing, milk products

Eggs Structure: Composition & Quality of eggs, Classification of egg & egg products, Nutritive value.

UNIT III

Nuts and oil seeds: Nutritive value, importance, classification, toxins

Fats and oils: Nutritional importance, composition, Types, Smoking point, Role of fat/oil in cookery

UNIT III

Fruits and vegetables: Classification, Composition, Nutritive value, Storage, cooking of vegetables, changes during cooking, Effect of heat, acid and alkali Importance in human nutrition

Recommended Readings:

1. Coles R, McDowell D and Kirwan MJ, Food Packaging Technology, CRC Press, 2003
2. De S, Outlines of Dairy Technology, Oxford Publishers, 1980
3. Deman JM, Principles of Food Chemistry, 2nd ed. Van Nostrand Reinhold, NY 1990
4. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004
5. Jenkins WA and Harrington JP, Packaging Foods with Plastics, Technomic Publishing Company Inc., USA, 1991
6. Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi, 1987
7. Meyer LH, Food Chemistry, CBS Publication, New Delhi, 1987
8. Potter NH, Food Science, CBS Publication, New Delhi, 1998
9. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
10. Ranganna S, Handbook of Analysis and Quality Control for Fruits and Vegetable Products, 2nd ed. TMH Education Pvt. Ltd, 1986


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Food Science PR

Course: B.Sc. Nutrition and dietetics 2ND Sem

Subject Code: BDN 104 PR

Theory Maximum Marks :	100	Credits :2
Internal Marks	60	
External Marks	40	

1. Estimation of reducing sugar by Fehlings procedure
2. Estimation of salt content in brine
3. Estimation of salt content in butter
4. Preparation of brix solution and checking by hand refractometer
5. Application of colloidal chemistry to food preparation
6. Demonstration of the Soxhlet method for determination of fat content
7. Determination of acidity of water
8. Determination of alkalinity/ hardness of water
9. Demonstration of the Kjeldahl's method for estimation of protein content

Recommended Readings:

1. Coles R, McDowell D and Kirwan MJ, Food Packaging Technology, CRC Press, 2003
2. De S, Outlines of Dairy Technology, Oxford Publishers, 1980
3. Deman JM, Principles of Food Chemistry, 2nd ed. Van Nostrand Reinhold, NY 1990
4. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004
5. Jenkins WA and Harrington JP, Packaging Foods with Plastics, Technomic Publishing Company Inc., USA, 1991
6. Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi, 1987
7. Meyer LH, Food Chemistry, CBS Publication, New Delhi, 1987
8. Potter NH, Food Science, CBS Publication, New Delhi, 1998
9. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
10. Ranganna S, Handbook of Analysis and Quality Control for Fruits and Vegetabl


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Nutritional Biochemistry

Course: B.Sc. Nutrition and dietetics 2ND Sem

Subject Code: BDN 106

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT-1

Chemistry of carbohydrates & their related metabolism: Introduction, Definition, Classification, Biomedical importance, Brief outline of metabolism: Glycogenesis, Glycogenolysis, Glycolysis, Citric acid cycle & its significance, HMP shunt, Gluconeogenesis, regulation of blood glucose level

UNIT-II

Amino acids: Definition, classification, Essential & non essential amino acids

Chemistry of Proteins & their related metabolism: Introduction, definition, classification, biomedical importance Metabolism: Transformation, Decarboxylation, Ammonia formation & transport, Urea cycle

UNIT-III

Chemistry of Lipids & their related metabolism: Introduction, Definition, Classification, Biomedical importance, Essential fatty acids, Identification of fats & oils (saponification no, acid no, iodine no, acetyl no, reichert- miesel no. etc.) Brief outline of metabolism, Beta oxidation of fatty acids, ketosis

Acid base balance concepts & disorders: Ph, Buffers, Acidosis, Alkalosis

UNIT-IV

Vitamins: Water & fat soluble vitamins, sources, requirement, deficiency disorders, Biochemical functions


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Merikandashwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Nutritional Biochemistry pr

Course: B.Sc. Nutrition and dietetics 2ND Sem

Subject Code: BDN 106 PR

Theory Maximum Marks :	100	Credits :2
Internal Marks	60	
External Marks	40	

PRACTICAL

- Preparation of standard solutions.
- Preparation of buffers using buffer tablets and verify pH
- Isolation and estimation of casein from milk.
- To test milk for different types of adulterants

Qualitative tests for mono, di, and polysaccharides and their identification in unknown solution.

Quantitative estimation of glucose, sucrose and lactose by titrimetric method

- Properties of Fat
- Estimation of calcium using EDTA by titration
- Estimation of ascorbic acid by using 2, 6 dichlorophenol indophenol method


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Communication
Course: B.Sc. Food Science 2ND Sem
Subject Code: BDN-108

Theory Maximum Marks :	100	Credits :3
Internal Marks	40	
External Marks	60	

Communication

UNIT-1:

Grammar and Editing

Basics of Grammar (Parts of Speech—Noun, Pronoun, Adjective, Adverb, Conjunction, Preposition, Interjection, Verb)

Advanced Grammar (Syntax and Common Errors—pertaining to different part of speech focusing on editing activities)

UNIT-2:

Common Vocabulary: Idioms and Phrases, One word Substitution, Antonyms and Synonyms, Homophones and Homonyms

Unit 3

Composition Skills: Paragraph Writing, Official Letter/Application, Job Application and Resume Writing, E mail Writings

UNIT 4:

Reading Skills, Reading Comprehension, Précis

BOOKS RECOMMENDED:

1. *A Practical English Grammar* by Thomson and Martinet 4th Edition, 1986
2. *English Grammar and Composition* by Rajendra Pal (Sultan Chand and Co. New Delhi) Vol II, 2011
3. *You Can Win* by Shiv Khera, , Macmillan Books, New York, 2003
4. *Business Correspondence and Report Writing* by R.C.Sharma & Bishan Mohan (Tata Mc. Graw Hill Company, New Delhi)
5. *The Functional Aspects of Communication Skills* by P.Prasad and Rajendra K. Sharma (S.K.Kataria & Sons, New Delhi) 2007
6. *Lesikar's Basic Business Communication* by Raymond Lesikar & Others(Mc. Graw –Hill Co. USA) 1998
7. *The Oxford Guide to Writing and Speaking*, (John Seely, Oxford University Press, New Delhi) (2004) *Effective Technical Communication*, M. Ashraf Rizvi, (Tata Mc. Graw-Hill Publishing Company Ltd.) 2005


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Communication pr
Course: B.Sc. Food Science 2ND Sem
Subject Code: BDN-108 pr

Theory Maximum Marks :	100	Credits :2
Internal Marks	40	
External Marks	60	

LIST OF PRACTICALS AND ACTIVITIES

All activities will cover almost all the four aspects of communication skills i.e. Listening, Reading, Writing and Speaking.

- 1. Self Analysis**
- 2. Role Play**
- 3. Rapid reading**
- 4. Picture Description and Vocabulary Building**
- 5. Pronunciation and Introduction to speech Sounds**
- 6. Words Commonly Mispronounced**
- 7. Graphic presentation**
- 8. PowerPoint Presentation**
- 9. Group discussion**
- 10. Public Speaking: Important tips to effective public speaking skills**
- 11. Conducting Meeting**
- 12. Interview Skills and mock interviews**

Books suggested as study material:

- Improve your communication skills*, Barker. A Kogan Page India Pvt Ltd, New Delhi 2011
- The Oxford Guide to writing and speaking*, John Seely, Oxford University Press, New Delhi (2004)
- How to prepare for group Discussion and Interview*, Hari Mohan Prasad and Rajnish Mohan, Tata Mac Graw Hill, New Delhi 1982
- Speaking English Effectively*, Krishna Mohan and NP Singh, MacMillan India Ltd..Delhi 1985
- English Speaking*, Sashikumar V, & PV Dhamija, Tata Mc Graw-Hill Publishing Co. Ltd 1983
- Spoken English*, CIEFL, Hyderabad, in 3 volumes with 6 cassettes, OUP.
- English Language Communication: A Reader cum Lab Manual*, Dr. A Ramakrishna Rao, Dr.G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2007
- Body language*, Allen Pease, Competition Review Pvt. Ltd., New Delhi 2008


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Fundamentals of Management

Course: B.Sc. Food Science 2ND Sem

Subject Code: BDN 110

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

Unit 1 Nature of Management: Meaning & Definition, Characteristics, Importance, And Management: A Science or Art, Principles & Levels of Management, Management Functions & Development of Management

Unit 2 Planning & Organizing: Meaning, Definitions, features, Types of Plans & Planning Force, Importance of planning, Decision Making process, Concept, Rationality in decision making , Forecasting and its importance, Delegation of Authority its meaning and importance, Coordination – Definition need and importance.

Unit 3 Staffing & Directing: Meaning, Recruitment its sources & Selection its STEPS, Training & NEED AND METHODS, Directing: Meaning elements and importance

Unit 4 Leadership & Managerial Control: Leadership: Meaning, definitions, importance and qualities. Controlling – Meaning, definition, importance and Process.

References:

- Principles & Practice of Management; C B Gupta
- Principles of Management; P C Tripathi, P N Reddy
- Principles & Practice of Management, L M Prasad


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject: HYGIENE AND SANITATION

Code: BDN 112

Courses: BDN Semester 2nd sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

S.NO	TOPIC	LECTURE REQUIRED
UNIT-1	<ul style="list-style-type: none">• Introduction to Hygiene and Sanitation:• Hygiene, Sanitation, meaning, uses in industry.• Importance of hygiene and sanitation in industry.• Personal hygiene for staff members in the production areas in preparing food or coming in touch with food and beverages.• Personal hygiene for staff coming in touch with guests.	10
UNIT-2	<ul style="list-style-type: none">• Proper care and food sanitation• Food handling for kitchen and service staff.• High-risk Foods• Preventing Contamination• Temperature Control• Storage of various food materials	8
UNIT-3	<ul style="list-style-type: none">• Food Poisoning• Food Poisoning, meaning in context of water and food• Water and food borne diseases- roots of contamination• Moulds, Yeasts, Bacteria,• HACCP-Brief Introduction	10
UNIT-4	<ul style="list-style-type: none">• Cleaning Methods• Cleaning Agents, Water Detergents, Abrasives, Disinfectants• Cleaning Schedules, Pest control,• Indoors environment, air, water, waste disposal	12
	TOTAL LECTURES	40

REFERENCES:

Hotel Management-Educational and Environmental Aspects-Yogendra K. Sharma

Food Science and Nutrition - [Sunetra Roday](#)

Food Hygiene- Kavita Ed Marwaha

Food and Hygiene- William Tibbles

Elements of Hygiene and sanitation- Theodore Hough


Principal
Principal,
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

BDN THIRD SEMESTER								
	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BDN 201	Therapeutic Nutrition & Dietetics-I	4	-	40	60	100	4
	BDN 203	Food Preservation	4	-	40	60	100	4
	BDN 205	Principles of Human Nutrition	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical AECC	BDN 201 Pr	Therapeutic Nutrition & Dietetics-I	-	4	60	40	100	2
	BDN 203 Pr	Food Preservation	-	4	60	40	100	2
	BDN 207	Introduction to Computers	3	-	40	60	100	3
AECC Pr	BDN 207 Pr	Introduction to Computers	-	2	60	40	100	1
GE	BDN 209	Diet & Nutrition Counselling	3	-	40	60	100	3
DSE	BDN 211	Choose any one	3	-	40	60	100	3
		Total	21	10	420	480	800	26

Electives:

- I Introduction to Psychology**
- II Fermentation Technology**
- III Culinary Science**


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject: Therapeutic Nutrition & Dietetics

Courses: BDN Semester 3rd sem

Code: BDN 201

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

UNIT-1

Therapeutic Diets:-Routine Hospital Diet:-

clear liquid diet, liquid diet, semi-solid diet, soft diet, normal diet, tube feed, PEG feed, JJ feed, bland diet, high & low calorie diet, high & low protein diet, high & low fiber diet ,low cholesterol diet

Oral feeding: - definition, factors affecting oral feeding, precautions, dietary modification

Tube feeding: - definition, types, administration, conditions • precautions, dietary modification

Parental nutrition: - definition, types, administration, conditions, precautions, dietary modification

Intravenous feeding: - definition, types , administration, conditions, precautions, dietary modification

UNIT-II

Modification of Diet:-

Infection :- Nutrient & immune response during infection, Metabolic changes during infection, Nutritional management in infection

Fever:-classification of fever , acute fever • chronic fever, Metabolic changes during fever

Acute fever:- Typhoid:- introduction , prevalence, mode of transmission, signs & symptoms, stages of fever, complications, dietary modification

Chronic fever:- Tuberculosis:- introduction • prevalence• mode of transmission • signs & symptoms • stages of fever • complications• dietary modification

Influenza:- introduction • prevalence• mode of transmission • signs & symptoms • stages of fever • complications• dietary modification

Recurrent Malaria:- introduction • prevalence• mode of transmission • signs & symptoms • stages of fever • complications• dietary modification

UNIT-III

Diet in Gastritis

Peptic Ulcers: – introduction , types of peptic ulcers, signs & symptoms, clinical findings complications • dietary modification. four stage diet:- Liquid, soft, convalescent, liberalized diet

Diet in disturbances of Small Intestine:-

Diarrhea:- introduction • types of diarrhea• signs & symptoms • dietary modification :- fiber • fluids

Constipation:- introduction • types of constipation• signs & symptoms •dietary modification

Flatulence:- introduction • types• causes• signs & symptoms • dietary modification

Diverticulosis Disease:- introduction • prevalence• causes• signs & symptoms • dietary modification

Inflammatory Bowel Disease:- introduction • Categories of IBS:- crohn's disease & ulcerative colitis • Prevalence of Crohn's disease and ulcerative colitis • signs & symptoms • dietary

modification

UNIT-1V

Diseases of the Pancreas:-

Introduction • function • classification • physiology of pancreas

Pancreatitis:- :- Etiology • types • risk factor • causes • symptoms • complications • dietary treatment:- nutritional requirement • dietary modification • foods avoided • foods given

Diet in Gout:-

Introduction • nature • occurrence of uric acid • causes • symptoms • diagnosis • nutritional management • dietary modification • foods avoided • foods given


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject: Therapeutic Nutrition & Dietetics PR

Courses: BDN Semester 3rd sem

Code: BDN 201 PR

Theory Maximum Marks : 100	Credits :4
Internal Marks	60
External Marks	40

PRACTICAL:

1. Planning, preparations and calculations of diets with modified-

(a) Consistency

(b) Fibre and residue

(c) Diet for Diarrhoea and constipation (d) Diet for peptic ulcer. (e) Diet for liver disease.

2. Planning, preparation and calculation of diets in fever and infections.

REFERENCE BOOKS:

- Textbook of Human Nutrition by Agrawal , Udipi
- Textbook of Nutrition & Dietetics by Kumud Khanna
- Basics of Clinical Nutrition by Y.K.Joshi
- Krause's Food & the Nutrition Care Process (Krause's Food & Nutrition Therapy) by Krause & Mahan
- Clinical Dietetics and Nutrition by F P Antia


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject: Food Preservation
Courses: BDN Semester 3rd sem
Code: BDN 203

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Unit – 1 **Cold preservation:** Freezing: requirements of refrigerated storage - controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes during freezing –concentration effect and ice crystal damage, freezer burn. Refrigeration load, factors determining freezing rate-food composition and non compositional influences

Freezing: Mechanism and freezers: Freezing methods -direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing.

UNIT II **Dehydration:** Normal drying curve , effect of food properties on dehydration , change in food during drying ,drying methods and equipments air convection dryer, tray dryer, tunnel dryer, continuous belt dryer, fluidized bed dryer, spray dryer, drum dryer, vacuum dryer, freeze drying, foam mat drying.

Food Irradiation and Microwave Heating: Ionizing radiation and sources, unit of radiations, direct and indirect radiation effects, safety and wholesomeness of irradiated food. Microwave heating and application.

UNIT III **Principles of Food Preservation:** microorganisms associated with foods- bacteria, yeast and mold, Importance of bacteria, yeast and molds in foods. Classification of microorganisms based on temperature, pH, water activity, nutrient and oxygen requirements, typical growth curve of micro-organisms. Classification of food based on pH, Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, and shelf stable foods.

UNIT IV **Thermal processing:** Introduction, classification of Thermal Processes, Principles of thermal processing, Thermal resistance of microorganisms, Thermal Death Time, Lethality concept, characterization of heat penetration data, Thermal process Calculations. Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching.

References:

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi- 1992
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Food Preservation
Subject Code: BDN 203 PR

Course: BDN 2nd Sem

Theory Maximum Marks :	100	Credits :4
Internal Marks	60	
External Marks	40	

1. Comparison of conventional and microwave processing of food
2. Preservation of food by the process of freezing
3. Thawing of frozen food
3. Drying of food using Tray dryer/other dryers
4. Rehydration of fruits and vegetables.
4. Preservation of food by canning (Fruit/Vegetable/meat)
5. Cut-out analysis of canned food
6. Adequacy of blanching.
8. Preservation of food products by concentration method.
9. Use of chemicals in preservation of foods.

Books Recommended:

Principle of Food Preservation:

1. Food Microbiology by Frazier WC and Westhoff DC, 1988, Tata McGraw Hill Publishers, New Delhi.
2. Food Science by Potter NN, 2006, CBS Publishers, New Delhi.
3. The Technology of Food Preservation by Desrosier & Desrosier.
4. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi- 1992
5. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
6. Rao PG, Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi, 2010
7. Toledo Romeo T, Fundamentals of Food Process Engineering, Aspen Publishers, 1999


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Principles of Human Nutrition
Course: BSc nutrition and dietetics 3RD Sem
Subject Code: BDN 205

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT I

- Concept and Definition of terms – Nutrition, Malnutrition, Health, Brief history of Nutritional Science. Scope of Nutrition.
- Minimum Nutritional Requirements and RDA. Formulation of RDA and Dietary Guidelines – Reference Man and Reference Woman.
- Body Composition and Changes through the Life Cycle.
- Energy in Human Nutrition – Energy Balance, Assessment of Energy Requirements

UNIT II

- .Proteins – Protein Quality (BV, PER, NPU), Digestion and Absorption, Factors affecting protein bio-availability including Anti nutritional factors. Requirements.
- Lipids – Digestion and Absorption, Intestinal resynthesis of triglycerides – Types of fatty acids, Role and nutritional significance (SFA, MUFA, PUFA, W-3)

UNIT III

- Carbohydrates – Digestion and Absorption. Blood glucose and Effects of different carbohydrates on blood glucose, glycemic index.
- Dietary Fibre – Classification, Composition, Properties and Nutritional status significance

UNIT III

- Minerals and Trace Elements – Physiological role, Bioavailability and Requirements.
- Vitamins – Physiological role, Bioavailability and Requirements.
- Water – Functions, Requirements.

REFERENCES:

- Aurand, L.W. and Woods, A.E. 1973. Food Chemistry. AVI, Westport.
- Birch, G.G., Cameron, A.G. and Spencer, M. 1986. Food Science, 3rd Ed. Pergamon Press, New York.
- Fennema, O.R. Ed. 1976. Principles of Food Science: Part-I Food Chemistry. Marcel Dekker, New York.
- Meyer, L.H. 1973. Food Chemistry. East-West Press Pvt. Ltd., New Delhi.
- Potter, N.N. 1978. Food Science. 3rd Ed. AVI, Westport
- Shanuntalamanay, N. and M.Sadaksharaswamy. 1996. Food facts and principles. New Age International Publishers, Chennai.


Principal
MMCT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Introduction to Computers Course:
B.Sc. Nutrition and dietetics 3rd Sem
Subject Code: BDN 207

Theory Maximum Marks :	100	Credits :3
Internal Marks	40	
External Marks	60	

Unit I

Introduction to Computers: Introduction to Computer: Classification, Generations, Organization, Capabilities Characteristics & Limitations, Application of Computer in Hotels, Familiarization with Components of Computers – Hardware: Hardware elements – input, storage, processing & output devices. Block diagram of computer,

Unit II

Introduction to Computers Software: Types of Software, System Software, Application Software, Utility Software's, Use of MS- Office: Basics of MS- Word. MS-Excel and MS-Power Point

Unit III

Internet & Applications: Introduction to Internet: Definition of networks, concepts of web page, website and web searching (browsing). Benefits, Application, Working, Hardware and Software requirements, World Wide Web, Web Browser, URL, Search Engines, Email

Unit IV

Social Media Applications: Introduction to Social Media, Its Role in Promotion, Face book – Creating Pages and Profiles, Merits/Demerits of Social Media, Linked In, Twitter and Other Social Media Applications.

REFERENCES

1. Saxena, S. (2000), A first course in computers, vikas publishing house pvt Ltd., New Delhi.
2. Rajaraman, V (1999) Fundamentals of computers, printice hall India Pvt.Ltd., New Delhi.
3. Kirlinger., F.N, (1983) Fundamentals of behavioral research, Surjeeth publications, New Delhi.
4. Singh(1992) Techniques and methods of social survey research and statistic, prakasan Kendra publication, New Delhi
5. Shukla M.C. and Gulsha., Theory and practice, Sulthan chand and Co.,New Delhi


Principal
Principal
MMICT & BBA (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Introduction to Computers

Course: Bsc Nutrition and dietetics

Subject Code: BFS 207PR

Theory Maximum Marks :	100	Credits :02
Internal Marks	60	
External Marks	40	

PRACTICAL

1. All relevant practical skills regarding usage of computers.
2. MS office and its component – word and its applications\creating documents – Edition spell check, auto correct and print preview, creating and storing data in tables, mail merge and its usage.
3. MS Excel for data analysis, work sheet and its structure data entry editing sorting filtering and copying. Graphs in excel various types of graphs, editing graphs, cut and copy operations.


Principal
Principal
MMICT & BHM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutlana, Ambala-133207

Subject Name: Diet & Nutrition Counselling Course:

BSc nutrition and dietetics 3rd Sem

Subject Code: BDN 209

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT-I

Dietitian as part of the Medical Team and Outreach Services.

Clinical Information – Medical History and Patient Profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status. Correlating Relevant Information and identifying areas of need.

UNIT-II

The Care Process – Setting goals and objectives short term and long term, Counseling and Patient Education, Dietary Prescription.

- Motivating Patients.

UNIT-III

- Working with – Hospitalized patients (adults, pediatric, elderly, and handicapped), adjusting and adopting to individual needs.
- Outpatients (adults, pediatric, elderly, handicapped), patients' education, techniques and modes.

Follow up, Monitoring and Evaluation of outcome, Home visits

UNIT-IV

Maintaining records, Reporting findings, Applying findings, Resources and Aids for education and counseling, Terminating counseling, Education for individual patients, Use of regional language, linguistics in communication process, Counseling and education

References:

1. Gable, J. (1997): Counseling Skills for Dietitians, Blackwell Science.
2. Holli, B.B. and Calabrese, R.J. (1998): Communication and Education Skills for Dietetics Professionals. Lippin Cott Williams & Wilkins, New York.
3. Curry, R.K. and Jaffe, A. (1998): Nutrition Counselling and Communication Skills, W.B. Saunders Co. London.
4. Hosking, G. and Powell, R. (1985): Chronic Childhood Disorders; Wright, Bristol.
5. O'Deughterty, M.M. (1983): Counselling the chronically ill child; The Lewis Publishing Co. Vermont, 1983.

1. Shillitee Psychology and Diabetes, Chapman & Hall Ltd., London,


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

UNIT-I

Introduction to fermentation, Fermentation an ancient tradition, Developments in fermentation technology, Scope and future prospects of fermentation microbiology, Gaden's fermentation classification, Rate of microbial growth and death, Rate of Product formation, Classification of food fermentations - Alcoholic, lactic and acetic acid fermentations.

UNIT-II

General methods of fermentation – Aerobic fermentation, Anaerobic fermentation, Solid state fermentation, and submerged fermentation, Batch and continuous fermentation. Pre-requisite for Industrial fermentation process.

UNIT -III

Fermented products: Concept of fermented foods, Benefits of fermented foods. Definition of Nutraceuticals and types of nutraceutical compounds, production and chemistry of prebiotics, probiotics and synbiotics and their role in promoting human health.

Fermented milk products: Cheese, Curd, Yoghurt, Acidophilic, Bulgarian milk, Koumiss and Kefir.

Legume products: soy sauce, miso, tempeh, idli.

Fruit and Vegetable products: Sauerkraut, Kimchi, Cucumber pickles.

Meat products: Fermented meat sausages.

Alcoholic beverages: Beer, wine, vinegar.

UNIT-IV

Component parts of a fermentor and their functions, Peripheral parts and accessories of a fermentor, Biosensors in fermentation monitoring, common measurement and control systems in fermentor, Contamination problems in fermentation process

Recommended Books:

1. Principles of Fermentation Technology by Stanbury and Whittaker.
2. Biotechnology: Food Fermentation by VK Joshi & Ashok Pandey.
3. Comprehensive Biotechnology by Moo and young (4 volumes)
4. Food Microbiology. 2nd Edition By Adams M & Moss, M. 2008. RSC Publishing.
5. Biotechnology: Food Fermentation Microbiology, Biochemistry and Technology volume2 by Joshi V. K. & Pandey, A., Sanjanya Books 1999.
6. Essentials of Food Microbiology. Edited by John Garbutt. Arnold International Students Edition. 1997
7. Microbiology of Fermented Foods. Volume II and I. By Brian J. Wood. Elsevier Applied Science Publication. 1997
8. Principles of Fermentation Technology by Stanbury, P.F., Whitekar A. and Hall. 1995., Pergaman. McNeul and Harvey. (AC) NEW


Principal
Principal,
MMCT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

BDN FOURTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BDN 202	Therapeutic Nutrition & Dietetics-II	4	-	40	60	100	4
	BDN 204	Food Microbiology	4	-	40	60	100	4
	BDN 206	Sports Nutrition	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	BDN 202 Pr	Therapeutic Nutrition & Dietetics-II	-	4	60	40	100	2
	BDN 204 Pr	Food Microbiology	-	4	60	40	100	2
GE	BDN 208	Introduction to Research	3	-	40	60	100	4
DSE	BDN 210	Healthcare and Hospital Management	3	-	40	60	100	3
GE	BDN 212	Choose from List	3	-	40	60	100	3
		Total	21	8	360	440	800	25

Elective:

Social & Preventive Medicine

Scientific Writing

Food safety


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

Subject Name: Therapeutic Nutrition & Dietetics-II

Course: BDN 4TH SEM

Subject Code: BDN 202

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

UNIT-1

Diet in Allergy

Introduction• types• manifestation • prevalence •stages of disease progression• common food allergens, relation of nutrition & allergy• impact of allergy on nutritional status • causes • signs & symptoms• risk factor• diagnosis • nutritional management

Celiac Disease: - introduction • manifestation of disease• role of gluten • signs & symptoms • complications • dietary modification

Lactose Intolerance:- introduction • manifestation of disease• role of lactase enzyme • signs & symptoms • complications • dietary modification

UNIT-II

Diet in Burn: – Introduction• types of burns • degree of burn • precautions • nutritional management.

Diet in surgery:-Introduction• types of surgery:- general surgery, emergency surgery, gastrointestinal surgery• factors affecting surgery• pre-operative nutrition• post- operative nutrition• goals of dietary management• dietary management

Diet in Cancer

Introduction• origin• causes• diagnosis• relation of nutrition & cancer• effect of cancer on nutritional status• objectives of nutrition therapy• nutritional management

UNIT-III

Diseases of the Liver:-

Introduction • function • classification • path physiology of liver

Jaundice :- Etiology• causes •symptoms •dietary treatment:- nutritional requirement • dietary modification • foods avoided• foods given

Hepatitis:- Etiology• causes •symptoms •dietary treatment:- nutritional requirement • dietary modification • foods avoided• foods given

Cirrhosis:- Etiology• causes •symptoms •dietary treatment:- nutritional requirement • dietary modification • foods avoided• foods given

Hepatic Coma:- Etiology• causes •symptoms •dietary treatment:- nutritional requirement • dietary modification • foods avoided• foods given

Role of alcohol in liver diseases.

UNIT-III

Introduction to Renal Disease:-

Introduction • function of kidney • pathophysiology • types

Acute Glomerulonephritis & Chronic Glomerulonephritis:- introduction • manifestation of disease • causes • signs & symptoms • complications • dietary modification

Nephritis :- introduction • manifestation of disease • causes • signs & symptoms • complications • dietary modification

Nephrotic Syndrome :- introduction • manifestation of disease • prevalence of disease • causes • signs & symptoms • complications • dietary modification

Acute Renal Disease :- introduction • manifestation of disease • prevalence of disease • causes • signs & symptoms • complications • dietary modification

Chronic Renal Disease :- introduction • manifestation of disease • prevalence of disease • causes • signs & symptoms • complications • dietary modification

End Stage Renal Disease :- introduction, manifestation of disease, prevalence of disease, causes signs & symptoms • complications ,dietary modification

Dialysis:- introduction • types of dialysis • nutritional management

Urinary Calculi- introduction • causes • treatment • acid, alkali producing ,neutral foods • dietary modification

UNIT-1V

Diseases of the Gall Bladder:-

Introduction, function • classification, pathophysiology of gallbladder

Cholecystitis:- Etiology • causes • symptoms • dietary treatment:- nutritional requirement • dietary modification • foods avoided • foods given

Cholelithiasis:-Etiology • causes • symptoms • dietary treatment: - nutritional requirement • dietary modification • foods avoided • foods given

REFERENCE BOOKS:

- Textbook of Human Nutrition by Agrawal , Udipi
- Textbook of Nutrition & Dietetics by Kumud Khanna
- Basics of Clinical Nutrition by Y.K.Joshi
- Krause's Food & the Nutrition Care Process (Krause's Food & Nutrition Therapy) by Krause & Mahan
- Clinical Dietetics and Nutrition by F P Antia


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Therapeutic Nutrition & Dietetics-II PR

Course: BDN 4TH SEM

Subject Code: BDN 202 PR

Theory Maximum Marks : 100	Credits :4
Internal Marks	60
External Marks	40

PRACTICAL

1. Planning, preparation and calculation of diets for insulin dependent Diabetes mellitus,
Planning, snacks. Desserts and beverages for diabetes.
2. Planning. Preparation and calculation of diet in cardiovascular diseases.
3. Planning, preparations and calculation of diet in Kidney failure, Kidney transplant, Renal
Complication & Kidney stones.
4. Planning, preparations and calculation of diet in Cancer, Trauma (burns) & Surgery


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Food Microbiology

Course: BDN 4TH SEM

Subject Code: BDN 204

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

UNIT-I

Introduction and scope of food microbiology

Introduction of microbiology and its relevance to everyday life.

- General characteristics of bacteria, fungi, virus, protozoa, and algae.
- Identification of microorganisms
- Morphological characteristics important in food bacteriology
- Industrial importance

Growth of microorganisms

Growth curve

- Intrinsic Factors (Substrate Limitations)
- nutrient content
- pH and buffering Capacity
- antimicrobial barriers and constituents
- water Activity-
- Intrinsic Factors (Substrate Limitations)
- relative Humidity
- temperature

gaseous atmosphere

UNIT-II

Microbiology of deficient food

- a)Cereal and cereal products
- (b) Sugar and sugar products.
- (c) Vegetables and fruits
- (d) Meat and meat products.
- (e) Fish, egg and poultry,
- (f) Milk and milk products
- (g) Canned foods.

Environmental microbiology

- (a) Water and water borne diseases.
- (b) Air and air borne diseases.
- (c) Soil and soil borne diseases.
- (d) Sewage and diseases.

UNIT-III

Waste product handling : –

(a) Planning for waste disposal.

(b) Solid wastes and liquid wastes

Waste treatment and disposal

- Biological oxygen demand (BOD),
- Preliminary treatments,
- Chemical treatment,
- Biological treatment and disposal
- Types of food wastes

Microbial intoxication and infections:

Sources of contamination of food, mycotoxins, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms and method of control.

UNIT-IV

Beneficial effect of organism

Some applications of microorganisms-*Food products*

- Alcoholic drinks
- Dairy products
- Bread
- Vinegar
- Pickled foods
- Mushrooms
- Single-cell protein

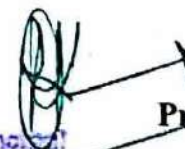
Products from microorganisms

- Enzymes
- Amino acids
- Antibiotics

Citric acid

Relevance of microbial standards for food safety.

- Food Agricultural Organization (FAO),
- World Health Organization (WHO),
- The International Children's Emergency Fund (UNICEF)
- Codex Alimentarius
- The International Commission on Microbiological Specifications for Foods(ICMSF)
- The Food and Drug Administration(FDA)
- United States Department of Agriculture(USDA)
-



Principal

Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Name: Food Microbiology PR

Course: BDN 4TH SEM

Subject Code: BDN 204 PR

Theory Maximum Marks : 100		Credits :4
Internal Marks	60	
External Marks	40	

PRACTICAL

1. Study of equipments in a microbiology lab.
2. Preparation of laboratory media and special media, cultivation of bacteria, yeasts and moulds.
3. Staining of bacteria: gram-staining.
4. Cultivation and identifications of important molds and yeast in food items.
5. Demonstration of available rapid methods and diagnostic kits used in identification of microorganisms or their products.
6. Visit (at least one) to food processing units or any other organization dealing with advanced methods in food microbiology.

• **REFERENCE BOOKS:**

1.	TB	Food Microbiology, 1st Edition,	M. R. Adams	1995
2.	TB	Food Microbiology, 5th Edition	Frazier, Westhoff, Vanitha N M	2014
3.	RB	Laboratory Methods in Food Microbiology , , 3rd Edition	Harrigan F.W	2013
4.	TB	Fundamentals Food Microbiology, 4e	Ray	2011


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: SPORTS Nutrition

Course: BDN 4TH SEM

Subject Code: BDN 206

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

Unit 1

Understanding Fitness

- Definition of fitness, health and related terms
- Assessment of fitness
- Approaches for keeping fit

Unit 2

Importance of nutrition

- Role of nutrition in fitness
- Nutritional guidelines for health and fitness
- Nutritional supplements

Unit 3

Importance of Physical activity

- Importance and benefits of physical activity
- Physical Activity – frequency, intensity, time and type with examples
- Physical Activity Guidelines and physical activity pyramid

Unit 4

Weight Management

- Assessment, etiology, health complications of overweight and obesity
- Diet and exercise for weight management
- Fad diets • Principles of planning weight reducing diets

Books Recommended:

- Wardlaw, Smith. Contemporary Nutrition: A Functional Approach. 2nd ed: Books 2012.Mc Graw Hill.
- Williams Melvin. Nutrition for health, fitness and sports. 2004.Mc Graw Hill
- Joshi AS. Nutrition and Dietetics 2010. Tata Mc Graw Hill.


Principal
Principal
MMCT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Introduction to research

Course: BDN 4TH SEM

Subject Code: BDN 208

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT-I

Role of Statistics and research in nutrition and dietetics :

Objective of research: Explanation, Control and Prediction

Nature and types of Research: Historical, Descriptive, Social Research, Experimental, Field studies, Case study.

UNIT-II

Definition and Identification of a Research Problem:

- Selection of research problems
- Justification
- Hypothesis

Concept and types of variable: Dependent, independent, random, discrete, continuous, Qualitative and quantitative.

UNIT-III

Sampling: Meaning, importance and types:

Random (simple, systemic, stratified, cluster, two stages and multi stage)

Non-random (incidental, purposive, quota, snow ball).

Data gathering Instruments: Interview, Observation, Questionnaire, Rating scale, Reliability and validity of measuring instruments.

Analysis of data and research report

UNIT-IV

Statistics: Meaning, frequency, frequency distribution and its type.

Parametric and Non parametric test.

Normal distribution

Measure of central tendency: Mean, medium, mode.

Measure of dispersion: Range, mean deviation, standard deviation, skewness and kurtosis.

References:

1. S.C. Gupta & V.K. Kapoor: Fundamentals of Mathematical Statistics
2. S.C. Gupta: Fundamentals of statistics
3. G. Udny Yule, N.M.G. Kendall: An Introduction to the theory of Statistics
4. Croxton, F.C. and Cowden, D. J. Applied General Statistics, Prentics hall Inc. 1955
5. Garrett. H. Statistical in Psychology and Education. Oxford book Co.1960.
6. R.P. Hooda: Introduction to statistics. The MacMillon Co.
7. Scotharman, W. A. Textbook of Statistics, (Revised edition) 1973.
8. Kerlinge, Foundations of Behavioral Research
9. Sneedecer G. W. Statistical Methods. Applied Pacific Private Ltd., 1961.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Healthcare and Hospital Management

Course: BDN 4TH Sem

Subject Code: BDN 210

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT I: Hospital Administration:

- Role of Medical Superintendent
- Hospital Administrator
- Resident Medical Officer
- Night Duty Executive
- Public and guest relation
- Importance in patient care, information regarding patients
- Code of press relations, medical information

UNIT II: Quality Management in Hospital

- Definition, Concept of Total Quality Management, importance of TQM,
- Principle of Total Quality management, basic elements of TQM
- Critical Factors Influencing TQM, Total Quality Management Practices in
- Healthcare, Measuring the Quality in Healthcare Service, Relationship
- Between Hospitals and Medical Staff

UNIT III: Health Records

- The World of Informatics
 - The Future of healthcare technology
 - Functions of the health record
 - Changing functions of the patients record
 - privacy, confidentiality and Law
 - Advantages and Disadvantages of the paper record
 - Optically scanned records
- e) **The Electronic Health Record (EHR)**
- Advantages and disadvantages of the EHR
 - Bedside or point-of-care systems
 - Human factors and the EHR
 - Roadblocks and challenges to EHR implementation

IV Telemedicine

a) Telehealth

- Historical perspectives and Types of Technology
- Clinical initiatives and Administrative initiatives
- Advantages and Barriers of telehealth
- Future trends and Summary
- The Future of informatics;

b) Globalization of Information in Telehealth.

Technology in Electronic communication

- Knowledge management
- Genomics
- Advances in public health
- Speech recognition
- Wireless computing and Security
- Informatics Education and Barriers to Information Technology implementation

References

1. Liewellyne Davis and H.M. Macacaulay, Hospital Administration and Planning, JP Brothers, New Delhi, 2001.
2. S.G. Kabra, Medical Audit
3. Arun Kumar (ed) Encyclopedia of Hospital Administration and Development, Anmol Publications, New Delhi, 2000.
4. Srinivasan, A.V. (ed), Managing a Modern Hospitals, Response Books, New Delhi, 2000.
5. Environment Management Systems, ISO 14000 Documents.
6. Syed Amin Tabish, Hospital and Health Services Administration Principles and Practice, Oxford Publishers, New Delhi, 2001.
7. „Hospital Administration“ by D.C. Joshi and Mamta Joshi, Published by Jaypee Brothers, Medical Publishers, New Delhi, 2011
8. Medical Audit by Anjan Prakash – Published by Jaypee Brothers, Medical publishers (P) Ltd., New Delhi, 2011
9. Principles of Hospital Administration and Planning, by B.M.Sakharkar published by : Jaypee Brothers, Medical Publishers (P) Ltd., New Delhi, 2010
10. Sharma – Holistic approach to Hospital Waste Management published by Dept. of Hospital Administration – AIIMS, New Delhi, 2006.
11. Green. E. Paul. Danald S. Tull, Gerald Albaum, Research for Marketing Decisions, Prentice Hall, New Delhi, 1996.
12. Ghosal, A., Elements of Operations Research, Hindustan Publishing Corporation, New Delhi, 1969.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: FOOD SAFETY

Course: BDN 4th Sem

Subject Code: BDN 212

	Theory	Practical
Total Marks	100	-
End Semester Exam	60	-
Sessionals	40	-
Credits	4.0	-

UNIT 1

Introduction to Food Safety

- Definition
- Types of hazards, biological, chemical, physical hazards
- Factors affecting Food Safety
- Importance of Safe Foods

Food Hazards of Physical and Chemical Origin

- Introduction
- Physical Hazards with common examples
- Chemical Hazards(naturally occurring ,environmental and intentionally added), Packaging material as a threat
- Impact on health
- Control measures

Food Hazards of Biological Origin

- Introduction
- Indicator Organisms
- Food borne pathogens: bacteria, viruses and eukaryotes
- Seafood and Shell fish poisoning
- Mycotoxins

Management of hazards

- Need
- Control of parameters
- Temperature control
- Food storage

UNIT-II

Hygiene and Sanitation in Food Service Establishments

- Introduction
- Sources of contamination
- Control methods using physical and chemical agents
- Waste Disposal
- Pest and Rodent Control
- Personnel Hygiene

Food Safety Management Tools

- Packaging material as a threat
- Impact on health
- Control measures

Food Hazards of Biological Origin

- Introduction
- Indicator Organisms
- Food borne pathogens: bacteria, viruses and eukaryotes
- Seafood and Shell fish poisoning
- Mycotoxins

Management of hazards

- Need
- Control of parameters
- Temperature control
- Food storage

UNIT-III

Hygiene and Sanitation in Food Service Establishments

- Introduction
- Sources of contamination
- Control methods using physical and chemical agents
- Waste Disposal
- Pest and Rodent Control
- Personnel Hygiene

Food Safety Management Tools

- Basic concept
- Prerequisites- GHPs ,GMPs,
- HACCP
- ISO series
- TQM - concept and need for quality, components of TQM, Kaizen.

Risk Analysis

- Accreditation and Auditing

UNIT-IV

Microbiological criteria

- Microbiological standards and limits (for processed food, water)
- Sampling
- Basic steps in detection of food borne pathogens
- Water Analysis

Food laws and Standards

- Indian Food Regulatory Regime
- Global Scenario
- Other laws and standards related to food

Recent concerns

- New and Emerging Pathogens
- Genetically modified foods \ Transgenics
- Organic foods
- Newer approaches to food safety

Recommended Readings:

1. Lawley, R., Curtis L. and Davis,J. The Food Safety Hazard Guidebook , RSC publishing, 2004
2. De Vries. Food Safety and Toxicity, CRC, New York, 1997
3. Marriott, Norman G. Principles of Food Sanitation, AVI, New York, 1985
4. Forsythe, S J. Microbiology of Safe Food, Blackwell Science, Oxford, 2000


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

BDN FIFTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BDN 301	Public Health & Nutrition	4	-	40	60	100	4
	BDN 303	Institutional Food Management	4	-	40	60	100	4
	BDN 305	Entrepreneurship Development	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	BDN 301 Pr	Public Health & Nutrition	-	4	60	40	100	2
	BDN 303 Pr	Institutional Food Management	-	4	60	40	100	2
FC	BDN 307	Case Study	-	4	60	40	100	2
GE	BDN 309	Weight Management	3	-	40	60	100	3
GE	BDN 311	Maternal & Child Nutrition	3	-	40	60	100	3
DSE	BDN 313	Choose from List	3	-	40	60	100	3
		Total	21	8	420	480	900	27

Elective:

Quantity Food Production & Service
Herbs & Home Remedies


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Public Health & Nutrition

Course: BDN 5TH Sem

Subject Code: BDN 301

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT-I

Nutritional Problems in India: - Protein Energy Malnutrition • Vitamin A deficiency • Nutritional Anemia • iodine Deficiency Disorder • Chronic disease • Eating disorder

National Nutrition Policy: - Introduction • Aims of NNP • Nutrition policy instrument of NNP • Direct short term Interventions • Indirect Policy instrument

Malnutrition:-

Introduction • definition of malnutrition • types of malnutrition • prevalence • causes • sign & symptoms of under nutrition • conditions caused by under nutrition • factors leading over nutrition • sign & symptoms of over nutrition • conditions caused by over nutrition

UNIT-II

Introduction to Nutritional Disorders:-

Introduction • definition • types

Protein Energy Malnutrition:- introduction • epidemiology • classification • causes • risk factor • clinical features • prevention • dietary management

Nutritional Anaemia:- introduction • epidemiology • causes • risk factor • clinical features • prevention • dietary management

Vitamin Deficiency Disorders :- introduction • epidemiology • causes • risk factor • clinical features • prevention • dietary management

Nutritional Assessment :-

Introduction • Definition • objectives • sampling technique • methods of assessment

Sampling Technique:- Introduction • Definition • objectives • identification of risk group • sampling techniques

Methods of Nutritional Assessment

Introduction • Definition • objectives • Direct assessment • Indirect assessment

Direct assessment – introduction • ABCD method

Anthropometric Method:- Introduction

• Definition • objectives • methods • advantages • disadvantages

Biochemical Method:- Introduction • Definition • objectives • methods • advantages • disadvantages

Clinical Method:- Introduction • Definition • objectives • methods • advantages • disadvantages

Dietary Method:- Introduction • Definition • objectives • methods • advantages • disadvantages

Indirect assessment–

Food balance sheet:- Introduction • Definition • objectives • methods • advantages • disadvantages

Ecological parameters:- Introduction • Definition • objectives • methods • advantages • disadvantages

Vital statistics:- Introduction • Definition • objectives • methods • advantages •disadvantages

UNIT-III

Nutrition of a Community:-

Introduction• Definition of community nutrition • role of nutrition in community development• methods of improving nutritional quality

Modern Methods of Improving Nutritional Quality:-

Food Fortification:- definition• methods • advantages • disadvantages

Nutrient Supplementations:- introduction • types of supplement • advantages • disadvantages
Nutrition education themes and messages in nutrition and health,

Antenatal Care:- definition • importance • objectives • methods• nutrition education

Postnatal Care. :- definition • importance • objectives • methods• nutrition education

Nutritional and infection relationship:-

Introduction• Definition • relationship between nutrition & infection

Immunization

Introduction • classification • precaution • target group • importance • nutritional care

Food borne infection and intoxication diseases:-

Introduction • definition• classification • role of microorganisms• foods involved • target group • intoxication diseases • signs & symptoms •prevention of disease • nutritional care

Infestation of food borne diseases :-

Definition• classification •prevalence •risk factor •causes • Outbreak signs & symptoms • Prevention •control of infection • dietary modification

UNIT-IV

National and International agencies in uplifting the nutritional status –

National Program related to nutrition:- Nutritional problems in India • Nutritional Programs in India

Vitamin A Deficiency program :- introduction • target group • objectives • activities

National Iodine deficiency disorders (IDD) program :- introduction • target group • objectives • factors contributing to the progress of IDD program

SLP:- introduction • target group • objectives • factors contributing to the progress of program • activities

Mid-day Meal program :- introduction • target group • objectives • Monitoring mechanism

Integrated child development scheme :- introduction • target group • objectives • ICDS team •services

National & International Agencies: –

introduction • mission • vision • objectives • functions • policies:

CFTRI, NIN, FAO, NIPCCD , CARE, WHO, UNICEF, ICMR, ICAR, CSIR

Community Nutrition Programme Planning: Introduction, definition of community nutrition

Identification of problem, nutritional assessment, analysis of causes, resources, constraints, selection of intervention, setting a strategy, implementations, evaluation of the programme

Subject Name: Public Health & Nutrition PR

Course: BDN 5TH Sem

Subject Code: BDN 301 PR

Theory Maximum Marks :	100	Credits :4
Internal Marks	60	
External Marks	40	

PRACTICAL

1. Diet and nutrition surveys:

- (a) Identification of vulnerable and risk groups.
- (b) Diet survey for breast-feeding and weaning practices of specific groups.
- (c) Use of anthropometric measurement in children.

2. Preparation of visual aids.

3. Field visit to

- (a) Observe the working of nutrition and health oriented programmes (survey based result).
- (b) Hospitals to observe nutritional deficiencies.

REFERENCE BOOKS:

- Textbook of Human Nutrition by Agrawal , Udipi
- Park's Textbook of Preventive and Social Medicine by Park
- Principles of Nutritional Assessment by Rosalind S. Gibson
- DNHE-1 Nutrition for the Community by Anshu Chaturvedi


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Institutional Food Management

Course: BDN5TH Sem

Subject Code: BDN 303

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

UNIT I

HISTORICAL PERSPECTIVE OF FOOD SERVICE

- Evolution of the food service industry
- Kinds of food service systems Conventional, commissary, ready prepared, assembly/serve

UNIT II

Management & Organization

- Management Theories Classical, Scientific, Behavioral, Systems approach, Contingency approach, MBO, JIT, TQM
- Managerial operations 2 a) Functions of management /manager b) Principles of management c) Definition of Organization and steps in organizing

- Tools of Management 8 a) Tangible Tools: Organization chart, Job description, Job specification, Job analysis: Path way chart, Process chart, Work schedule, Production schedule, Staff and service analysis, Budget b) Intangible tools: Communication, Leadership, Decision making

UNIT III:

MATERIAL MANAGEMENT

a) Menu planning

B)Purchase

c) Storage

d) Food production

Product evaluation, Standardization of recipes, Recipe adjustments and portion control

e) Food delivery and service: Centralized and decentralized, factors affecting selection , Styles of service, delivery and service equipments.

UNIT IV

MANPOWER MANAGEMENT • Manpower Planning: Functions of a personnel manager, Need of Unit Menu, type of operations, Type of service, Job description and job specification •

Manpower placement: Recruitment: Process and Sources-Internal and External a) Selection: Process interview, Tests b) Orientation: Importance, Content of programme, Developing an Orientation programme c) Training: Importance; Types - OJT, Group;

RECOMMENDED READINGS:

- West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York
- Sethi Mohini (2005) Institution Food Management New Age International Publishers
- Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata Mc Graw Hill Book Company
- Knight J B & Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons
- Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey •
- Luthans Fred (2004) Organisational Behaviour 10th Edition Mc Graw Hill


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Institutional Food Management (PR)

Course: BSc Food Science 5TH Sem

Subject Code: BDN 303 PR

Theory Maximum Marks :	100	Credits :4
Internal Marks	40	
External Marks	60	

PRACTICALS:

- To understand the operations of food service units
- To be knowledgeable about products and their price in market
- To develop skills to plan menus for various food service organizations within specific budgets
- To standardized recipes for quantity cooking

- CONTENTS PRACTICALS
- PLANNING MENUS
 - Institutions that cater to children
 - Food service units in Hostels
 - Canteen
 - Conferences

STANDARDIZING RECIPES for 6, 25 and 50 portions. 4

Any two of the following • Snacks • Cakes • cereal preparation • Curry preparations

CANTEEN PROJECT


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Entrepreneurship Development
Course: BDN 5TH Sem

Subject Code: BDN305

Theory Maximum Marks :	100	Credits :2
Internal Marks	40	
External Marks	60	

UNIT 1

INTRODUCTION: Meaning, Needs and Importance of Entrepreneurship, Promotion of entrepreneurship, Factors influencing entrepreneurship, Features of a successful Entrepreneurship.

UNIT II

ESTABLISHING AN ENTERPRISE: Forms of Business Organization, Project Identification, Selection of the product, Project formulation, Assessment of project feasibility.

UNIT III

FINANCING THE ENTERPRISE: Importance of finance / loans and repayments, Characteristics of Business finance, Fixed capital management: Sources of fixed capital, working capital its sources and how to move for loans, Inventory direct and indirect raw materials and its management.

UNIT IV

MARKETING MANAGEMENT: Meaning and Importance, Marketing-mix, product management – Product line, Product mix, stages of product like cycle, marketing Research and Importance of survey, Physical Distribution and Stock Management.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: CASE STUDY

Course: BDN 4TH Sem

Subject Code: BDN 307

Theory Maximum Marks :	100	Credits :4
Internal Marks	100	
External Marks		


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Weight Management

Course: BDN 5TH Sem

Subject Code: BDN 309

Theory Maximum Marks :	100	Credits :3
Internal Marks	40	
External Marks	60	

UNIT I

Introduction – the Measurement of Obesity

Obesity and Health Risks - Obesity and Overweight, CVD and Obesity, Cancers and Obesity, NIDDM and Obesity, HTN and Obesity, Hyperlipidemia/hypercholesterolemia, Osteoarthritis

UNIT II

Psychological AND Eating Disorders -Anorexia Nervosa, Bulimia Nervosa, Anorexia Athletica,

The Female Athletic Triad

UNIT III

Scientific Principles of Weight Loss:

1. The Role of Nutrition/Diet and the “non dieting approach”
2. The role of Exercise/Physical Activity a. Aerobic Exercise b. Resistance Training
3. The role of Behavior Change

UNIT IV

Weight Loss Programs:

1. Commercial Weight Loss Programs a. Biometrics b. Jenny Craig c. Nutrasystem d. Weight Watchers etc
2. Non-Commercial Weight Loss Programs
3. Non-Commercial Support Groups
- 4 Health Fraud and Weight Loss Products and

Textbook

- Human Kinetics. or: Brownell, K.D. & Wadden T.A. (1999). The LEARN® Program for weight control: special medication edition. Dallas: American Health Publishing Additional Resources: Alexander, J.L. (2002).
- The role of resistance exercise in weight loss. Strength and Conditioning Journal, 24(1), 65-69.

- American College of Sports Medicine/American Dietetic Association. (2000). Position Stand: Nutrition and athletic performance joint. *Medicine and Science in Sports and Exercise*, 32, 2130-2145.
- American College of Sports Medicine. (2000). Position Stand: Proper and improper weight loss programs. *Medicine and Science in Sports and Exercise*, 32, 2130- 2145
- American College of Sports Medicine. (2001). Position Stand: Appropriate intervention strategies for weight loss and prevention of weight regain for adults. *Medicine and Science in Sports and Exercise*, 33, 2145-2156.
- American Dietetic Association. (2002). Position Statement: Weight management. *Journal of the American Dietetic Association*, 102(8), 1145-1154. Blair, S.N., & Brodney, S. (1999). Effects of physical inactivity and obesity on morbidity and mortality: current evidence and research issues. *Medicine and Science in Sports and Exercise*, 33(11), S646-


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Maternal & Child Nutrition

Course: BDN 5TH Sem

Subject Code: BDN 311

Theory Maximum Marks :	100	Credits :3
Internal Marks	40	
External Marks	60	

Unit I

Nutritional needs during pregnancy, common disorders of pregnancy (Anaemia, HIV infection, Pregnancy induced hypertension), relationship between maternal diet and birth outcome.

- Maternal health and nutritional status, maternal mortality and issues relating to maternal health.

Unit II

Nutritional needs of nursing mothers and infants, determinants of birth weight and consequences of low birth weight, Breastfeeding biology, Breastfeeding support and counselling

Unit III

Infant and young child feeding and care - Current feeding practices and nutritional concerns, guidelines for infant and young child feeding, Breast feeding, weaning and complementary feeding. Assessment and management of moderate and severe malnutrition among children, Micronutrient malnutrition among preschool children

Child health and morbidity, neonatal, infant and child mortality, IMR and UMR; link between mortality and malnutrition;

Unit IV

Overview of maternal and child nutrition policies and programmes.

RECOMMENDED READINGS

- Wadhwa A and Sharma S (2003). Nutrition in the Community-A Textbook. Elite Publishing House Pvt. Ltd. New Delhi.
- Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
- Bamji MS, Krishnaswamy K and Brahman GNV (Eds) (2009). Textbook of Human Nutrition, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mutliana, Ambala-133207

Subject Name: QUANTITY FOOD PRODUCTION & SERVICE

Course: BDN 5TH Sem

Subject Code: BDN 313

Theory Maximum Marks :	100	Credits :3
Internal Marks	40	
External Marks	60	

UNIT I

Aims and objectives of different food service outlets, (a) Industrial, (b) Institutional, (c) Hospitals. Different food and beverage outlets.

UNIT II

Menu planning – sequence of course- Indian (regional i.e. North Indian, South Indian, East Indian, and Gujratis, Western and others. Technique of writing menus (give exercises for planning menus) Types of meals – and styles of service – breakfast, lunch, dinner, afternoon tea, snacks (table d’hôte and a’la carte menu).

UNIT III

Beverages, alcoholic and non-alcoholic hot and cold.

Classification of beverages, use and importance in meals and snacks.

Suitable glassware for beverage service and five types of services of food and beverages.

UNIT IV

Staff organization of different outlets (a’la carte and table d’hôte), manager, hostess, supervisor, steward, waiter.

REFERENCE BOOKS/ JOURNALS:

1. T. Ramaswamy: Principles of Management, Himalaya Publication.
2. Livingston, G.E. (1979). Food Service Systems-Analysis, Design and Implementation Academic Press.
3. Powers, T. F. and Powers, T. M. (1984). Food Service Operations Planning and Control. John Wiley & Sons.
4. Buchanan, R. D; Armstrong, R. A; Merchant, P; Cleveland, E; Crabrec, S; Varge, E. A and Kozeluh, L. W. (1975). The Anatomy of Food Service Design. CAHNERS Books. CAHNERS Publ. Co. Inc.
5. Wood, C; Kluge, E. O; Annssem, P. E; Robinson, S; Golden, P; Cini, F. J; Eaton, W. V. (1978). The Anatomy of Food Service Design. C. B. I. Publishing Co Inc.
6. Boella, M. J. (1983). Personnel Management in the Hotel and Catering Industry. Hutchinson, London.
7. Drucker, P. S. (1975). Management. Allied Publishers. New Delhi. 8. Textbook of Food and Beverage Management by Sudhir Andrews, Tata Mc Graw Hill, New Delhi.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

BDN SIXTH SEMESTER

	Course Code	Course Title	Contact Hours		Weightage		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	BDN 302	Training Log Book/ Training Report	6 Months	100	-	100	10	Training Log Book/ Training Report
	BDN 304	Presentation		100	-	100	4	Presentation
	BDN 306	Viva – Voce		-	100	100	8	Viva - Voce
		Total	6 Months			300	22	Total


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Maharishi Markandeshwar University, Mullana Ambala

**M M INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS
MANAGEMENT (HOTEL MANAGEMENT)**

Scheme based on CBCS

**for
Bachelor of Hotel Management and Catering Technology (B.H.M.C.T.)**

**Duration: Four Years
(Semester System)**

Examinations, 2016-2017

CHOICE BASED CREDIT SYSTEM (CBCS)

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system.

Outline of Choice Based Credit System:

1. **Discipline Specific Core (DSC):** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Discipline Specific Core course.

2. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

2.1 **Discipline Specific Elective (DSE) Course:** Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute offers discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

2.2 **Dissertation/Project:** An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

3. **Ability Enhancement Courses (AEC):** The Ability Enhancement (AE) Courses may be of two kinds:

- i. **Ability Enhancement Compulsory Courses (AECC)** "AECC" courses are the courses based upon the content that leads to Knowledge enhancement; i. Environmental Science and ii. English/MIL Communication. These are mandatory for all disciplines
- ii. **Skill Enhancement Courses (SEC).** SEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

Introducing Research Component in Under-Graduate Courses

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 5 credits. A Project/Dissertation work is given in lieu of a discipline specific elective paper.


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Details of Course under BHMCT

Category	Course	Credits
Core	Discipline Specific Core (DSC)	
	i. 3 courses from 3 disciplines of choice	09X4= 36
	ii. Core Course Practical	
	3 courses from 1 discipline	03X2= 06
	6 courses from 2 discipline	06X1= 06
	iii. Practice School for industrial exposure	22
	iv. Industrial Training	22
Elective	Discipline Specific Elective (DSE)	
	i. 18 courses in different semesters	18X3= 54
	ii. 2 DSE Practicals in 4 th & 6 th Semester	02X2= 04
	iii. 3 DSE Practicals in 7 th Semester	
	iv. Project Report in 6 th Semester	03X1= 03 05
Ability Enhancement	i. Ability Enhancement Compulsory Course (AECC)	
	2 courses of 3 credits each	02X3= 06
	ii. Skill Enhancement Courses (SEC)	
	6 courses of 2 credits each	06X2= 12
Total Credits		176


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

FIRST SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	HM 101	Food Production Foundation -I	4	-	40	60	100	4
	HM 103	Food & Beverage Service Foundation -I	4	-	40	60	100	4
	HM 105	Accommodation & Front Office Operations Foundations -I	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	HM 101 Pr	Food Production Foundation -I	-	4	60	40	100	2
	HM 103 Pr	Food & Beverage Service Foundation -I	-	2	60	40	100	1
	HM 105 Pr	Accommodation & Front Office Operations Foundations -I	-	2	60	40	100	1
AECC	ES 101	Environmental science	3	-	40	60	100	3
SEC	HM 109	Applications of Computers in Hospitality & Tourism	2	-	40	60	100	2
DSE	HM 111	Fundamentals of Management	3	-	40	60	100	3
Total			20	8			900	24

SECOND SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	HM 102	Food Production Foundation -II	4	-	40	60	100	4
	HM 104	Food & Beverage Service Foundation -II	4	-	40	60	100	4
	HM 106	Accommodation & Front Office Operations Foundations -II	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	HM 102 Pr	Food Production Foundation -II	-	4	60	40	100	2
	HM 104 Pr	Food & Beverage Service Foundation -II	-	2	60	40	100	1
	HM 106 Pr	Accommodation & Front Office Operations Foundations -II	-	2	60	40	100	1
AECC	HM 108	Communication	2	2	40	60	100	3
SEC	HM 110	Foreign Language Skill - I (French)	2	-	40	60	100	2
DSE	HM 112	Basics of Nutrition	3	-	40	60	100	3
Total			19	10			900	24


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

THIRD SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	HM 201	Introduction to Indian Cookery	4	-	40	60	100	4
	HM 203	Food & Beverage Service Operations	4	-	40	60	100	4
	HM 205	Accommodation & Front Office Operations	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	HM 201 Pr	Introduction to Indian Cookery	-	4	60	40	100	2
	HM 203 Pr	Food & Beverage Service Operations	-	2	60	40	100	1
	HM 205 Pr	Accommodation & Front Office Operations	-	2	60	40	100	1
SEC	HM 207	Accounting Skills for Hospitality	2	-	40	60	100	2
DSE	HM 209	Choose Any Two	3	-	40	60	100	3
	HM211		3		40	60	100	3
Total			20	8			900	24

FOURTH SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
SEC	HM 202	Personality Skills For Hospitality	-	4	60	40	100	2
DSE Theory (Choose any one)	HM 204	a. Regional Cuisines of India -/ b. Food & Beverage Service Management -/ c. Accommodation Management-I	3	-	40	60	100	3
DSE Practical (As per theory)	HM 204 Pr	a. Regional Cuisines of India -/ b. Food & Beverage Service Management -/ c. Accommodation Management-I	-	4	60	40	100	2
DSE	HM206	Hospitality Marketing	3	-	40	60	100	3
DSE	HM208	Hospitality Laws	3	-	40	60	100	3
DSE	HM 210	Choose Any Two	3	-	40	60	100	3
	HM 212		3		40	60	100	3
Total			15	8			700	19


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

FIFTH SEMESTER									
	Course Code	Course Title	Evaluation Criteria	Contact Hours		Weight age		Total Marks	Credit
				Pr.		Internal	External		
Discipline Specific Core (DSC)	HM301	Practice School (Industrial Exposure)	Training Log Book/ Training Report	22 Weeks		100	-	100	22
	HM303		Presentation			100	-	100	
	HM305		Viva - Voce			-	100	100	
			Total	22 weeks				300	22

SIXTH SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
SEC	HM 302	Skill Enhancement for Media & Journalism in Hospitality	-	4	60	40	100	2
DSE Theory (Choose any one)	HM 304	a. Regional Cuisines of India -II/ b. Food & Beverage Service Management -II/ c. Accommodation Management-II	3	-	40	60	100	3
DSE Practical (As per theory)	HM 304 Pr	a. Regional Cuisines of India -II/ b. Food & Beverage Service Management -II/ c. Accommodation Management-II	-	4	60	40	100	2
DSE	HM 306	Project Report	-	10	-	100	100	5
DSE	HM 308	Researching for Hospitality & Tourism Management	3	-	40	60	100	3
DSE	HM 310	Choose Any Two	3	-	40	60	100	3
	HM 312		3	-	40	60	100	3
		Total	12	18			700	21


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

SEVENTH SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
SEC	HM 401	Communication & Soft Skills in Hospitality	2	-	40	60	100	2
DSE	HM 403	Human Resource Management	3	-	40	60	100	3
DSE	HM 405	Safety, Security & Travel Documentation	3	-	40	60	100	3
DSE	HM 407	Choose Any Three	3	-	40	60	100	3
	HM 409		3	-	40	60	100	3
	HM 411		3	-	40	60	100	3
DSE (Practical)	HM 407	Choose Any Three		2	60	40	100	1
	HM 409			2	60	40	100	1
	HM 411			2	60	40	100	1
		Total	17	6			900	20

EIGHTH SEMESTER								
	Course Code	Course Title	Evaluation Criteria	Contact Hours	Weight age		Total Marks	Credit
				Pr.	Internal	External		
Discipline Specific Core (DSC)	HM 402	Industrial Training	Training Log Book/ Training Report	22 Weeks	100	-	100	22
	HM 404		Presentation		100	-	100	
	HM 406		Viva - Voce		-	100	100	
			Total	22 weeks			300	22


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

BHMCT Elective Table (CBCS)

Discipline Specific Electives (DSE)						
Semester	Group X		Group Y			Group Z
	Code	Name	Code	Name	Code	Name
III	1	Principles of Baking	1	Business Etiquettes	1	Basics of Food Science
	2	Introduction to Tourism Concepts	2	Hotel Safety & Security	2	Hotel Engineering
	3	Commodities	3	Supervisory Management	3	Customer Relationship Management
IV	1	Confectionary	1	F&B Management & Control	1	Eco Tourism & Sustainable Development
	2	HACCP & Food safety	2	Professional Housekeeping	2	Financial Management
	3	Advance Cookery	3	Flower Arrangement	3	Facility Planning in Hotels
VI	1	Chocolate, Icing & sugar	1	Hotel Interior Decoration	1	Retail Management
	2	Kitchen Management	2	Room Division	2	Strategic Management
	3	Larder	3	Hotel Economics	3	Entrepreneurship Development
VII Choose any three	I	Laundry Management				
	II	Food Service Management				
	III	Accommodation Management				
	IV	Culinary Management				
	V	Bakery Management				
	VI	Front Office Management				
	VII	Event Management				
	VIII	Foreign Cuisine (Chinese and Italian)				

The student has to opt two subjects from group X/Y/Z (Choosing one from each). The Group choice will remain the same through out the course.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

FIRST SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Discipline Specific Core (DSC)	HM/HC 101	Food Production Foundation -I	4	-	40	60	100	4
	HM/HC 103	Food & Beverage Service Foundation -I	4	-	40	60	100	4
	HM/HC 105	Accommodation & Front Office Operations Foundations -I	4	-	40	60	100	4
Discipline Specific Core (DSC) Practical	HM/HC 101 Pr	Food Production Foundation -I	-	4	60	40	100	2
	HM/HC 103 Pr	Food & Beverage Service Foundation -I	-	2	60	40	100	1
	HM/HC 105 Pr	Accommodation & Front Office Operations Foundations -I	-	2	60	40	100	1
AECC	ES 101	Environmental science	3	-	40	60	100	3
SEC	HM/HC 109	Applications of Computers in Hospitality & Tourism	2	-	40	60	100	2
DSE	HM/HC 111	Fundamentals of Management	3	-	40	60	100	3
		Total	20	8			900	24


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Food Production Foundation –I Course: BHM&CT 1st Sem
Subject Code: HM/ HC 101

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1 Professional Kitchen & Cooking:** - Introduction, Definition, and its importance; Personal & Kitchen Hygiene, Uniform, Protective clothing, Kitchen Layouts(Basic, Bulk and Show kitchens), Hierarchy of Kitchen Department, Classical Kitchen Brigade, , Modern Staffing in various hotels, Duties & Responsibilities of various chefs in kitchen, their attributes; coordination of kitchen with other departments.
- Unit – 2 Kitchen Equipments, Fuels & Safety:** Kitchen Equipments, Classification, Description, Usage, Upkeep and Storage, Kitchen Tools, Knives, Their Usage, Care & Maintenance, Workstations, Safety Procedures, Fuel – Types, Usage and Precautions. Fire - Introduction, Types and handling fires and usage of extinguishers; Basic First Aid- Burns, Scalds, Cuts
- Unit – 3 Vegetable, Cuts & Cookery:** Introduction, Vegetables, Pigment and Colour Changes, Effect of Heat on vegetables, Cuts of Vegetables, nutritional and hygiene aspects. Some Indian Cuts on vegetables: Broccoli, Cabbage, Potatoes, Onions, Spinach, Cucumber, Tomatoes, avocado. Beetroot, French Beans, Gourd, Bottle Gourd, Pumpkin, Okra, Colocasia, Spinach, Carrot, Turnips
- Unit – 4 Methods of Cooking:** - Introduction, Definition, and its importance; Types- Baking, Broiling, Grilling, Frying, Steaming, Stewing, Poaching, Poeling, Roasting, Frying, Sautéing, Braising Cooking with Microwave, Ovens, Gas, Induction Plates and other such media. HACCP Standards and Professional Kitchens.

References:

- Accompaniments & Garnishes from waiter; Communicate: Fuller J. Barrie & Jenkins
- Cooking Essentials for the New Professional Chef
- Food Production Operations: Parvinder S Bali, Oxford University Press
- Larder Chef By M J Leto & W K H Bode Publisher: Butterworth- Heinemann
- Modern Cookery (Vol- I) By Philip E. Thangam, Publisher: Orient Longman
- Practical Cookery By Kinton & Cessarani
- Practical Professional Cookery By Kauffman & Cracknell
- Professional Cooking by Wayne Gislen, Publisher Le Cordon Bleu
- Purchasing Selection and Procurement for the Hospitality Industry By Andrew Hale Feinstein and John M. Stefanelli
- The Professional Chef: Le Rol A. Polsom
- Theory of Catering By Kinton & Cessarani
- Theory of Cookery By K Arora, Publisher: Frank Brothers


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

**Subject Name: Food & Beverage Service Course: BHM&CT 1st Sem
Foundation –I**

Subject Code: HM/ HC 103

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1 Food and Beverage Services:** - Introduction, Concept, and Classification of Catering Establishments, their importance; Personal Hygiene, Uniform & Grooming Standards, F&B Service Outlets & Familiarisation with their Layouts(Tea Lounge, Coffee Shop, Restaurant, Banquets, Staff Cafeteria), Hierarchy of F&B Service Department, F&B Service Brigade, Modern Staffing in various hotels, Duties & Responsibilities of various employees in F&B Service, their attributes; coordination of F&B Service with other departments.
- Unit – 2 Food Service Equipments, Fuels & Safety:** Food Service Equipments, Classification, Description, Usage, Upkeep and Storage, Food Service Tools, Their Usage, Care & Maintenance, Side Stations, Safety Procedures, Fuel – Types, Usage and Precautions while Food Service. Fire, Safety & Emergency Procedures – Introduction, Types and handling fires and dealing with emergencies.
- Unit – 3 Food Service -1:** Table Crockery, Cutlery, Glassware (Bar Glassware not included) Condiments, Sweeteners, Menu – Concept, Types, Salient Features, Menu Designs, Presenting of Menu, Layout of Table, Napkin Folding (At least Ten Types), Receiving and Greeting the Guests.
- Unit – 4 Food Service-II :** Introduction, Classification of Services, Usage and Service Methods, Preparation for Services, Mise-en-place and Mise-en-scene, arrangement and setting up of station, Par stocks maintained at each side station, Functions performed while holding a station, Method and procedure of taking a guest order, emerging trends in Food Services and salient features.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Accommodation & Front Office Course: BHM&CT 1st Sem
Operations Foundation –I
Subject Code: HM/ HC 105

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

Unit – 1 Accommodation Sector: - Introduction, Concept, and its importance; Types & Classification of Hotels on different basis; Star Categorization, Heritage Hotels and others in India, Organisation Structure of Hotels; Origin, growth and development of Hotel Sector in India.(ITC, The Taj Group, The Oberoi Group), Foreign Hotel Chains in India – Hilton, Marriott, Hyatt

Unit – 2 The Guest Accommodation: Guest Rooms, Types, Layouts, Salient Features, Description, Guest Room amenities, supplies and services, Floors, Room Name List Patterns, Guest Elevators, Floor Pantries, Guest Safety on Floors, Guest Safety Procedures during Fire, emergencies

Unit – 3 Hotel Front Office : Front Office Introduction, Functions and its importance, Different sections of the front office department and their layout and importance – Reservation, Reception, Concierge, Bell desk, Lobby, Telephones, Cashier, Inter and Intra- department coordination. Organisation structure of Front Office, Key Responsibilities, Job Descriptions, Attributes of Front Office Personnel, Uniform and Grooming Standards.

Unit – 4 Hotel Housekeeping: Introduction, Meaning and definition Importance of Housekeeping, Sections of Housekeeping, Responsibilities of the Housekeeping department, a career in the Housekeeping department. Housekeeping Department: Organizational framework of the Department (Large/Medium/Small Hotel), Role' of Key Personnel in Housekeeping, Job Description and Job Specification of staff in the department, Attributes and Qualities of the Housekeeping staff – skills of a good Housekeeper, Inter departmental Coordination with more emphasis on Front office and the Maintenance department, Hygiene and Grooming Standards of Housekeeping Personnel


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Food Production Foundation –I Course: BHM&CT 1st Sem
Subject Code: HM/ HC 101 (Pr)

Theory Maximum Marks : 100	Credits :2
Internal Marks	60
External Marks	40

Practical

- ❖ Understanding Personal Hygiene & Kitchen Hygiene
- ❖ Grooming for Professional Kitchen – Do's & Don't's
- ❖ Understanding kitchen Layouts.
- ❖ Familiarisation with kitchen equipments and tools
- ❖ Fuels –Their usage and precautions
- ❖ Kitchen First Aid
- ❖ Handling Fire
- ❖ Understanding Methods of Cooking & HACCP Standards
- ❖ Cooking in Professional Kitchen – Do's & Don't's
- ❖ Vegetables –Their usage and cooking precautions
- ❖ Cuts of vegetables
 - Julienne
 - Jardiniere
 - Dices
 - Cubes
 - Macedoine
 - Paysanne
 - Shredding
 - Mire- poix
- ❖ Blanching of Tomatoes and Capsicum.
- ❖ Cooking vegetables:
 - Boiling (potatoes, peas)
 - Frying (Aubergine, Potatoes)
 - Steaming (Cabbage)
 - Braising (Potatoes)
- ❖ Braising (Onions, cabbage) Simple Vegetable and Meat Cookery
- ❖ Identification of types of rice varieties & pulses.
- ❖ Simple preparation of Boiled rice (Draining & Absorption) method.
- ❖ Fired rice.
- ❖ Simple dal preparation
- ❖ Wheat, products like making chapattis, parathas, phulkas, Kulchas & puris.
- ❖ Simple Breakfast Preparations:
 - ❖ Preparation of Puri/ Bhaji, Allo Paratha, Chola Bhatara,
 - ❖ Preparation of Continental Breakfast


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Food & Beverage Service Course: BHM&CT 1st Sem
Foundation –I
Subject Code: HM/ HC 103 (Pr)

Theory Maximum Marks : 100		Credits :1
Internal Marks	60	
External Marks	40	

Practical

- ❖ Understanding Personal Hygiene & Food Service Hygiene
- ❖ Grooming for Professional Food Service – Do's & Don't's
- ❖ Understanding Food Service Outlets.
- ❖ Familiarisation with Food Service equipments and tools
- ❖ Fuels –Their usage and precautions while dealing with them in F&B Outlets
- ❖ Handling Fire and Emergency Procedures
- ❖ Familiarization, identification of crockery, cutlery, hollowware, flatware and tableware in F&B Outlets
- ❖ Services of Soups (Minestrone, Consommés, Cream Soups, Puree Soups, Clear Soups, Bisques, Cold Soups, Chowders and others)
- v Understanding Service Methods, Setting up of Side Station, Table Layouts, Napkin Folding and Presenting Menus.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Accommodation & Front Office Course: BHM&CT 1st Sem
Operations Foundation –I
Subject Code: HM/ HC 105 (Pr)

Theory Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

- ❖ Understanding Personal Hygiene Grooming Standards
- ❖ Understanding Layouts of Front Office and Housekeeping.
- ❖ Familiarisation with equipments and tools
- ❖ Rooms layout and standard supplies. (Amenities)
- ❖ DO'S and Don'ts for new entrants/employees in the front office
- ❖ Hotel terminology

Note: For focused inputs of accommodation the practical hours may be split up i.e first Two for Front Office and next Two for Housekeeping, thus completing 4 practical lab hours per week of two credit equivalence.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Application of Computers
in Hospitality & Tourism**

Course: BHM&CT 1st Sem

Subject Code: HM/ HC 109

Theory Maximum Marks : 100	Credits :2
Internal Marks	40
External Marks	60

Unit I : Introduction to Computers: Introduction to Computer: Classification, Generations, Organization, Capabilities Characteristics & Limitations, Application of Computer in Hotels, Familiarisation with Components of Computers – Hardware: Hardware elements – input, storage, processing & output devices. Block diagram of computer,

Unit II: Introduction to Computers Software: Types of Software, System Software, Application Software, Utility Software's, Use of MS- Office: Basics of MS- Word. MS- Excel and MS-Power Point

Unit III: Internet & Applications: Introduction to Internet: Definition of networks, concepts of web page, website and web searching (browsing). Benefits, Application, Working, Hardware and Software requirements, World Wide Web, Web Browser, URL, Search Engines, Email

Unit IV: Social Media Applications and Hospitality: Introduction to Social Media, Its Role in Hospitality Promotion, Facebook – Creating Pages and Profiles, Merits/Demerits of Social Media, Linked In, Twitter and Other Social Media Applications.

Suggested Reading:

- Leon & Lion, Introduction to Computers, Vikas Publishing House, New Delhi
- June Jamrich Parsons, Computer Concepts 7th Edition, Thomson Learning, Bombay.
- Comer 4e, Computer networks and Internet, Pearson Education
- White, Date Communications & Compute4r Network, Thomson Learning, Bombay.
- Computers in Hotels – Concepts & Applications : Partho P Seal Oxford University Press


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Fundamentals of Management
Subject Code: HM/ HC 111

Course: BHM&CT 1st Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Nature of Management:** Meaning & Definition, Characteristics, Importance, Management: A Science or Art, Principles & Levels of Management, Management Functions & Development of Management
- Unit 2** **Planning & Organizing:** Meaning, Definitions, features, Types of Plans & Planning Force, Importance of planning, Decision Making process, Concept, Rationality in decision making, Forecasting and its importance, Delegation of Authority its meaning and importance, Coordination – Definition need and importance.
- Unit 3** **Staffing & Directing:** Meaning, Recruitment its sources & Selection its STEPS, Training & NEED AND METHODS, Directing: Meaning elements and importance
- Unit 4** **Leadership & Managerial Control:** Leadership: Meaning, definitions, importance and qualities. Controlling – Meaning, definition, importance and Process.

References:

- Principles & Practice of Management; C B Gupta
- Principles of Management; P C Tripathi, P N Reddy
- Principles & Practice of Management, L M Prasad


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

SECOND SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Compulsory Theory	HM 102	Food Production Foundation –II	4	-	40	60	100	4
	HM 104	Food & Beverage Service Foundation –II	4	-	40	60	100	4
	HM 106	Accommodation & Front Office Operations Foundations –II	4	-	40	60	100	4
	HM 110	Foreign Language Skill (French)	3	-	40	60	100	3
	HM 112	Basics of Nutrition	3	-	40	60	100	3
	HM 114	Fundamentals of Management	3	-	40	60	100	3
Compulsory Practical	HM 102 Pr	Food Production Foundation –II	-	4	60	40	100	2
	HM 104 Pr	Food & Beverage Service Foundation –II	-	2	60	40	100	1
	HM 106 Pr	Accommodation & Front Office Operations Foundations –II	-	2	60	40	100	1
		Total	21	8			900	25


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Food Production Foundation –II Course: BHM&CT 2nd Sem
Subject Code: HM 102

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1 Ingredients used in cooking:** Herbs & Spices, Cereals and Pulses, Fruits and Vegetables, and Salt, Sweeteners, Fat, Milk and Milk Products: - Introduction, Types, Purchasing, Storing Considerations and their key uses in kitchen
- Unit – 2 Eggs, Poultry and Meat:** Eggs – Introduction, Usage in Kitchen, Structure of Egg, Classification, Grading of Eggs, Types, Selection, Storage and preparation of breakfast dishes with eggs. Poultry and Game: Introduction, Classification, Selection Criterion, Cuts of Poultry, Yield and simple Indian preparations. Meat: Characteristics, selection and grading, Classification (Bovines, Ovines and Swines), Categories, Cuts of Meat, Storage and handling.
- Unit – 3 Fishes in cooking:** Introduction, Types, Purchasing, Storing Considerations, Fish & Shellfish, Their Classification, Cuts of Fish, Popular Species of Fish, Classical Preparations of Fish, Common cooking methods used for sea food.
- Unit – 4 Stocks, Sauces, Soups and Salads:** Stocks: Introduction, Classification, Usage, Preparation; Sauces: Introduction, Classification, Usage, Thickening Agents, Preparation of Mother Sauces, Understanding their derivatives, propriety sauces, making of good sauce, emerging trends, Soups: Introduction, Classification, Preparation, Salient Features, Care and precautions, trends in soup presentation. Salads: Introduction, compositions, types, dressings, emerging trends.

References:

- Accompaniments & Garnishes from waiter; Communicate: Fuller J. Barrie & Jenkins
- Cooking Essentials for the New Professional Chef
- Food Production Operations: Parvinder S Bali, Oxford University Press
- Larder Chef By M J Leto & W K H Bode Publisher: Butterworth- Heinemann
- Modern Cookery (Vol- I) By Philip E. Thangam, Publisher: Orient Longman
- Practical Cookery By Kinton & Cessarani
- Practical Professional Cookery By Kauffman & Cracknell
- Professional Cooking by Wayne Gislen, Publisher Le Cordon Bleu
- Purchasing Selection and Procurement for the Hospitality Industry By Andrew Hale Feinstein and John M. Stefanelli
- The Professional Chef: Le Rol A. Polsom
- Theory of Catering By Kinton & Cessarani
- Theory of Cookery By K Arora, Publisher: Frank Brothers


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

**Subject Name: Food & Beverage Service
Foundation –II**

Course: BHM&CT 2nd Sem

Subject Code: HM 104

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1 **Non Alcoholic Beverages & Mocktails:**** Introduction, Types (Tea, Coffee, Juices, Aerated Beverages, Shakes) Descriptions with detailed inputs, their origin, varieties, popular brands, presentation and service tools and techniques. Mocktails – Introduction, Types, Brief Descriptions, Preparation and Service Techniques
- Unit – 2 **Coffee Shop & Breakfast Service:**** Introduction, Coffee Shop, Layout, Structure, Breakfast: Concept, Types & classification, Breakfast services in Hotels, Preparation for Breakfast Services, Mise-en-place and Mise-en-scene, arrangement and setting up of tables/ trays, Functions performed while on Breakfast service, Method and procedure of taking a guest order, emerging trends in Breakfast Services and salient features.
- Unit – 3 **Food and Beverage Services in Restaurants:**** - Introduction, Concept of Restaurant, Types of Restaurants, their salient features; Set up of Restaurants and their Layouts, Restaurant Teams Organisational Structure, Modern Staffing in various hotels, Method and procedure of receiving guests, taking guest orders, Service equipment used and its maintenance, Coordination with housekeeping for soil linen exchange, Physical inventory monthly of crockery, cutlery, linen etc., Equipment, furniture and fixtures used in the restaurant and their use and maintenance, Theme and Speciality Restaurants, Celebrity Restaurants.
- Unit – 4 **Room Service/ In Room Dining:**** Introduction, Concept of Room Service/ In Room Dining, Their Salient Features, Understanding Guest expectations in Room Service, Room Service Equipments, Set up of Trays & Trolleys, Upkeep and Storage, Service Tools, Clearance, Presentation of Bills, Room Service Dos & Don'ts. Mini Bar Management in Guest Rooms, Guest Interaction – Have and Have not's.

Reference:

- Food & Beverage Service – Dennis R.Lillicrap. & John A. Cousines. Publisher: ELBS
- Food & Beverage Service – Sudhir Andrews, Tata Mc Graw Hill.
- Food & Beverage Service Lillicrap & Cousins, ELBS
- Introduction F & B Service- Brown, Heppner & Deegan
- Modern Restaurant Service- John Fuller, Hutchinson
- Professional Food & Beverage Service Management – Brian Varghese
- The Restaurant (From Concept to Operation)


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Accommodation & Front**Course: BHM&CT 2nd Sem****Office Operations Foundation –II****Subject Code: HM 106**

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1** **Cleaning Science:** Cleaning Agents, Characteristics of a good cleaning agent, PH scale, Types of cleaning agent, cleaning products (Domestic and Industrial), Cleaning Equipment: Types of Equipment, Operating Principles, Characteristics of Good equipment (Mechanical/Manual), Storage, Upkeep, and Maintenance of equipment, Care and Cleaning of Different Surfaces: Metal, Glass, Leather, Rexene, Ceramic, Wood, Wall and floor covering, Stain Removal.
- Unit – 2** **Housekeeping Procedures:** Cleaning Schedules, Cleaning Methods, Briefing, Debriefing, Proceeding for Days work, Keys & Their Classification, Inventory of Housekeeping Items, Indenting from Stores, Housekeeping control desk: Importance, Role, Co-ordination, check list, key control. Handling Lost and Found, Forms, Forms and registers used in the Control Desk, Paging systems and methods, Handling of Guest Requests, General operations of control desk.
- Unit – 3** **Basic Front Office Operations:** Front desk operations & functions, Equipments used at front office – Room Rack, Mail Message, and Key Rack, Reservation Racks, Information Rack, Folio Trays, Account Posting Machine, Voucher Rack, Cash Register Support Devices, Telecommunications Equipments, rooms and plans, Basis of Room charging, Tariff fixation, Introduction to the guest cycle, Reservation: Concept, importance, types, channels and systems, Procedure of taking reservation, Overbooking, amendments and cancellations, Group Reservation: Sources, issues in handling groups. Procedure for guest check in, and baggage handling,
- Unit – 4** **The Guest Room Servicing:** Cleaning of Guest Rooms & Bathrooms: Daily cleaning of (Occupied/ Departure/ Vacant/ Under Maintenance/VIP rooms (Systematic Procedures), Special Cleaning, Weekly Cleaning /Spring Cleaning, Evening service/ Turn Down Service, System & procedures involved, Forms and Formats, Replenishment of Guest supplies and amenities, Use of Maids Cart & Caddy.

References:

- Hotel Hostel and Hospital Housekeeping – Joan C Branson & Margaret Lennox (ELBS).
- Hotel House Keeping – Sudhir Andrews Publisher: Tata Mc Graw Hill.
- Hotel Housekeeping Operations & Management – Raghubalan, Oxford University Press.
- Housekeeping and Front Office – Jones
- Managing Housekeeping Operations – Margaret Kappa & Aleta Nitschke
- Professional Management of Housekeeping Operations (II) Edn.) – Rohert J. Martin & Thomas J.A. Jones, Wiley Publications
- Security Operations By Robert Mc Crie, Publishe: Butterworth – Heinemann
- The Professional Housekeeper – Tucker Schneider,; Wiley Publications
- Front Office Training manual – Sudhir Andrews. Publisher: Tata Mac Graw Hill
- Managing Front Office Operations – Kasavana & Brooks Educational Institution AHMA
- Front Office – Operations and management – Ahmed Ismail (Thomson Delmar).
- Managing Computers in Hospitality Industry – Michael Kesavana & Cahell.
- Front Office Operations – Colin Dix & Chris Baird.
- Front Office Operation Management- S.K Bhatnagar, Publisher: Frank Brothers
- Managing Front Office Operations By Kasvan & Brooks


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Foreign Language Skill - French Course: BHM&CT 2nd Sem
Subject Code: HM 110

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1 Introduction to basic French:** The alphabets, Use of Capital letter, The accents in French, Liason, The Vowels & consonant Elision.
- Unit 2 French grammar**
- Le, La, Les; un, une, des and their usage with common nouns e.g. the table, the chair, a wall, a window etc.
 - Counting Numbers Ordinal & Cardinal: 1-100; 1st-100th.
 - Common adjectives – e.g. Grand/Petit/Haut/Bas etc.
 - The days of the seasons, weeks & months of the year in French.
 - Les professions (le médecin etc.)
 - viles noms de pays (Angleterre, Allemande, Espagne, Inde, etc.)
 - Quelle heure est-il?(Time of the day)
- Unit 3 Vocabulary & comprehension**
- Kitchen utensils, Kitchen ingredients Translation of French menu terms in breakfast
 - Common greetings and frequently used phrases (Short phrases).
 - Learning complaint handling in French
 - Conjugation (Affirmative and Negative) –er ending regular verbs + the verbs être and avoir (present indicative tense). The verb ‘aller’; boire; server, faire, prendre, finir, voir, lire, dire.
 - Writing short phrases for ordering breakfast. Between 2 persons
- Unit 4 Coversations:** Basic Conversation, translation and practicing of various French Terms used in Restaurant and Front Office

References:

- Cours de langue et de civilization francaise- G. Mauger
- Parlez a l hotel – A.Talukdar
- French for Hotel & Tourism : Bhattacharya


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Basics of Nutrition
Subject Code: HM 112

Course: BHM&CT 2nd Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Basic aspects of Food:** Introduction, Food terminology, Importance and functions of food, Functional food groups, Relationship between nutrition, health & diseases
- Unit 2** **Energy:** Definition of energy & its measurements, Factors affecting energy requirements, Basal metabolism (BMR)
- Unit 3** **Essential food nutrients – Classification, Sources, Functions, RDA.:** Carbohydrates, Proteins, Oils and fats, Minerals (Sodium, Calcium, Iron, Fluorine), Water, Vitamins
- Unit 4** **Concepts of Balanced diet & Meal Planning:** Definition & its importance., RDA for various nutrients- age, gender, physiological stage, Introduction to Meal Planning & its importance., Factors influencing Meal Planning.

Reference

- Food Science by N. Srilakshmi
- Food facts & principles by N. Shakuntala Manay
- Nutrition for food service & Culinary professionals by Karen Eich Drummond & Lisa M. Brefere
- Nutrition Science by B. Sri Lakshmi
- Food Theory & Applications by Jane Bower


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Fundamentals of Management
Subject Code: HM 114

Course: BHM&CT 2nd Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Nature of Management:** Meaning & Definition, Characteristics, Importance, Management: A Science or Art, Principles & Levels of Management, Management Functions & Development of Management
- Unit 2** **Planning & Organizing:** Meaning, Definitions, features, Types of Plans & Planning Force, Importance of planning, Decision Making process, Concept, Rationality in decision making, Forecasting and its importance, Delegation of Authority its meaning and importance, Coordination – Definition need and importance.
- Unit 3** **Staffing & Directing:** Meaning, Recruitment its sources & Selection its STEPS, Training & NEED AND METHODS, Directing: Meaning elements and importance
- Unit 4** **Leadership & Managerial Control:** Leadership: Meaning, definitions, importance and qualities. Controlling – Meaning, definition, importance and Process.

References:

- Principles & Practice of Management; C B Gupta
- Principles of Management; P C Tripathi, P N Reddy
- Principles & Practice of Management, L M Prasad


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Food Production Foundation –II Course: BHM&CT 2nd Sem
Subject Code: HM 102 Pr

Practical Maximum Marks : 100	Credits :2
Internal Marks	60
External Marks	40

Practical

- ❖ Preparation of Stocks, Mother Sauces and at least two derivatives each.
- ❖ Preparation of Soups (Minestrone, Consommés, Cream Soups, Puree Soups, Clear Soups, Bisques, Cold Soups, Chowders and others)
- ❖ Cooking in Professional Kitchen – Do's & Don't's
- ❖ Understanding Eggs and their simple Breakfast Preparations ; Preparation of:
 - Hard & soft boiled eggs.
 - Fried eggs.
 - Poached eggs.
 - Scrambled eggs.
 - Omelet's (Plain, Spanish, Stuffed)
- ❖ Familiarisation with, Poultry, Meats & Fishes – Their Simple Cuts and Cooking.
- ❖ Fried Rice
- ❖ Simple dal preparation
- ❖ Simple Vegetable and Meat Cookery
- ❖ Identification of types of rice varieties & pulses.
- ❖ Simple preparation of Boiled rice (Draining & Absorption) method.
- ❖ Fried rice.
- ❖ Simple dal preparation
- ❖ Wheat, products like making chapattis, parathas, phulkas, Kulchas & puris.
- ❖ Simple Breakfast Preparations:
- ❖ Preparation of Puri/ Bhaji, Allo Paratha, Chola Bhatura,
- ❖ Preparation of Continental Breakfast


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Food & Beverage Service
Foundation II**

Course: BHM&CT 2nd Sem

Subject Code: HM 104 Pr

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

1. Understanding Non Alcoholic Beverages, Types & Service Techniques
2. Guest Interactions while on Food Service – Do's & Don't's
3. Understanding Mocktails, Their Presentation and Services (At least ten types of Mocktails)
4. Breakfast Services: Types, Breakfast Layouts, Menu Knowledge, Table Services, Clearance & Acknowledging guests.
5. Familiarisation with Food Service in Restaurants (Receiving Guests, Table Layouts, Complimenting them, Presentation of Bills, Dealing with in house/ residential guests)
6. Restaurant Services – Their salient features, Table Layouts, Presenting Menus, precautions while dealing with guests, Commitments with guests, Food Pickup Procedures, Clearance and Dishwashing Procedures
7. Room Service Practical, Taking of Orders, Delivery of Food Services, Identifying Room Service Equipment, Importance of Menu Knowledge for Order-taking (RSOT functions/procedures), Food Pickup Procedure, Room service Layout Knowledge, Laying of trays for various orders, Pantry Elevator Operations, Clearance Procedure in Dishwashing area, Room service Inventories and store requisitions


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Accommodation & Front Office
Operations Foundation II**

Course: BHM&CT 2nd Sem

Subject Code: HM 106 Pr

Practical Maximum Marks : 100	Credits : 1
Internal Marks	60
External Marks	40

Practical

1. Identification and familiarisation with cleaning equipments and agents.
2. Cleaning of different surfaces e.g. windows, tabletops, picture frames under beds, on carpet, metal surfaces, tiles, marble and granite tops.
3. Develop an understanding about basic Housekeeping procedures like Briefing, De Briefing, dealing with Lost & Found, Key Control, Forms & Registers at Control desk of Housekeeping
4. Identification and familiarisation with front desk equipments and Performa's.
5. Skill to handle front desk operations i.e guest reservations, guest arrival (FIT and groups) including baggage handling
6. Skills to handle to telephones at the reception- receive/ record messages.
7. Skills to handle guest departure (fits and groups)
8. Preparation and study of countries, capitals, currencies, airlines and flags chart
9. Role play:
 - a. At the porch, Guest driving in Doorman opening the door and saluting guest; Calling bell boy
 - b. At the Front Desk: Guest arriving; greeting & offering welcome drink and guest interactions.
 - c. Servicing of guestrooms, placing/ replacing guest supplies and soiled linen


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

THIRD SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Compulsory Theory	HM 201	Introduction to Indian Cookery	4	-	40	60	100	4
	HM 203	Food & Beverage Service Operations	4	-	40	60	100	4
	HM 205	Accommodation & Front Office Operations	4	-	40	60	100	4
	HM 207	Accounting Skills for Hospitality	3	-	40	60	100	3
Compulsory Practical	HM 201 Pr	Introduction to Indian Cookery	-	4	60	40	100	2
	HM 203 Pr	Food & Beverage Service Operations	-	2	60	40	100	1
	HM 205 Pr	Accommodation & Front Office Operations	-	2	60	40	100	1
Elective	HM 209 BHM211	Choose Any Two	3	-	40	60	100	3
			3	-	40	60	100	3
Total			21	8			900	25

Electives						
Semester	Group X		Group Y			Group Z
	Code	Name	Code	Name	Code	Name
III	1	Principles of Baking	1	Business Etiquettes	1	Basics of Food Science
	2	Introduction to Tourism concepts	2	Hotel Safety & Security	2	Hotel Engineering
	3	Commodities	3	Supervisory Management	3	Customer Relationship Management

The student has to opt two subjects from group X/Y/Z (Choosing one from each). The Group choice will remain the same through out the course.


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Introduction to Indian Cookery
Subject Code: HM 201

Course: BHM&CT 3rd Sem

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1** **Indian Cooking:** - Introduction, Philosophy of Indian Food, The great Indian Cuisine – Key features, Regional influences on Indian Food, Popular foods of India (At least one simple three course menu from each region of India , North, East, South, West and Central India its salient features and cooking).
- Unit – 2** **Condiments, Herbs and Spices Used in India Cuisine:** Introduction, Condiments, Herbs and Spices used in Indian Cuisine (Allspice, Ajowan, Aniseed, Asafoetida, Bay leaf, Cardamom, Cinnamon, Cloves, Coriander seeds, Cumin, Chilli, Fenugreek, Mace, Nutmeg, Mustard, Pepper, Poppy Seeds, Saffron, Tamarind, Turmeric, Celery, Curry Leaf, Marjoram, Pomegranate Seeds, Stone Flowers, Basil, Betel Root, Black Salt, Red Chilli, Rock Salt) Various ways of using spices, their storage and usage tips.
- Unit – 3** **Masalas, Pastes and Gravies in Indian cooking:** Masalas and Pastes: Introduction, Types, Blending of Spices, Concept of Dry and Wet Masalas, Pastes used in Indian Cooking, Purchasing, Storing Considerations. Basic Indian Gravies: Introduction, Gravies and Curries, Regional Gravies, Gravy Preparations.
- Unit – 4** **Commodities and their usage in Indian Kitchens:** Introduction, Souring Agents, Colouring Agents, Thickening Agents, Tendering Agents, Flavouring and Aromatic Agents, Spicing Agents in Indian Kitchens

References:

- Food Production Operations: Parvinder S Bali, Oxford University Press
- Larder Chef By M J Leto & W K H Bode Publisher: Butterworth- Heinemann
- Modern Cookery (Vol- I) By Philip E. Thangam, Publisher: Orient Longman
- Practical Cookery By Kinton & Cessarani
- Practical Professional Cookery By Kauffman & Cracknell
- Theory of Catering By Kinton & Cessarani
- Theory of Cookery By K Arora, Publisher: Frank Brothers


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Food & Beverage
Service Operations**
Subject Code: HM 203

Course: BHM&CT 3rd Sem

Theory Maximum Marks : 100		Credits :4
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit – 1** Restaurant Planning: Introduction, Planning & Operating various F & B Outlets and support, ancillary areas, Factors- Concept, Menu, Space & Lighting, Colors and Market, Restaurant Design team. Restaurant Problems and Guest Situation Handling – (thumb rules), Hosting Theme Functions/ Lunches/Events, Preparation of Flamb'es & Gueridon Service
- Unit – 2** Buffet: Introduction, Types, Buffet Sectors, Equipments Used, Factors, Space requirements & Checklist, Buffet Presentation, menu planning, staff requirement, Buffet Management. Function Catering: Introduction, Types of Function, Function Administration & Organization- Booking Procedure, Menus, Function contracts, Seating Arrangements. Other Catering Operations: Off- Premises Catering, Hospital Catering, Industrial & Institutional Catering, Airline & Railway catering, Home Delivery, Take away, Afternoon & High Teas: Introduction, Menu, Cover & Service.
- Unit – 3** F & B Control- Overview: Introduction, Objectives of F & B Control, Problems in F & B Control, Methodology of F & B Control, Personnel Management in F & B Control. Cost & Sales Concepts: Definition of Cost, Elements of Cost, Classification of Cost, Sale defined, Ways of expressing sales concepts. Cost Volume/ Profit Relationships (Bread- even analysis).
- Unit – 4** Budgetary Control: Introduction, Objectives, Kinds of Budget, Budgetary Control Process Stages in the preparation of Budgets. Budgeting for F & B Operations Food & Beverage Control: Purchasing Control, Receiving Control, Storing and Issuing Control, Menu Management: Introduction, Types of Menu Planning Considerations & Constraints, Menu Costing and Pricing, Menu Merchandising, Menu Engineering, Menu Fatigue, Menu as a In- House Marketing, Tool.

References

- Financial & Cost control techniques in hotel & Catering Industry – Dr J.M.S. Negi
- Food & Beverage Control By: Richard Kotas and Bernard Davis
- Food & Beverage Cost Control- Lea R Dopson, Wiley Publishers.
- Food & Beverage Management By: Bernard Davis & Stone
- Food & Beverage Service- Dennis R. Lillicrap. & John.A. Cousins. Publisher: ELBS
- Food & Beverage Service Management- Brian Vargese
- Food & Beverage Service Training Manual- Sudhir Andrews, Tata Mc Graw Hill.
- Hotel & Catering Costing & Budgets, RD. Boardman, Heinemann
- Introduction F & B Service- Brown, Heppner & Deegan


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

Subject Name: Accommodation & Front Office Operations

Course: BHM&CT 3rd Sem

Subject Code: HM 205

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1** **Cleaning of Public Areas:** Cleaning of Public Areas: Cleaning Process, Cleaning and upkeep of Public areas, (Lobby, Cloak rooms/ Restaurant/ bar/ banquet Halls/ Administration offices/ Lifts and Elevators/ Staircase/ back areas/ Front areas/ Corridor), Pest Control: Types of pests, Control procedures, Safeguarding Assets: Concerns for safety and security in Housekeeping operations, Concept of Safeguarding assets.
- Unit – 2** **Special Provisions for Guests, Safety, Security and First Aid:** Guest room features for differently abled – added features and modifications, Public Areas: Wash – rooms, restaurants, main entrance etc. added features and modifications. Situation Handling/ Service Design, for typical Market Segment (Safety, security & Comfort); Airlines crew guest rooms, single lady guests, Children. The Concept and Importance, Safety: Accidents, Fires (Cause, Procedure, Accident report form), Security: Security of Guest/ Staff/ Public areas/ Rooms/ Back office areas, First Aid: Concept and Emergency Procedures (Heart Attack, Fits, Burns, Fainting, Fractures, Scalds, Artificial respiration
- Unit – 3** **The Guest Stay with Hotel:** Registration: concept, systems and its procedure, Registration form and C Form, No Shows, Rooming of Guests, Message Handling, Dealing with Guests Requests and Complaints, Travel Desk and Concierge: functions; luggage, paging, message and left luggage handling procedure, foreign currency handling, Room selling techniques, Communicating with guests.
- Unit – 4** **The Guest Departure and Post Departure Services at Front Desk:** The guest accounting, the guest ledgers, city ledger, tips and advances, front office cash sheet, paid out, bank net receipts, over and shorts, settlement of bills, credit card handling, handling vouchers of – room rate, food sales, laundry, other guest services, miscellaneous charges, credit security measures, cash and credit control, express check out, early and late check outs, group departures, post departure courtesy services

References:

- Hotel Hostel and Hospital Housekeeping – Joan C Branson & Margaret Lennox (ELBS).
- Hotel House Keeping – Sudhir Andrews Publisher: Tata Mc Graw Hill.
- Hotel Housekeeping Operations & Management – Raghubalan, Oxford University Press.
- Housekeeping and Front Office – Jones
- Managing Housekeeping Operations – Margaret Kappa & Aleta Nitschke
- Professional Management of Housekeeping Operations (II) Edn.) – Rohert J. Martin & Thomas J.A. Jones, Wiley Publications
- Security Operations By Robert Mc Crie, Publishe: Butterworth – Heinemann
- The Professional Housekeeper – Tucker Schneider,; Wiley Publications
- Front Office Training manual – Sudhir Andrews. Publisher: Tata Mac Graw Hill
- Managing Front Office Operations – Kasavana & Brooks Educational Institution AHMA
- Front Office – Operations and management – Ahmed Ismail (Thomson Delmar).


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

Subject Name: Accounting Skills for Hospitality
Subject Code: HM 207

Course: BHM&CT 3rd Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1** Accounting: Business Transaction and Basic Terminology, Need to Study Accounting, Accounting functions, Purpose of Accounting Records, Accounting Principles – Concepts and Conventions.
- Unit – 2** Account Records: Principles of Double Entry System, Journal Entries, Ledger, Subsidiary Books – Cash, Sales & Purchase books, Bank Reconciliation statement.
- Unit – 3** Financial Statement: Basic Financial Statements, Trial Balance, Preparation of Final Accounts, Basic Adjustments to final Accounts, Methods of Presenting Final Accounts Practical Problem,
- Unit – 4** Depreciation Reserves and Provisions – Meaning, basic Methods, Computer Application- Preparation of Records and Financial Statements

Reference:

- Hospitality Management Accounting, Michael M Coltman
- Hotel Accountancy & Finance – S.P. Jain & K.L. Narang, Kalyani Publisher Ludhiana
- Hotel Accounting Earnest B. Horwath & Luis Toth
- Hotel Accounting & Financial Control By Ozi A.D' Cunha & Gleson O. D' Cunha Publisher: Dicky,s Enterprize, Kandivali, Mumbai
- Hospitality Accounting – Publisher: Prentia Hall Upper Sadde, River NewJersey
- Accounting for Management, S K Bhattacharya, Vikas Publishing House
- Hospitality Financial Accounting By Jerry J Weygandt, Publisher Wiley & sons
- Accounting in Hotel & Catering Industry – Richard Kotas- International Textbook Company
- Comprehensive Accountancy, SA Siddiqui
- A complete Course in Accounting Volume – I, N.D. Kappor
- Double – Entry Book- Keeping, Rc. Chawla & C. Juneja
- Introduction to Accountancy, T.S. Grewal


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Introduction to Indian Cookery
Subject Code: HM 201 Pr

Course: BHM&CT 3rd Sem

Practical Maximum Marks : 100	Credits :2
Internal Marks	60
External Marks	40

Practical

1. Understanding Indian Cooking and Preparation of simple popular foods of India (At least one simple three course menu from each region of India , North, East, South, Seat and Central India its salient features and cooking).
2. Condiments, Herbs & Spices in Indian Kitchen – Do's & Don't's
3. Understanding Preparations of Masalas, Pastes and Gravies in Indian Kitchen Preparation of:
 - (i) Makhni Gravy
 - (ii) Green Gravy
 - (iii) White Gravy
 - (iv) Lababdar Gravy
 - (v) Kadhai Gravy
 - (vi) Achari Gravy
 - (vii) Malai Kofta Gravy
 - (viii) Yakhni Gravy
 - (ix) Yellow Gravy
 - (x) Korma Gravy

Familiarisation with, commodities and their usage in Indian Kitchens with the help of simple dishes preparations indicating their usage.


Principal
Principal,
MMICT & BM (Hotel Management),
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Food & Beverage Service
Operations**

Course: BHM&CT 3rd Sem

Subject Code: HM 203 Pr

Practical Maximum Marks : 100		Credits : 1
Internal Marks	60	
External Marks	40	

Practical

1. Restaurant Set –ups of different types & services
2. Service of Afternoon & High teas
3. Buffet Lay –up, theme Buffets set up
4. Theme Parties
5. Role Plays & Situation handling in Restaurant
6. Gueridon Service


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Accommodation & Front
Office Operations**

Course: BHM&CT 3rd Sem

Subject Code: HM 205 Pr

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

1. Identification and familiarisation with cleaning of Public Areas in Hotels.
2. Develop an understanding about requirements of different guests, with children, business travellers, single woman traveller, differently abled travellers and acquaint the learners with procedures like expression about sharing of hotel services and facilities to guests, employees as brand ambassadors of hotels, managing guest interactions effectively.
3. Handling guest Check - In, Registration, Facilitation during stay at Hotel, Billing, Related Performa's.
4. Skills to handle guest accounting and departure (FITs and groups)
5. Role play: In ref to the theory syllabus


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Principles of Baking
Subject Code: HM 209/ HM 211- X1

Course: BHM&CT 3rd Sem

Theory Maximum Marks : 100		Credits :3
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit 1** **Introduction to Bakery & Confectionary:** Role of Baker, Importance of Sanitation in Baking, Equipments, tools & ingredient used in bakery, Art of baking
- Unit 2** **Bread making:** Bread Ingredients & type of Flour used, Methods of making bread, Bread fault & remedies, Baking temperature & its importance.
- Unit 3** **Cake making:** Cake Ingredients & its functions, Methods of making Cake, Icing & its Types, Cake Decoration, Cake Balancing formula.
- Unit 4** **Chocolate:** History of Chocolate, Source of the chocolate, Types of Chocolate, Tempering of chocolate, Manufacturing & processing of Chocolate

References:

- Food Production Operations : Parvinder S Bali
- Basics of Baking : Sandeep Malik
- Basic Baking by S.C.Dubey
- Culinary institute of America : Professional Chef
- The master chef By Jean conil
- Theory of catering D Fosket,V Cesrani


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Introduction to Tourism Concepts Course: BHM&CT 3rd Sem
Subject Code: HM 209/ HM 211- X2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1 Introduction to Tourism & Tourism Products :** Definition & Meaning of Tourism & Tourist, Origin & Nature of Tourism industry, Importance/Significance of Tourism, Types & Forms of Tourism, Meaning & Components of Tourist Product, Attractions-Tourist Destinations or Places & Tourist spots, Transport systems-Air, Railways, Road & Sea.
- Unit 2 Role & Functions of Travel Agencies & Tourism Organization & Associations:** Role & Functions of a Travel Agent & Tour Operator, Importance & Role of Tourist Guides, Preparation of Itineraries, Role & function of WTO, UFTAA, PATA, ASTA, IATA etc.
- Unit 3 Travel Regulations/Formalities & Foreign Exchange:** Passports-Functions, Issuing Authority, & Procedure for obtaining the passport. Visas-Functions, Types, Issuing Authority, Procedure for obtaining visas. Foreign Exchange Regulations-Procedure for obtaining Foreign exchange, countries & currencies, customs formalities, Immigration etc.
- Unit 4 Growth & Impact of Tourism:** Positive & Negative Impact of Tourism with reference to social, economical & environmental, Role of various Agencies in the Growth of Tourism like Central & State Govt. & Private. Players.

References

- Introduction to Hospitality Industry. By Tom Powers & Clayton W. Barrows.
- Introduction to Hospitality. By John. R. Walker.
- Tourism Development-Principles & Practices by A. K. Bhatia.


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Commodities

Course: BHM&CT 3rd Sem

Subject Code: HM 209/ HM 211- X3

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **RICE, CEREALS & PULSES:-** Introduction, Classification and identification, Cooking of rice, cereals and pulses ,Varieties of rice and other cereals
- Unit 2** **Milk:** Introduction, Processing of Milk, Pasteurisation – Homogenisation, Types of Milk – Skimmed and Condensed, Nutritive Value
- Unit 3** **Cream:** Introduction, Processing of Cream, Types of Cream
- Unit 4** **Cheese:** Introduction, Processing of Cheese, Types of Cheese, Classification of Cheese, Curing of Cheese, Uses of Cheese
- Unit 5** **Fat and Oil:** Difference, Differences among saturated, mono unsaturated and poly unsaturated fatty acids, Method used to extract oils, Fats extracted from animal sources.

References:

- Theory of Cookery by Krishna Arora
- Modern Cookery (Vol. I) by Philip E. Thangam
- A Taste of India by Jaffery, Madhur
- Cookery & Introduction by Ceserani & Kinton
- Contemporary Cookery by Cesarani, kinton & Foskett


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Business Etiquettes

Course: BHM&CT 3rd Sem

Subject Code: HM 209/ HM 211- Y1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Basics of Communication** Concept, nature, role of communication in hotels Types of communication, Communication barriers, Listening –skills, types, barrier, Qualities of a good listener
- Unit 2** **Professional Grooming Standards** Relevance of professional grooming, Dress Code for hotel staff, Personal Hygiene standards, Grooming standards for hotel staff, Dos and Don'ts while working in guest areas
- Unit 3** **Types of Communication** Verbal Communication, Features of Non verbal communication, Body movements, Facial expressions, Writing skills for hotel professionals, Letter writing, Memos and Circulars, Reporting of Incidents
- Unit 4** **Standard phrases** Greeting guests, Conversation between hotel staff and guests, Standard phrases used for various guest situations, Choice of words when dealing difficult situations(drunk guest, complaint, theft, bomb threat, etc), Words and sentences used when answering the telephone, Handling guest complaints

Reference:

- Errors Mistakes & Blunders BY S.C Gupta, Arihant publications Pvt. Ltd, Meerut
- Advance English Grammar by Martin Hewings Cambridge University press
- Improve your communication skills, Barker. A kogan Page India Pvt. Ltd, New Delhi
- The Oxford Guide to writing and speaking, John Seely, Oxford University Press, New Delhi
- How to prepare for group discussion and interview, Hari Mohan Prasad and Rajnish Mohan, Tata Mac Graw Hill, New Delhi
- English Speaking, SashikumarV, &PV Dhamija, Tata Mc Graw –Hill Publishing Co.Ltd Spoken English, CIEFL, Hyderabad, in 3 volumes with 6 cassettes, OUP.
- Spoken English-RK. Bansal and J.B.Harrison, Orient Longman, 2006 Edn.
- A Practical course in English Pronunciation,(with two audio cassettes) by J.Sethi, Kamalesh sadanand & D.V.Jindal ,Prentice-Hall of India Pvt. Ltd. New Delhi
- Effective Technical Communication, M.Ashrif Rizvi, Tata Mc Graw-Hill Publishing Company
- English Language Communication: A Reader cum Lab Manual, Dr. A Ramakrishna Rao, Dr.G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
- Body Language, Allen Pease, Competition Review Pvt. Ltd., New Delhi
- Business Communication – By T.N. Chabra
- Business Communication- M.K.Sehgal & Vandana Kheterpal
- Business Communication- By Urmila Rai & S.M Rai
- A course in Listening and Speaking I, Sashikumar V, Kirr Dutt, Geetha Rajeevan, Cambridge University Press. India Pvt. Ltd. Delhi


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Hotel Safety & Security
Subject Code: HM 209/ HM 211- Y2

Course: BHM&CT 3rd Sem

Theory Maximum Marks : 100		Credits :3
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit 1** **KEY CONTROL:** Types of Keys, Computerised Key Cards, Methods of Key Control, Format of Key Control Sheet
- Unit 2** **FIRE SAFETY:** Elements of fire, Classes of Fire, Types of Fire Fighting equipments, Fire Exit Plan, Prevention of Fire, Fire Drills.
- Unit 3** **WORK PLACE HAZARDS** Concept of OSHA, Potential Work place Hazards in, Guest Areas, Preventing Accidents in Hotels, Reporting Accidents, First Aid Box, First Aid provided during trips and falls
- Unit 4** **SAFETY AT WORK PLACE:** Legal compliances-Hotel Liability Insurance, Prevention of Chemical Safety, Use of MSDS document, Safety rules when cleaning at heights, Safety tips when using equipments in guest areas, Safety tips in kitchens, Preparation of Snag Report

References

- Hotel Maintenance, N.C Goel, K.C Arora
- Hygiene and Sanitation in Hotels, S. Roday
- Hotel Housekeeping Operations and Management, G. Raghubalan, Oxford Publications
- Hotel Housekeeping Training Manual by Sudhir Andrews, Tata Mc Graw Hill
- Front Office Operations, S.C Bhatnagar


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Supervisory Management
Subject Code: HM 209/ HM 211- Y3

Course: BHM&CT 3rd Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1 INTRODUCTION TO SUPERVISION** Need for Supervisor, Nature of Work, Shift timings, Job description and specification of Floor Supervisor, Public Area, Supervisor, Front Office Supervisor, Various records maintained
- Unit 2 HUMAN RESOURCE SKILLS** Induction of department staff, Taking departmental briefing, Leadership skills, Motivation staff, Conflict handling, Handling guest complaints Maintaining co-ordination among staff and other departments, Performance Appraisal-meaning and types
- Unit 3 GUEST ROOM INSPECTION** Importance of Inspection, Rules and principles for Inspection, Inspection Checklist for guest rooms and public areas, Commonly neglected areas in guest rooms, Delegation to cleaning staff, Preparing Work Schedule
- Unit 4 TRAINING** Need of training, Benefits of training, Types of training, Training tools, techniques and equipments used, Training process

References

- Principles of Management-L M Prasad
- Hotel Housekeeping Operations and Management, G. Raghubalan, Oxford Publications
- Organization of Housekeeping Management by Dr R.K Singh
- Hotel Housekeeping Training Manual by Sudhir Andrews, Tata Mc Graw Hill
- Human Resource Management, S S Khanka


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Basics of Food Science

Course: BHM&CT 3rd Sem

Subject Code: HM 209/ HM 211- Z1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **PROPERTIES OF FOOD:** Introduction to quality attributes of foods: appearance, taste, texture , color and flavor. Taste: Definition and Factors affecting taste. Texture: Definition and texture parameters. Color: Definition and functions of color, Flavor: Definition and function of flavor intensifier.
- Unit 2** **FOOD ADDITIVES: DEFINITION AND ITS FUNCTIONS:** Preservatives, Antioxidants, Artificial sweeteners, Emulsifiers, Stabilizing agents, Artificial colors and flavors
- Unit 3** **FOOD ADULTERATION:** Food Adulteration: its definition, Incidental and accidental food adulteration, Common food adulterants and their ill effects, Food standards(in brief)
- Unit 4** **FOOD PRESERVATION:** Definition, Importance of food preservation, Food spoilage-Types and Causes, Principles & Importance of food preservation, Methods of food preservation

References:

- Food Science by N. Srilakshmi
- Food facts & principles by N. Shakuntala Manay
- Nutrition for food service & Culinary professionals by Karen Eich Drummond & Lisa M. Brefere
- Food Theory & Applications by Jane Bowers
- Food Science by: Norman Potter


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Hotel Engineering

Course: BHM&CT 3rd Sem

Subject Code: HM 209/ HM 211- Z2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Maintenance:** Role & Importance of maintenance department in the hotel industry, organizational chart, duties and responsibilities of maintenance department, preventive and breakdown maintenance, Contract maintenance, accident prevention and safety.
- Unit 2** **Fuels used in catering industry:** Types of fuel used in catering industry; calorific value; comparative study of different fuels. LPG and its properties; precautions to be taken while handling gas; low and high-pressure burners, corresponding heat output. Gas bank, location, different types of manifolds
- Unit 3** **Electricity:** Fundamentals of electricity, AC and DC; single phase and three phase and its importance on equipment specifications. Electric circuits, open circuits and close circuits, symbols of circuit elements, series and parallel connections, short circuit, fuses; MCB, earthing, reason for placing switches on live wire side. Electric wires and types of wiring. Calculation of electric energy consumption of equipment, safety precaution to be observed while using electric appliances. Safety in handling electrical equipment.
- Unit 4** **Water systems:** Water distribution system in a hotel, Cold water cistern swimming pools, Hot water supply system in hotels, Flushing system, water taps, traps and closets
- Unit 5** **Refrigeration & Air-conditioning:** Vapour compressor system of refrigeration and refrigerants, care and maintenance of refrigerators, Conditions for comfort, relative humidity, humidification ,unit of air conditioning.
- Unit 6** **Fire prevention and fire fighting system:** Classes of fire, methods of extinguishing fires, Fire extinguishers

References

- Hotel Engineering by Goyal.
- Hotel Maintenance by Goyal & Arora.


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

Subject Name: Customer Relationship Management

Course: BHM&CT 3rd Sem

Subject Code: HM 209/ HM 211- Z3

Theory Maximum Marks : 100		Credits :3
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit 1** **Customer Relationship Management:** Definitions, the Power of CRM (Scope of dimensions), CRM Success Factor. **The Customer service/sales profile** -The three level of service, the scope of customer service, CRM creating demand for hospitality & Tourism. **Choosing your CRM Strategy** CRM strategy starting point, The CRM strategy creation, Identify potential strategies
- Unit 2** i) **Managing Customer Data:** Managing customer information, Ethics & legalities of data use, Tools for computing customer information
 ii) **E-Commerce customer relationships** CRM on internet, choosing the right nechile, Rules for the success on the road to E- Commerce
- Unit 3** **Interpersonal Skills:** Managing relationship through conflict, managing the movement of conflict, Understanding Customers- Problems, Solutions, CRM in Marketing, CRM Marketing initiatives- Cross Selling & Up- selling, Customer relation, Behaviour prediction, Customer profitatrility and value modeling.
- Unit 4** **Delivering CRM:** Planning your CRM programme, managing your CRM projects, **CRM in Hotels** Front Office System – Reservations, Guest History Registrations , Guest Accounting , Departure & Payment.
 FIDELIO HOTEL MANAGEMENT SYSTEM – Reservation , Group Allotment Management , Check – in , Check – out , Guest History , Concierge.

Reference:

- Customer Relationship Management by G Shainesh .
- Relationship Marketing by Oxford Publications.
- Customer Relationship Management by Kincaid.


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

FOURTH SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Compulsory	HM 202	Personality Skills For Hospitality	-	2	60	40	100	1
	BHM206	Hospitality Marketing	4	-	40	60	100	4
	BHM208	Hospitality Laws	4	-	40	60	100	4
Elective Theory (Choose any one)	HM 204	d. Regional Cuisines of India -/ e. Food & Beverage Service Management -/ f. Accommodation Management-I	4	-	40	60	100	4
Elective Practical (As per theory)	HM 204(Pr)	d. Regional Cuisines of India -/ e. Food & Beverage Service Management -/ f. Accommodation Management-I	-	4	60	40	100	2
Elective	HM 210	Choose Any Two	3	-	40	60	100	3
	HM 212		3	-	40	60	100	3
Total			18	6			700	21

Electives						
Semester	Group X		Group Y		Group Z	
	Code	Name	Code	Name	Code	Name
IV	1	Confectionary	1	F& B Management & Control	1	Eco Tourism & Sustainable Development
	2	HACCP & Food safety	2	Professional Housekeeping	2	Financial Management
	3	Advance Cookery	3	Flower Arrangement	3	Facility Planning in Hotels

The student has to opt two subjects from group X/Y/Z(Choosing one from each). The Group choice will remain the same through out the course.


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Hospitality Marketing
Subject Code: HM 206

Course: BHM&CT 4th Sem

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1 Introduction to Marketing:** Needs, Wants and Demands; Products and Services; Markets; Marketing; The Production Concept, The Product Concept, The Selling Concept, The Marketing Concept, The Societal Marketing Concept; The Marketing Process, Service Characteristic of Hospitality and Tourism Business
- Unit 2 Marketing Environment, Consumer Markets and Consumer Buyer Behavior:** Micro and Micro Environment, Characteristics, Factors Affecting Consumer Behaviour, Buying Decision Behaviour, The Buyer Decision Process.
- Unit 3 Distribution Channels, Product Pricing and Services Strategy:** Nature and Importance of Distribution System, Marketing Intermediaries, What is Product, Product Classification, Individual Product Decisions, Product Life Cycle, Approaches to hospitality service pricing.
- Unit 4 Public Relations, Sales Promotions and Integrated Marketing Communication:** The Marketing Communications Mix, The Changing Face of Marketing Communications, Integrated Marketing Communications, Socially Responsible Marketing Communication, Advertising, Sales Promotion, Public Relations, The Public Relation Process, Personnel Selling, Direct Marketing, Technology and its applications in Marketing.

References:

- Services Marketing – Ravishankar
- Services Marketing – Zeital Valerire – A and Mary Jo Baiter Publisher: Mc Graw Hill Company
- Service Marketing - Wood ruffe Helen Publisher Macmillan
- Foundation and Practices Marketing of Services – Strategies for Success, Harsh V. Verma, Professional Manager's Library, Global Business Press
- Marketing Management, Philip Kotler, Prentice – Hall of India, New Delhi
- Hospitality & Travel Marketing, Alastair M. Morrison
- Strategic Hotel and Motel Marketing – Hart & Troy
- Marketing for Hospitality Industry – Robert
- Marketing Management in South Asian Perspective, Kotler, Philip, Kevin Keller, A. Koshy and M.Jha,- Pearson Education, New Delhi
- Marketing – Kerin, Hartley, Berkowitz and Rudeliu, TMH, New Delhi
- Marketing: Concepts and Cases – Etzel, Micael J, TMH, New Delhi
- Tourism Marketing – Manjula Chaudhary, Oxford University Press


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Multana, Ambala-133207

Subject Name: Hospitality Laws
Subject Code: HM 208

Course: BHM&CT 4th Sem

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Introduction to Indian Hospitality & Related Laws in India** Introduction, Legal Perspectives, Key Issues, The legal requirements Prior and at the time of doing Hotel Business.
- Unit 2** **Laws Related to Hotel Operations in India:** Doing Hotel Business in India, Business Contracts, Hotel Licenses and Regulations, Hotel Insurance
- Unit 3** **Laws Related to Employees, Guests, Public Health & Safety:** Introduction and Overview of Labour Laws, Hospitality Laws, Public Health and Environmental Laws
- Unit 4** **Laws Related to Food & Beverage Services:** Food Legislation and Liquor Licensing

References:

- Hotel Law by Amitabh Devendra , Oxford University Press
- Hotel & Tourism Laws by Jagmohan Negi
- Related Guidelines & Reports from Ministry of Tourism, Govt of India


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Personality Skills
for Hospitality**

Course: BHM&CT 4th Sem

Subject Code: HM 202

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

- (a) **Personality Enrichment**
Grooming, Personal hygiene, Social and Business and Dining Etiquettes, Body language, Art of good Conversation, Art of Intelligent Listening
- (b) **Etiquettes & Manners**
Social & Business Dinning Etiquettes, Social &Travel Etiquettes
- (c) **Personality Development Strategies**
Communication Skills, Presentation Skills, Public Speaking, Extempore Speaking, importance and art of 'Small Talk' before serious business
- (d) **Interpersonal Skills**
Dealing with seniors, colleagues, juniors, customers, suppliers, contract workers, owners etc at work place
- (e) **Group Discussion**
Team Behaviour, how to effectively conduct yourself during GD, do's and don'ts, clarity of thoughts and its expression
- (f) **Telephone conversation**
Thumb rules, voice modulation, tone, do's & don'ts, manners and accent
- (g) **Presentation**
Presentation skills, seminars skills role – plays
- (h) **Electronic Communication Techniques:** E mail, Fax,


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Regional Cuisine of India I
Subject Code: HM 204 a

Course: BHM&CT 4th Sem

Theory Maximum Marks : 100		Credits :4
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit 1** **Cuisines of Kashmir, Himachal & Uttarakhand:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features of Cuisine , Key Ingredients, Popular Foods, Seasonal Foods, Special Equipments, Staple Diets, Specialities during Festivals and Other Occasions, Community Foods.
- Unit 2** **Cuisines of Punjab, Haryana & Delhi:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features of Cuisine , Key Ingredients, Popular Foods, Seasonal Foods, Special Equipments, Staple Diets, Specialities during Festivals and Other Occasions, Community Foods.
- Unit 3** **Cuisines of Rajasthan & Gujarat:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features of Cuisine , Key Ingredients, Popular Foods, Seasonal Foods, Special Equipments, Staple Diets, Specialities during Festivals and Other Occasions, Community Foods.
- Unit 4** **Cuisines of Maharashtra & Goa:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features of Cuisine , Key Ingredients, Popular Foods, Seasonal Foods, Special Equipments, Staple Diets, Specialities during Festivals and Other Occasions, Community Foods.

References:

- Quantity Food Production Op. and Indian Cuisine – Parvinder S Bali, Oxford University Press
- A Taste of India By Madhur Jafferey - John Wiley & Sons
- Food of Haryana: The Great Chutneys – Dr Ashish Dahiya, University Press, MDU
- Indian Gastronomy – Manjit Gill, DK Publishers
- Food of Haryana: The Great Desserts – Dr Ashish Dahiya, University Press, MDU
- Punjabi Cuisine – Manjit Gill
- My Great India Cook Book – Vikas Khanna
- Modern Cookery (Vol –I) By Philip E. Thangam, Publishers: Orient Longman
- Practical Cookery By Kinton & Cessarani
- Hymns from the Soil: A Vegetarian Saga
- Practical Professional Cookery By Kauffman & Cracknell
- Professional Cooking by Wayne Gisslen, Publisher Le Cordon Bleu
- Theory of Catering by Kinton & Cessarani
- Theory of Cookery By K Arora, Publisher: Frank Brothers


Principal
 Principal
 NMIT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

**Subject Name: Food & Beverage Service
Management I**

Course: BHM&CT 4th Sem

Subject Code: HM 204 b

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Bar** – Introduction, Importance, and Types, Organization Structure, Layout, Equipments used and BOT & Bar Menus.
- Unit 2** **Alcoholic Beverages:** Wines – Introduction, Classification, Brief Description, about manufacturing process, storage and its service. Major Indian and International Brands. glasses and equipment, Storage and service of wine
- Unit 3** **Beers:** Introduction, Ingredients Used, Production, Types and brands, Indian and International. Services, bottled, canned and draught beers. Other Fermented & Brewed Beverages: Sake, Cider, Perry, Alcohol Free Wines.
- Unit 4** **Spirits:** Introduction to Spirits (Whisky, Brandy, Rum, Vodka, Gin & Tequila), Spirits-Types, Production, Brands Indian and International & Service, Other Alcoholic Beverages- Liqueurs & Tobacco: Types, Production, Brands & Service – Indian and International.

References:

- Food & Beverage Service – Dennis R. Lillicrap. & John A. Cousins. Publisher: ELBS
- Food & Beverage Service Management- Brian Varghese
- Food & Beverage Service Training Manual – Sudhir Andrews, Tata Mc Graw Hill.
- Food & Beverage Service Lillicrap & Cousins, ELBS
- Introduction F& B Service – Brown, Heppner & Deegan
- Menu Planning – Jaks Kivela, Hospitality Press
- Modern Restaurant Service – John Fuller, Hutchinson
- Professional Food & Beverage Service Management – Brian Varghese
- The Restaurant (From Concept to Opertion)
- The Waiter Handbook By GraHM Brown, Publisher: Global Books & Subscription Services New Delhi


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Accommodation Management I Course: BHM&CT 4th Sem
Subject Code: HM 204 c

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1 Housekeeping Supervision:** Importance of inspection, Check- list for inspection, Typical areas usually neglected where special attention is required, Self- supervision techniques for cleaning staff, Degree of discretion/ delegation to cleaning staff., staffing matrix, duty rosters, staff appraisals.
- Unit 2 Planning Trends in Housekeeping:** Planning Guest rooms, Bathrooms, Suites, Lounges, landscaping, planning for the provision of Leisure facilities for the guest, Boutique hotel concept. Planning and Organizing in the House Keeping: Area Inventory list, Frequency schedules, Performance standards, Productivity Standards, Inventory Levels, Standard Operating Procedures & Manuals, Job Allocation, Manpower Planning, Planning duty roster.
- Unit 3 Budgeting:** Budget and budgetary controls, The budget process, Planning capital budget, Planning operation budget, Operating budget – controlling expenses – income statement, Purchasing systems – methods of buying, Stock records – issuing and control
- Unit 4 Front Office Accounting and Night Auditing:** Introduction to Accounting fundamentals, Guest and non guest accounts, Accounting system, Non automated, semi automated and fully automated, Night Auditing: Introduction, Objective and job description of Night Auditor, Night Audit process, Preparing night audit reports

References:

- Accommodation & Cleaning Services, Vol. I & II, David, Allen, Hutchinson
- Hotel and Catering Studies – Ursula Jones
- Hotel Hostel and Hospital Housekeeping – Joan C Branson & Margaret Lennox (ELBS)
- Hotel House Keeping – Sudhir Andrews Publisher: Tata Mc Graw Hill.
- House Craft – Valerie Paul
- House Keeping Management by Dr. D.K. Agarwal
- House Keeping Management for Hostels, Rosemary Hurst, Heinemann
- Housekeeping and Front Office – Jones
- Housekeeping management – Margaret M. Leappa & Aleta Netschke
- Hotel Housekeeping Operations & Management – Raghubalan, Oxford University Press
- In House Management by A.K Bhatiya


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Regional Cuisine of India I
Subject Code: HM 204 a (Pr)

Course: BHM&CT 4th Sem

Practical Maximum Marks : 100		Credits :2
Internal Marks	60	
External Marks	40	

Practical:

- Two Menus about 3-5 dishes per menu per state.

Note: For focused inputs Regional Theme Lunches/ Festivals may be organised as a part of activity based learning. .


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Food & Beverage Service
Management I**

Course: BHM&CT 4th Sem

Subject Code: HM 204 b (Pr)

Practical Maximum Marks : 100		Credits :2
Internal Marks	60	
External Marks	40	

Practical

- Service of Alcoholic Beverages: Wines, Spirits.
- Opening & closing of wines corks (Champagne, Red & White wines)
- Service of Spirits & Liqueurs
- Bar setup and operations
- Cocktail Mocktail Preparation, presentation and service
- Service of Cigars & cigarettes
- Conduction Briefing/ De- Briefing for F & B outlets
- Service of Beer, Snake and Other Fermented & Brewed Beverages
- Service of Sparkling, Aromatized, Fortified, Still Wines.
- Set up a table with Prepared Menu with wines


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Accommodation Management I Course: BHM&CT 4th Sem
Subject Code: HM 204 c (Pr)

Practical Maximum Marks : 100		Credits :2
Internal Marks	60	
External Marks	40	

Practical

- Preparing Guestroom and public area checklists
- Preparing Duty Roasters, Understanding Staff Matrix.
- Planning layouts of Guest Rooms, Boutique hotels, PowerPoint's on salient features in respect to accommodation of Hotels.
- Understanding Hotel Accommodation Budgets
- Preparing for Interviews of Assistants as Supervisors and Facing Supervisors Interviews.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Confectionary

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- X1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Introduction to Confectionary:** Role of Confectionary, Equipments, tools & ingredient used in Confectionary, Storage of confectionary product
- Unit 2** **Cake Making:** Role of ingredients, Recipe balancing, Method of cake making, Faults & remedies
- Unit 3** **Cookies:** Definition / introduction, Types of cookies, Methods of mixing & baking
- Unit 4** **Icing, Frosting & Fillings:** Definition & Uses, Classification, Ingredients used
- Unit 5** **Flour Pastries:** Definition & Classification- Short Crust, Hot Water/ choux, Rough Puff, Flaky, Role of ingredients, Recipes, methods of preparation, Do's and Don'ts while preparing Pastry

References

- Basics of Baking: Sandeep Malik
- Basic Baking by S.C.Dubey
- Culinary institute of America : Professional Chef
- The master chef By Jean conil
- Theory of catering D Fosket,V Cesran


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: HACCP & Food Safety

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- X2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

Unit 1 Introduction to food safety :Definition of food safety, food safety measures, Factors affecting food safety, importance of safe foods. Food contaminants of natural origin-toxicants of animal foods, plant foods. Environmental contaminants: biological contaminants, pesticide residues, heavy metals

Unit 2 Sanitation and Hygiene: Sanitation and hygiene in food service establishments, Cleaning agents, disinfectants, sanitizers, Waste disposal , Pest and rodent control.

Unit 3 Food Standards: ISO Certification, PFA, CPA, FPO

Unit 4 HACCP: Relevance of Microbiological standards for food safety, HACCP (Basic Principle), its status in India.

References

- Modern Food Microbiology by Jay. J.
- Food Microbiology by Frazier and Westhoff
- Food Safety by Bhat & Rao
- Safe Food Handling by Jacob M.
- Food Processing by Hobbs Betty


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Advance Cookery

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- X3

Theory Maximum Marks : 100		Credits :3
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit 1** **VEGETABLE AND FRUIT COOKERY:** Introduction – classification of vegetables, Pigments and colour changes, Effects of heat on vegetables, Cuts of vegetables, Classification of fruits, Uses of fruit in cookery, Salads and salad dressings
- Unit 2** **Foundation of Indian cuisine:** Condiments, herbs & spices, composition & Varieties of different masalas used Regional Areas, basic gravies.
- Unit 3** **Herbs and Spice:** Herbs, Spice, Uses of herbs and spice
- Unit 4** **Salad and Dressing:** Define, Types, Compound salad and parts
- Unit 5** **Accompaniment and Garnishes** Define, Food and their usual accompaniment, Suggested garnishes
- Unit 6** **SANDWICHES AND CANAPÉS:** Introduction, Parts of Sandwiches, Types of Breads & Fillings, Types of sandwiches and canapés, Preparation of sandwiches and canapés, Different ingredients used for canapés.

References

- Theory of Cookery by Krishna Arora
- Modern Cookery (Vol. I) by Philip E. Thangam
- A Taste of India by Jaffery, Madhur
- Cookery & Introduction by Ceserani & Kinton
- Contemporary Cookery by Cesarani, kinton & Foskett


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Food & Beverage
Management & Controls**

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- Y1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **INTRODUCTION TO CONTROL:** Cost Control – Objectives & Advantages, Methodology & phases of control, Food Cost Control – Objectives, Control Procedures – Daily & Monthly food Cost calculations, Beverage Control – Purchasing, Receiving, storing & Issuing, Production Control , Bar Frauds & Books maintained.
- Unit 2** **PURCHASING:** Objectives & Source of Supply, Purchasing staff, Selection of Supplier, Types of Food Purchase, Definition & advantages of S.P.S, Purchase procedure & Different Methods of Purchasing
- Unit 3** **RECEIVING:** Objectives & Receiving Procedures, Receiving staff, Daily Receiving Register, Equipments Required for Receiving , Bills/Invoices/cash Memo/Credit Notes, Delivery Note. Records maintained in Receiving department, Blind receiving, Frauds in Receiving
- Unit 4** **STORING & ISSUING:** Storing & Issuing Procedures, Storing & Issuing Control, Facilities & Equipment, Location of Store Rooms & Arrangement for Food Storage, Security & stock Control, Requisition & Transfer Note, Types of Stores Received , Records Maintained & stock taking.

References:

- Food Service Management by Manish Ratti
- Food Service & Catering Management by R.K Malhotra
- Effective Food Service Management by Y.P Singh
- Food & Beverage Management by Cousins Foskett Shortt
- Purchasing – Selection & Procurement for Hospitality Industry by Andrew Hale Feinstein & John M.Stefanelli
- Food & Beverage cost control by Jack. E. Miller, Lea R. Dopson, David K. Hayes


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Professional Housekeeping

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- Y2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Changing Role Of Executive Housekeepers:** Increasing Dimension of Housekeeping in Hospitals, Airlines, Cruise Lines, Hiring of staff- Hiring process, Job description and job specification, Role of Executive Housekeeper in achieving guest satisfaction, Cost control techniques in hotels, Changing Leadership and Management styles
- Unit 2** **Green Housekeeping:** Eco-friendly products and amenities used in hotels, Sustainable cleaning practices in hotels, Energy and water conservation practices in hotels, Waste management practices in hotels and hospitals, Recycling housekeeping supplies
- Unit 3** **Ergonomics In Housekeeping:** Potential hazards at workplace, Minimizing risk factors, Application of ergonomic principles in modifying workplace design, layout and cleaning routine practices, OSHA standards, Understanding concept and use of MSDS, Proper housekeeping postures, Accident prevention.
- Unit 4** **Housekeeping Trends:** I.T intervention, Outsourced housekeeping operations in hotels, Latest guest room supplies and linen provided in guest rooms, Job sharing, cross training/alternative scheduling, Employee counseling, Flower Arrangement- nature, importance, types, equipments and accessories required, rules for preparation, styles, Ikebana

References:

- Hotel, Hostel & Hospital Housekeeping by Branson, Lennox
- Organisation of Housekeeping Management by Dr R.K Singh
- Professional Housekeeping by Jones
- Housekeeping Management by Amrik Singh Sudan
- Housekeeping Training Manual by Sudhir Andrews


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

**Subject Name: Eco Tourism & Sustainable
Development**

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- Z1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Introduction to Eco Tourism** : Definition, Concept , Growth & Principles Emerging Concepts: Eco / rural / agri/ farm/ green/ wilderness/ country side/ special interest tourism.
- Unit 2** **Tourism** : Environmental Relevance ,Eco – tourism in 3rd World Countries – Problems , and proposed solutions, key steps to maintain tourism Eco- Friendly. Protected areas and ecotourism.
- Unit 3** Concept of carrying capacity, Sustainable development. Eco – tourism and community development. Geographic Information System (GIS). Environmental Protection Act (EPA) of India
- Unit 4** Eco – tourism as a world wide phenomena Concept and planning of eco – tourism destinations. Developing and implanting Eco tourism guidelines for wild lands and neighboring communities. Environment Impact Assessment (EIA),
- Unit 5** International considerations, International Organisation dealing with preservation and conservation. Conference, convention & declaration related to environments
- Johannesburg
 - Rio – declaration (Agenda 21)
 - Quebec declaration
 - Environmental Code of conduct

References:

- Basics of Tourism-K.K Kamra& Mohinder Chand
- Travel Agency management-Dr. Mohinder Chand
- Tourism Operations & Management- Sunetra Roday, Oxford Publications


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Financial Management

Course: BHM&CT 4th Sem

Subject Code: HM 210/ HM 212- Z2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Financial management: Meaning & scope:** Meaning of business finance, Meaning of financial management, Objectives of financial management
- Unit 2** **Ratio analysis:** Meaning of ratio, Classification of ratios (Only Formulas), Importance of ratio Analysis, Objectives of Ratio Analysis
- Unit 3** **Funds flow analysis & cash flow analysis:** Meaning of funds flow statement & cash flow statement, Uses of funds flow statement & cash flow statement, Difference between cash flow and funds flow analysis
- Unit 4** **Financial planning & working capital:** Meaning of Financial Planning, And working capital, Importance and objectives of Financial Planning, Factors determining working capital needs

References:

- Damodaran, A., Corporate Finance, J Wiley
- Pandey, I.M., Financial Management, Vikas Publishing House
- Chandra, P., Financial Management, Tata McGraw-Hill
- Brealey, R., & Myers, S.C., Principles of Corporate Finance, Tata McGraw -Hill
- Van Home, J.C., Financial Management And Policy, Pearson Education


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Facility Planning in Hotels
Subject Code: HM 210/ HM 212- Z3

Course: BHM&CT 4th Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Hotel Design:** Design Considerations, Systematic Layout Planning, Feasibility Study, Flow process & flow diagram, Blueprints
- Unit 2** **Hotel Classification, Guidelines and Requirement for Approval:** Guidelines for approval of hotel projects. Criteria for star classification of hotels in India. Related Bylaws, Rules and Regulations, Licences and Permits required for all facility planning.
- Unit 3** **Restaurant and Kitchen Design:** Types of Restaurant, Area required & theme. Designing and Planning a Restaurant. Layout of Commercial Kitchen. Planning of various support services.
- Unit 4** **Guestroom, Bathroom, Public Area:** Planning and Design, Planning norms and considerations, Planning and designing guestrooms and bathrooms Area allocation and standard dimensions for Public Areas

References:

- Systematic layout planning- Richard Muther Cahners Books, Division of Sahnors publishing company, Inc. 89 Franklin Street, Boston U.S.A
- Food service Planning: Layout & Equipment: Lendal H Kotschevar, Margaut E Terrell
- Management operations & Research: N Satyanarayan Lalitha Raman- himalya Publishing House.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

FIFTH SEMESTER								
	Course Code	Course Title	Evaluation Criteria	Contact Hours	Weight age		Total Marks	Credit
				Pr.	Internal	External		
Compulsory	BHM 301	Practice School (Industrial Exposure)	Training Log Book/ Training Report	22 Weeks	100	-	100	22
	BHM 303		Presentation		100	-	100	
	HM 305		Viva - Voce		-	100	100	
			Total	22 weeks			300	22


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

SIXTH SEMESTER

	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
Compulsory	HM 302	Skill Enhancement for Media & Journalism in Hospitality	-	2	60	40	100	1
	HM 306	Project Report	-	10	-	100	100	5
	HM 308	Researching for Hospitality & Tourism Management	3	-	40	60	100	3
Elective Theory (Choose any one)	HM 304	d. Regional Cuisines of India -II/ e. Food & Beverage Service Management - II/ f. Accommodation Management-II	4	-	40	60	100	4
Elective Practical (As per theory)	HM 304 Pr	d. Regional Cuisines of India -II/ e. Food & Beverage Service Management - II/ f. Accommodation Management-II	-	4	60	40	100	2
Elective	HM 310	Choose Any Two	3	-	40	60	100	3
	HM 312		3	-	40	60	100	3
		Total	13	16			700	21

Electives						
Semester	Group X		Group Y			Group Z
	Code	Name	Code	Name	Code	Name
VI	1	Chocolate, Icing & sugar	1	Hotel Interior Decoration	1	Retail Management
	2	Kitchen Management	2	Room Division	2	Strategic Management
	3	Larder	3	Hotel Economics	3	Entrepreneurship Development

The student has to opt two subjects from group X/Y/Z (Choosing one from each). The Group choice will remain the same through out the course.


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

**Subject Name: Researching for Hospitality
Journalism in & Tourism**

Course: BHM&CT 6th Sem

Subject Code: HM 308

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit-1** **Introduction to research methodology:** Meaning, definition, characteristics and types of research, Methodology of research, formulation of research problem Research Design: Meaning, characteristics of research design, steps in research design. Concept of Hypothesis
- Unit-2** **Sampling Design and Data Collection:** Meaning of sampling, aims in selection a sample, Types of sample design. Data collection –Meaning, types of data, methods of collecting primary data-observation, interview and questionnaire, Sources of secondary data.
- Unit-3** **Processing and Analysis of data:** Editing, Coding, Classification and tabulation, Graphical presentation of Data-Bar-chart, pie-chart and curves Interpretation of Data meaning, methods of data analysis
- Unit-4** **Report Writing:** Meaning, types and steps involved in writing report, layout of the research report, mechanics of writing a research report, challenges of a good writing

References

- **Kumar Ranjit: Research Methodology: A Step by Step Guide for Beginners**, Sage Publication, 2014.
- Kothari C.R. : Research Methodology, New Age International, 2011.
- Shajahan S. : Research Methods for Management, 2004.
- Mustafa A. : Research Methodology, 2010.
- Thanulingom N : Research Methodology, Himalaya Publishing
- C. Rajendar Kumar : Research Methodology , APH Publishing
- Gupta Hitesh and Gupta S. L. : Research Methodology, International Book House, 2011.
- J. R. Brent Ritchie, Charles R. Goeldner : Travel, Tourism, and Hospitality Research: A Handbook for Managers and Researchers, Wiley Publishers
- Peter Mason: Researching Tourism, Leisure and Hospitality for your Dissertation; Good Fellow Publishers Ltd, UK


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Enhancement for Media & Journalism in Hospitality & Tourism **Course: BHM&CT 6th Sem**

Subject Code: HM 302

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Course Contents:

- Unit 1 :** **Journalism, Hospitality & Tourism:** Introduction to Journalism, Definition of a Journalist, Nature & Scope of Journalism, Journalism - Hospitality & Tourism: Careers & Opportunities, Familiarisation with tasks and profile of a Journalist, Ethics for Journalists, Current Issues for Journalists, Travel, Tourism & Hospitality Writing, Types of Travel Writing.
- Unit 2:** **Pioneers in Hospitality & Tourism Journalism & Media: Pioneers in Travel Writing,** Great travel stories of Marco Polo, Hiuen Tsang, Iban Batuta, Al Baruni, V.S. Naipaul, Rahul Sankratayan, William Dalrympal, Today's Hospitality Pioneers – Chef Manjit Gill, Studio Food Promoters - Chef Sanjeev Kapoor, Chef Vikas Khanna, David Rocco
- Unit 3:** **Creative Travel, Tourism & Hospitality Writing:** : Introduction to creative writing, information collection, writing for hospitality, tourism and travel magazines, Writing for online magazines, Studies from Hospitality Biz India, Travel Biz Monitor and Express Hospitality Magazines, Travel web searching (browsing).
- Unit 4:** **Media Applications for Hospitality:** Introduction Media, Its Role in Hospitality Promotion, Televisions, Food Food Channel, TLC Channel, Food & Travel Shows, Social Media-Creating Pages and Profiles, Merits/Demerits of Social Media. Developing promotional Literature, Travel & Hospitality Photography, New Trends

Reference:

- Magazines of Airlines, Hotels & Tourism Organisations.
- Hand Book of Journalism & Mass Communications by V.S. Gupta, Vir Bala Aggarwal, concept Publishers, New Delhi.
- Hospitality Biz India, Travel Biz Monitor
- Hotel Promotional Literatures
- Mass Communication Theory & Practice by Uma Narula, Hiranand Publication, New Delhi.
- Mass Communication, Wilbur Schram
- Outlook Traveler
- The Art of Travel : Essays on Travel Writing, Dodel, Philip
- Travel in the ancient world, Cason, Leonell, George Allen
- Understanding Media by Marshal McLuhan.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Project Report
Subject Code: HM 306

Course: BHM&CT 6th Sem

Practical Maximum Marks : 100	Credits :5
Internal Marks	-
External Marks	100

Course Contents:

Keeping in view the diverse nature of tourism & hospitality industry & its long- term implications on the economy, society, culture & environment, It is mandatory to do some project work so as to sharpen the research skills, develop a practical understanding of the Hospitality system, attain some field experience etc. Students are required to prepare a project on a topic of their choice approved from Faculty from Institute/ Head of Department (F.O/ F&Bs/ F.P/ A.Op) Computer Typed {Times New Roman} compiled & Hard bound copy (Two print Copies) and One soft copy in C.D.

The Project should include:-

- **The First page** should include Name of The Institute / University, Project undertaken, Roll Number & Name.
- **Certificate by Candidate of genuine work.**
- **Acknowledgement.**
- **Certificate of approval.**
- **Introduction to the topic.**
- **Problem Definition**
 - Need of study
 - Problem Definition
 - Research objective
 - List of Information
- **Research Methodology**
 - Research design
 - Source of data
 - Instrumentation of data collection
 - Sampling Design
- **Analysis, Findings & Interpretation.**
- **Suggestions & Recommendations.**
- **Conclusion or Silent Findings**
- **Limitation**
- **Bibliography**
- **Annexure**

Selecting A Topic:-

Selecting a topic is the first issue. About the only thing you will be sure of should be that do you want to write on a subject that directly relates to Hotels or is associated with tourism. A lot of thinking & creativity is required at planning stage.

The purpose of project for you is to-

- Learn about various hospitality issues.
- Learn how to evaluate the potential.
- Improve organizing & managerial skills.

Sample themes of Research are:-

Accommodation Management-

- "Technology in Hotel Accommodation Services:- A case study of Hotel- ABC."

Various topics can be selected suggested themes are-

- Surveying of Guest Behavior
- Surveying of Environment Conservation
- Surveying of Negative impacts of System
- Segmentation of Guest staying in unit.
- Profiling of Tourists/ Guests
- Comparative analysis of Tariff Strategies.

- Linkages amongst various constituents of Hospitality industry
- HRD- Policies of Unit/ Chain
- Cost Control in Housekeeping/ Kitchen
- Safety & Security Issues- Case studies

The above mentioned are simply few suggested topics. The candidates are free to select a topic of their choice with due consultation with the faculty member


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Regional Cuisine of India II
Subject Code: HM 304 a

Course: BHM&CT 6th Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit – 1 Cuisines of Andhra Pradesh, Tamil Nadu & Kerala:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features of Cuisine , Key Ingredients, Popular Foods, Seasonal Foods, Special Equipments, Staple Diets, Specialties during Festivals and Other Occasions, Community Foods.
- Unit – 2 Cuisines of Awadh, Bengal & Odisha:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features of Cuisine , Key Ingredients, Popular Foods, Seasonal Foods, Special Equipments, Staple Diets, Specialities during Festivals and Other Occasions, Community Foods.
- Unit – 3 Indian Sweets & Desserts:** Introduction, Geographical Perspectives, Brief Historical Background, Characteristics & Salient Features , Key Ingredients, Popular Sweets, Seasonal Sweets, Special Equipments, Specialties during Festivals and Other Occasions.
- Unit – 4 Food of India:** Jain Food, Parsi Food, Home Style Cooking, Tandoori Foods, Dum Style of Cooking, Traditional Cooking Delights, North Eastern Indian Foods, Food of Madhya Pradesh

References:

- Quantity Food Production Op. and Indian Cuisine – Parvinder S Bali, Oxford University Press
- A Taste of India By Madhur Jafferey - John Wiley & Sons
- Indian Gastronomy – Manjit Gill, DK Publishers
- Food of Haryana: The Great Desserts – Dr Ashish Dahiya, University Press, MDU
- The Essential Kerala Cookbook Paperback by Vijayan Kannampill
- My Great India Cook Book – Vikas Khanna
- Modern Cookery (Vol –I) By Philip E. Thangam, Publishers: Orient Longman
- Practical Cookery By Kinton & Cessarani
- Flavours of the Spice Coast – K M Mathew
- Practical Professional Cookery By Kauffman & Cracknell
- Professional Cooking by Wayne Gisslen, Publisher Le Cordon Bleu
- Theory of Catering by Kinton & Cessarani
- Theory of Cookery By K Arora, Publisher: Frank Brothers


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

**Subject Name: Food & Beverage
Service Management II**

Course: BHM&CT 6th Sem

Subject Code: HM 304 b

Theory Maximum Marks : 100		Credits :3
Internal Marks	40	
External Marks	60	

Course Contents:

- Unit – 1** **Wines -I** Definition, Classification with examples, - Table/Still/Natural, Sparkling, Fortified, Aromatized, Production of each classification, Principal wine regions and wines of France, Germany, Italy, Spain,
- Unit – 2** **Wines –II** Principal wine regions and wines of Portugal, USA, Australia; New World Wines (brand names) India, Chile, South Africa, Algeria, New Zealand, Food & Wine Harmony, Storage of wines, Wine terminology (English & French)
- Unit – 3** **The Beverage Industry:** Introduction, Yesterday & Today, Responsible Alcohol Service, Creating and Maintaining a Bar Business, Sanitation and Bar Setup, Legal Aspects, Professional Services.
- Unit – 4** **Bar Management:** Introduction, Purchasing, Storing, Receiving, Issuing; Controlling, marketing Beverage Products Responsibly, Employee Management, Art of Mixology, Planning for Profits, Bar Menus

References

- Financial & Cost control techniques in hotel & Catering Industry – Dr J.M.S. Negi
- Food & Beverage Control By: Richard Kotas and Bernard Davis
- Food & Beverage Cost Control- Lea R Dopson, Wiley Publishers.
- Food & Beverage Management By: Bernard Davis & Stone
- Food & Beverage Service- Dennis R. Lillicrap. & John.A. Cousins. Publisher: ELBS
- Food & Beverage Service Management- Brian Vargese
- Food & Beverage Service Training Manual- Sudhir Andrews, Tata Mc Graw Hill.
- Hotel & Catering Costing & Budgets, RD. Boardman, Heinemann
- Introduction F & B Service- Brown, Heppner & Deegan
- The Bar and Beverage Book, 5th Edition - Costas Katsigris, Chris Thomas, Wiley Publications
- Principles and Practices of Bar and Beverage Management – James Murphy; Goodfellow Publishers
- ManageFirst: Bar and Beverage Management – National Restaurant Association


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Accommodation Management II
Subject Code: HM 304 c

Course: BHM&CT 6th Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit- 1 Interior Decoration:** Importance, Definition & Types, Classification, Principles of Design: Harmony, Rhythm, Balance, Proportion, Emphasis, Elements of Design: Line, Form, Colors, Texture, Flower Arrangement: Concept & Importance, Types & Shapes and Principles, Equipment and material required for flower arrangement, Conditioning of plant material, Indoor Plants care and role of housekeeping.
- Unit – 2 Colors:** Color Wheel, Importance & Characteristics, Classification of colors, Color Schemes. Lighting: Classification, Types & Importance, Applications. Furniture Arrangements: Principles, Types of Joints, Selection.
- Unit – 3 Floor & Wall Covering:** Types and Characteristics, Carpets: Selection, types, Characteristics, Care and Maintenance. Windows, Curtains, and Blinds Soft Furnishings and Accessories: Types, use and care of Soft furnishing, Types of Accessories: Functional and Decorative,
- Unit – 4 Computer Applications in Hotel Accommodation:** Introduction to Hotel Software's, Operating Procedures, Salient Features Merits & Challenges, Handling Guest and non guest accounts, Preparing reports, Giving Maintenances,; **Planning & Evaluating Front Office Operations:** Forecasting techniques, Forecasting Room availability, Useful forecasting data, (• % of walking, • % of overstay, • % of under stay) Forecast formula, Sample forecast forms; **Yield Management** - Concept and importance, Applicability to rooms division (Capacity management, Discount allocation, Duration control, Measurement yield, Potential high and low demand tactics, Yield management software, Yield management team

References:

- Hotel Hostel and Hospital Housekeeping – Joan C Branson & Margaret Lennox (ELBS)
- Hotel House Keeping – Sudhir Andrews Publisher: Tata Mc Graw Hill.
- House Craft – Valerie Paul
- House Keeping Management for Hostels, Rosemary Hurst, Heinemann
- Housekeeping and Front Office – Jones
- Housekeeping management – Margaret M. Leappa & Aleta Netschke
- Hotel Housekeeping Operations & Management – Raghubalan, Oxford University Press
- In House Management by A.K Bhatiya
- Front office operations by colin Dix & Chirs Baird
- Management front office operations by Kasavana & Books


Principal
 NMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Regional Cuisine of India II
Subject Code: HM 304 a (Pr)

Course: BHM&CT 6th Sem

Practical Maximum Marks : 100		Credits :2
Internal Marks	60	
External Marks	40	

Practical:

- Two Menus about 3-5 dishes per menu per state covering all units.

Note: For focused inputs Regional Theme Lunches/ Festivals may be organised as a part of activity based learning.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Food & Beverage
Service Management II**
Subject Code: HM 304 b (Pr)

Course: BHM&CT 6th Sem

Practical Maximum Marks : 100	Credits :2
Internal Marks	60
External Marks	40

Practical

1. Bar Setups of different types & services
2. Service of Wines & Bar Menus
3. Reading Wine Labels,
4. Cocktail parties
5. Role Plays & Situation handling in Bar


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Accommodation Management II Course: BHM&CT 6th Sem
Subject Code: HM 304 c (Pr)

Practical Maximum Marks : 100		Credits :2
Internal Marks	60	
External Marks	40	

Practical:

- Hands on practice of computer application (Hotel Management System) related to Rooms Division procedures as covered in syllabus
- Presentations on Interior Decorations
- Flower Arrangements Workshops
- Visit to Local Resources


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Chocolate Icing & Sugar
Subject Code: HM 310/ HM 312- X 1

Course: BHM&CT 6th Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Chocolate:** History of Chocolate, Source of the chocolate, Types of Chocolate, Tempering of chocolate, Manufacturing & processing of Chocolate
- Unit 2** **Cocoa :** Food value, Storage, Uses
- Unit 3** **Frozen dessert:** Types & definition , Sorbet, ice cream & other dessert, Handling & storage, Custard, pudding, mousse & soufflé
- Unit 4** **Sugar :** Various types of commercial Sugar, Cooking of Sugar, Stages of Sugar with Temperature
- Unit 5** **Icing, Frosting & Fillings** Definition & Uses, Classification, Ingredients used

Reference:

- Basics of Baking : Sandeep Malik
- Basic Baking by S.C.Dubey
- Culinary institute of America : Professional Chef
- The master chef By Jean conil
- Theory of catering D Fosket,V Cesran


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Kitchen Management

Course: BHM&CT 6th Sem

Subject Code: HM 310/ HM 312- X 2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **Layout and Planning of Kitchen:** Concept of kitchen layout, Layout of different kitchen, Production planning of different kitchen, Work flow, Organizational Hierarchy, Work flows in the kitchen stewarding, Space allocation, Layout of stores
- Unit 2** **Costing:** Concept of costing, Types of cost- Total cost, Direct cost, Indirect cost, Over heads, Operation cost, Material cost, Labor cost, Overhead net profit, Gross profit, Cost of staff meal, Preparation of Cost sheet or statement of food cost, Food costing, Food cost percentage, Desired over all food cost percentage, Preliminary selling price, Actual selling price, Dish costing, Standard Portion Size
- Unit 3** **Management functions:** Duties and Responsibilities of Executive Chef, Recruitment and selection of kitchen staff, Inventory management, Waste Management, Color Coding of kitchen chopping boards, dustbins, HACCP as a control tool, importance, definition & usage of HACCP.
- Unit 4** **Purchase:** Purchase Considerations, Preparation of SPS and Purchase Order, Receiving procedure of red & white meats, Pricing of various meat cuts, Joints, raw meat, price ratio, Determining cooked meat price, Pre-portioned meat.
- Unit 5** **Budgeting:** Budget as a control measure, Essentials of budgeting, Objects and advantages of budgetary control, Type of budgets, Preparation of a budget.

References:

- Theory of Cookery by Krishna Arora
- Modern Cookery (Vol. I) by Philip E. Thangam
- Larousee Gastronomique by Paul Hamlyn
- The Book of Ingredients by Jane Grigson
- The professional Chef by Le Rol A. Polsom
- Professional Cooking by Wayne Gisslen
- The complete guide to the art of modern cookery by Escoffier
- Professional cooking by Wayne Glasslen
- A Taste of India by Jaffery, Madhur
- Cookery & Introduction by Ceserani & Kinton
- Contemporary Cookery by Cesarani, kinton & Foskett
- Classical Food preparation & presentation by Wkh Bode
- Classical recipes of the world by Smith, hanery


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Larder

Course: BHM&CT 6th Sem

Subject Code: HM 310/ HM 312- X 3

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Contents:

- Unit 1** **EGG COOKERY** composition and structure, Quality point for fresh eggs, Spoilage of eggs, Uses of egg in cookery, Use and properties of eggs
- Unit 2** **OFFALS** Introduction, Quality. Food Value, Storage, Cooking Method.
- Unit 3** **GAME:** Classification of game, The supply of game, Quality purchasing point for young game, Use of game
- Unit 4** **Poultry Cookery:** Classification of Poultry, Choosing and buying for value Thawing frozen poultry, (Chicken, Goose, Turkey)
- Unit 5** **Force meat:** Introduction, Types, Procedure of galantine, Salami, Sausages
- Unit 6** **MEAT** How to judge the quality of various meats, Purchasing, Cooking method of various meats, Ham and Bacon

References:

- Theory of Cookery by Krishna Arora
- Modern Cookery (Vol. I) by Philip E. Thangam
- A Taste of India by Jaffery, Madhur
- Cookery & Introduction by Ceserani & Kinton
- Contemporary Cookery by Cesarani, kinton & Foskett


Principal
Principal,
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Multana, Ambala-133207

Subject Name: Hotel Interior Decoration

Course: BHM&CT 6th Sem

Subject Code: HM 310/ HM 312- Y 1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Content:

- Unit 1 Introduction To Interior Design** Elements of Art and Design, Principles of Art and Design, Components of Interior Design in Hotels, Components of Interior Decoration in Hotels, Difference between Interior Decoration and Interior Design
- Unit 2 Interior Designing Of Guest Areas:** Colour- meaning, types, Prang's Colour wheel, Planning Colour Schemes for guest areas, Importance of planning colour schemes, Sample colour schemes for guest areas, Light-meaning, unit of measurement, Types and modes of lighting, Requirement of light in different areas
- Unit 3 Guest Room Flooring & Furnishing:** Types of Curtains & Blinds, Valence and Swag, Need for flooring, Selection of flooring, Types of floor- characteristics, use and care, Carpets- parts of carpet, popular types, laying ,selection criteria, cleaning
- Unit 4 Interior Decoration In Public Areas** Public Areas in Hotels, Types of furniture used in public areas, Types of fabrics uses in public areas, Upholstery types, Theme set up for special occasions, Planning different themes for various occasions

References:

- Hotel, Hostel & Hospital Housekeeping by Branson, Lennox
- Organisation of Housekeeping Management by Dr R.K Singh
- Professional Housekeeping by Jones
- Housekeeping Management by Amrik Singh Sudan
- Housekeeping Training Manual by Sudhir Andrews


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Room Division
Subject Code: HM 310/ HM 312- Y 2

Course: BHM&CT 6th Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Content:

- Unit 1 Organization Of The Rooms Division Section Of Hotel:** Need for Rooms Division Section in a hotel, Organization structure of Front Office and Housekeeping Staff rendering guest services, Role and responsibilities of Rooms Division Manager, Manager on Duty, Lobby Manager, Front Office Manager, Executive Housekeeper, Guest Relations Executive, Job of Concierge, Valet Service in guest satisfaction
- Unit 2 Front Office Operations Management:** Guest Cycle, Rooming a guest, Records and formats maintained at Front Desk, Paging and providing information to a guest, Guest History Management
- Unit 3 Guest Room Operations:** Types and placement of amenities for different categories of guests, Guest Loan items, Rules while working on guest floors, Procedures to handle guest room keys, mails and messages, Records and formats maintained at Housekeeping Control Desk, Establishing standards, monitoring performance, corrective action in the department., Concept of Yield Management
- Unit 4 Managing Communication And Human Resource In Rooms Division Department:** Need for co-ordination between Housekeeping Control Desk and Front Desk in Hotels, Procedure for handling different categories of guests in hotels, Telephone Etiquettes applicable in hotels, Factors to consider while hiring guest service area staff(Attributes, Job breakdown) Management and HR responsibilities concerning training, orientation, motivation and performance assessment of staff, Job sharing, cross training/alternative scheduling, Employee counseling, Management Reports generated by Rooms Division Manager

References:

- Hotel, Hostel & Hospital Housekeeping by Branson, Lennox
- Organisation of Housekeeping Management by Dr R.K Singh
- Professional Housekeeping by Jones
- Housekeeping Management by Amrik Singh Sudan
- Housekeeping Training Manual by Sudhir Andrews
- Hotel Front Office Management – S.K. Bhatnagar
- Effective Front Office Operations – M.Kesavan
- Hotel Reception – Arnold Heinman
- Basic Hotel Front Office – Peter Franny Renner
- Hotel front office management – James a Bardi
- Hotel front office management – Kasavana and Broops
- Front office training manual – Sudhir Andrews


Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Hotel Economics

Course: BHM&CT 6th Sem

Subject Code: HM 310/ HM 312- Y 3

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Content:

- Unit 1 Basic Terms used in Economics**
- Micro & Macro Economics
 - Problem of Scarcity – Lionel Robbins Definition of Economics
 - Economic Tasks – Production & Distribution
 - Economic Entities – Household & Firm
 - Distinction between Plant, Firm & Industry.
- Unit 2 Demand Analysis**
- Meaning, Types & Determinants of Demand
 - Meaning & Determinants of Individual & Market Demand
 - Demand Function & Demand Schedule
 - The Law of Demand
- Unit 3 Theory of Consumer Demand**
- Utility - Meaning & Types
 - The Law of Diminishing Marginal Utility
 - The Law of Equi-Marginal Utility
- Unit 4 Elasticity of Demand**
- Concepts, Kinds & Types
 - Measurement of Price Elasticity Demand
- Unit 5 Production Analysis**
- Concepts & Attributes
 - The Law of Variable Proportions
 - The Law of Returns to Scale
- Unit 6 Supply Analysis**
- Meaning & Determinants of Supply
 - The Law of Supply
 - Elasticity of Supply- meaning, measurement & factors affecting elasticity of Supply

References

- Economics for Hotel & Catering Students – By Howard & Huggle
- Introduction to Economics – Caiseneross
- Managerial Economics - Jean


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Retail Management

Course: BHM&CT 6th Sem

Subject Code: HM 310/ HM 312- Z 1

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Content:

- Unit- 1 The Business of Retail:** Retailing- Definition, Concept Importance, Functions of a retailer, Relationship between retail and Marketing, Retail as a career. Retail in India- Evolution, changes in the retail sector, The Wheel of Retailing, The Accordion, The Retail Life Cycle, Emerging Trends in Retailing, Retail Scenario in India, Retail Competition, Retail Formats.
- Unit-2 Retail Models** and Theories of Retail Development- Theories of retail development, concept of life cycle in retails, Business models in retails, Airport Retailing, Services retailing. Information Gathering in Retailing, Retail Strategic Planning and Operation Management, Retail Financial Strategy, Target Market Selection and Retail Location, Store Design and Layout, Visual Merchandising and Displays.
- Unit-3 Merchandise** Planning, Buying and Handling, Merchandise Pricing, Retail Communication Mix, Promotional Strategy, Retail Human Resources Management, Customer Service, The GAPs Model, Customer Relationship Management.
- Unit-4 Retail Operating Skills:** Pre-Check, Opening the Sale, Probing, Demonstration, Trial, Close Handling Objections, Closing, Confirmations & Invitations. Retail Management Information Systems, Retail Audits, Online Retailing, Global Retailing, Legal and Ethical Issues in Retailing.

Note: A visit to retail mart may be organised to supplement learning of students.

References:

- Levy IM. And Weitz B.A (2004), Retailing Management, 5th ed., Tata McGraw Hill.
- Berman B. Evans J. R. (2004), Retail Management, 9th Edition, Pearson Education.
- Bajaj C; Tuli R., Srivanstava N.V. (2005), Retail Management, Oxford University Press, Delhi.
- Dunne P.M, Lusch R.F. and David A. (2002), Retailing, 4th ed., South-Western, Thomson Learning Inc.
- Pradhan, Swapna; Retailing Management; Tata McGraw Hill; New Delhi


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Strategic Management

Course: BHM&CT 6th Sem

Subject Code: HM 310/ HM 312- Z 2

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Content:

- Unit 1 Strategic Management** Introduction to strategic management, Overview of strategic management process, Strategic Decision Making Process, Need to define Strategic Intent through Vision, Mission, Objectives Study of Strategic Intent of Various Hotels
- Unit 2 Hotel Environment** Study of Hotel Environment, Forces influencing hotel internal and external environment, Components of Internal Environment, Components of External Environment, Environmental Scanning Techniques: SWOT analysis, Opportunity-Threat Profile, Porter's framework, Internal Appraisal- concept, Techniques of Internal Appraisal-Value Chain Analysis, Benchmarking, Key Factor Rating, Identification of Critical Success factors
- Unit 3 Strategy Formulation and Choice:** Corporate Level Strategy- Stability, Expansion, Retrenchment, Combination, Business Level Strategy- Customer Focus, Product Differentiation, Product Diversification, Vertical Integration, Strategic Analysis - BCG, GE Nine Cell Matrix, Hofer's Product market Evolution, Factors affecting strategic choice
- Unit 4 Strategy Implementation:** Mc Kinsey's 7S Framework, Types of Organization Structure, Corporate Governance, Corporate Social Responsibility, Corporate values and ethics, Techniques of Strategy Evaluation, Strategic Control and operational Control

References:

- Kazmi, Azhar- Business Policy and Strategic Management, Tata Mc Graw Hill
- V.S Ramaswamy & S.N Ramakumari- Strategy Planning, Corporate Strategy
- Ghemawat, Strategy & The Business Landscape, Pearson Education, Asia
- Business Policy & Strategic Management, Franck Brothers & Co.
- Upendra Kaachru, Strategic Management, Concept & Cases, Excel Books


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Entrepreneurship Development
Subject Code: HM 310/ HM 312- Z 3

Course: BHM&CT 6th Sem

Theory Maximum Marks : 100	Credits :3
Internal Marks	40
External Marks	60

Course Content:

- Unit 1** Entrepreneurship- Definition and framework, classification of entrepreneurs, nature and importance of entrepreneurs, entrepreneurial culture and environment, growth and development of entrepreneurs
- Unit 2:** Emergence of entrepreneurship in Indian industry and business, importance of entrepreneurial development ,entrepreneurial motivation, leadership, decision making ,risk taking ,business planning and time management ,self image, stress and its management perceptions ,attitudes, sensitivity training ,conflict management
- Unit 3:** Establishing Small Scale Units – Formalities to be fulfilled.
- Unit 4:** Government Policies and measures towards promotion of entrepreneurship , governmental and nongovernmental agencies extending training and other infra structural facilities to small entrepreneurs Woman entrepreneurs – areas open for women entrepreneurs.
- Unit 5:** Institutional finance to entrepreneurs, marketing and other managerial assistance to entrepreneurs. Role of SISI and DIC (District Industries Centre) in promotion and entrepreneurship – Industrial Estates.
- Unit 6:** Project management – Starting a new Venture, project identification, project formulation, project report project appraisal institutional assistances .Logical financial and marketing ,role of KSSIDC, KSSOC, KSFC, IFCI, ICCI, SIDBI, ancillary units, location of industries in backward area and tax concession.

References:

- Vasanth Desai Problems and prospects of small-scale industry
- Udia & T V Rao Developing Entrepreneurship
- SVS Sharma Developing Entrepreneurship – Issues and problems, small industry Extension Training.
- Bhanussali Entrpreneurship Development
- S B Srivastava A practical guide to Industrial Entrepreneurs


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

SEVENTH SEMESTER								
	Course Code	Course Title	Contact Hours		Weight age		Total Marks	Credit
			Th.	Pr.	Internal	External		
SEC	HM 401	Communication & Soft Skills in Hospitality	2	2	60	40	100	3
DSE	HM 403	Human Resource Management	4	-	40	60	100	4
DSE	HM 405	Safety, Security & Travel Documentation	4	-	40	60	100	4
DSE	HM 407	Choose Any Three	4	-	40	60	100	4
	HM 409		4	-	40	60	100	4
	HM 411		4	-	40	60	100	4
DSE (Practical)	HM 407	Choose Any Three		2	60	40	100	1
	HM 409			2	60	40	100	1
	HM 411			2	60	40	100	1
Total			22	8			900	26

Elective Table

VII Choose any three	I	Laundry Management
	II	Food Service Management
	III	Accommodation Management
	IV	Culinary Management
	V	Bakery Management
	VI	Front Office Management
	VII	Event Management
	VIII	Foreign Cuisine (Chinese and Italian)


Principal
 NMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Communication & Soft Skills in Hospitality

Course: BHM&CT 7th Sem

Subject Code: HM 401

Theory Maximum Marks : 100	Credits :2
Internal Marks	40
External Marks	60

Course Content:

- Unit 1** Meaning, Definition, Nature and Scope of Communication, Importance of Communication, Process of Communication, Barriers to Effective Communication, Overcoming the Barriers. Non Verbal Communication, Body Language, focus on English skills – Vocabulary, Grammar, Phonetics with special reference to tourism industry.
- Unit 2** Employment Communication: Resume Styles, Resume Writing, Elements of an Effective Resume, Writing Application Letters; Other Employment Messages Job Interview – Purpose, Types, Interview Skills – Before, During and After the Interview, Interview Dressing, mock interviews – Following up an Application, Accepting an Interview Invitation, Following up an Interview, Accepting Employment, Resigning from a Job.
- Unit 3** Introduction to Personality Development: Elements of a Good Personality; Importance of Soft Skills; Introduction to Corporate Culture; Professionalism in Service Industry, Group discussions – structure and types, Mock GD using video samples.
- Unit 4** Presentation skills and techniques: Personal grooming and business etiquettes, corporate etiquette, social etiquette and telephone etiquette, role play and body language, impression management.
- Unit 5** Business Reports: Types and Characteristics; Components of a formal Report; Business Proposals – Types, Contents, Elements
- Unit 6** Cross Cultural Communication: Understanding Cultural and Business Protocol differences across countries – UK, USA, China, Japan, France, and Germany.

References:

- Matila Treece: Successful communication: Allyun and Bacon Pubharkat.
- Jon Lisa Interatid skills in Tourist Travel Industry Longman Group Ltd.
- Robert T. Reilly – Effective communication in tourist travel Industry Dilnas Publication.
- Boves. Thill Business Communication Today Mcycans Hills Publication.
- Dark Studying International Communication Sage Publication.
- Murphy Hilderandt Thomas Effective Business Communication Mc Graw Hill. Additional


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Human Resource Management
Subject Code: HM 403

Course: BHM&CT 7th Sem

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit – 1 Introduction to Human Resource Management:** Introduction, Definition & Concept, Growth Drivers in India, Importance of HRM, Hospitality Industry Characteristics, Human Resource Roles, HR Challenges. Manpower Planning, Process, Managing Workers,
- Unit – 2 Recruitments, Learning & Development, Performance Appraisal:** Recruitments, Introduction, Concept, Sources, What to look for in prospective candidates, Recruitments Policy and Techniques. Learning & Development, Introduction, Concept, Functions, Training Cycle, Evaluation, Methods, Organisational Culture & Training. Performance Appraisal - Introduction, Purpose, Process, Challenges, Underlying Theories, Balance Score Card, The 360 Degree Feedback System, Managing Employee Performance
- Unit – 3 Employee Motivation, Compensation & Benefit Management:** Employee Motivation, Concept, Various Motivation Theories (Maslow's Theory, Herzberg's Theory, Adam's Equity Theory, B.F Skinners Reinforcement Theory), Motivating Employees & Measurement. Compensation & Benefits: Policy, Components, Determinants, Theories, Employee Compensation Practices in India
- Unit – 4 Job Satisfaction, Organisational Culture, Disciplinary Action:** Introduction, Theories of Motivation, Correlates of Job Satisfaction, Importance of Job Satisfaction, Measuring Job Satisfaction. Organisational Culture: Introduction, Observational Aspects, Functions, Cultural

References:

- Human Resource Development & Management in the Hotel Industry – S.K. Bhatia, Nirmal Singh
- Principles and Techniques of Personnel Management Human Resource Management – Dr. Jagmohan Negi
- Human Resource Development Practice in Travel and Tourism – S.C. Bagri
- Human Resource Management in Hospitality – Malay Biswas


Principal
Principal,
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Safety Security & Travel
Documentation**

Course: BHM&CT 7th Sem

Subject Code: HM 405

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit – 1 Safety Security and Hotels:** Understanding Safety & Security, Differentiation between safety and security, Best Practices in Indian Hotels, The Case of Taj & Oberoi at Mumbai, Security Departments in Hotels, Guidelines for Security in Hotels, Dealing with Emergencies - Fire, Death, Crisis Management, Disaster Management.
- Unit – 2 Safety Security and Tourist Destinations:** Understanding the destination images from tourist perspective, the role of the media in influencing consumer perceptions of travel safety Understanding Tourist Security, its importance and impact of tourism industry. Role of Media in influencing tourist perceptions, consumer awareness of travel advisories and their influence on behaviour. Common problems & Challenges with hotel & tourism destinations security. Security issues at airports, railway stations, single woman travellers in India, Tourist Police & Its Role, Role of Ministry of Govt of India, UNWTO Guidelines/ Advises on Safety and Security, International Issues on Tourist Security, the role of insurance in the travel industry
- Unit – 3 Travel Documentation:** Introduction to Travel Documentation, Documentation required while leaving and entering into India. Passport its types and procedures to obtain an Indian passport, Currency Regulations and concept of Basic Travel Quota (BTQ), Custom Regulations, Health Certificates, Insurance and Immigration
- Unit – 4 Understanding VISA and Permits**
Understanding the concept of VISA its types, Categories in which India give Visa to foreign tourists. Visa Requirements and procedure to obtain tourist visa for Singapore, UK, USA and Australia. Restricts and Special area permits for foreign tourists in India and their procedures to obtain. VISA on Arrival Scheme of Govt of India

References:

- Tourism Security: Strategies for Effective Managing Travel Risk and Safety By Peter Tarlow
- Safety and Security in Tourism Relationships, Management and Marketing By C. Michael Hall, Dallen J. Timothy and David Timothy Duval.
- Tourism, Security and Safety (The Management of Hospitality and Tourism Enterprises) - Yoel Mansfeld & Abraham Pizam


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Laundry Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- I

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit-1** **Laundry:** The Concept, Importance, Organisation Structure, Key Roles & People, , Functions of a Laundry, Professional Laundry Set Up, Linen Room, Uniform Room, Tailor Room, Setups & Functions, Equipments Used in laundry, Their Salient Features, Laundry Chemicals, Laundry Do's and Dont's, On Premises Laundry, Off Premises Laundry, Commencing the Day's Work - Briefing, De Briefing, Day Schedules.
- Unit-2** **Laundry Planning & Operations:** The Space, Requirements, Water and Energy Supply & provisions, Financial Aspects, Staff Patterns, Target Clientele, Location, Design, The Laundry Cycle: The collection of linen, sorting, tagging, washing, drying, ironing, storing, mending, discarding, process and precautions. Hotel Laundry Services, Records & Registers
- Unit-3** **Managing Guest Laundry:** Valet Services: Collecting Guest laundry and returns, Do's and Dont's; Handling guests Linens, Stains & Removals, Wash Care Instructions, Ironing and Dry Cleaning Instructions & Practices, Mending and Repairs, Damages and Colour Bleedings, Pricing, Guest Communication & interactions, Promotional Strategy, Effective Customer Service.
- Unit-4** **Emerging Trends in laundry:** Best Practices, Environmental Aspects, Energy Conservation, Ergonomics, Effective Communications & Coordination, Applications of Technology Out Sourcing, New Techniques , Information Systems, Inventories and Audits, Global Practices, Legal and Ethical Issues in Laundry Services, Quality Assurance.

References:

- Accommodation & Cleaning Services, Vol. I & II, David, Allen, Hutchinson
- Hotel and Catering Studies – Ursual Jones
- Hotel House Keeping – Sudhir Andrews Publisher: Tata Mc Graw Hill
- House Keeping Management for Hotels, Rosemary Hurst, Heinemann
- Housekeeping Management – Margaret M. Leappa & Aleta Nitschke
- In House Management by A.K. Bhatiya
- Key of House Keeping by Dr. Lal Commercial
- Housekeeping & Maintenance – Stanley Thornes
- Hotel Housekeeping Operations & Management – Reghubalan, Oxford University Press.
- Management of Hotel & Motel Security (Occupational Safety and Health) By H. Burtein, Publishers: CRC
- Managing Housekeeping Custodial Operation – Edwin B. Feldman
- Managing Housekeeping Operations – Margaret Kappa & Aleta Nitschke
- The Professional Housekeeper - Madelin Schneider, Georgina Tucker & Mary Scoviak, John Wiley & Sons


Principal
 Principal
 MMCT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Food Service Management
Subject Code: HM 407/ HM 409/ HM 411- II

Course: BHM&CT 7th Sem

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit – 1 The Foundations:** The Foodservice Industry, The Systems Approach, The Fundamentals, Food Safety, Cleaning, Sanitation, and Environmental Safety, The Menu
- Unit – 2 The Operational Functions:** Purchasing, Receiving, Storage, And Inventory, Production, Beverage Provision, Food and Beverage Service, Events Conferencing & Banqueting, Apprising Performance, Strategic Decisions,
- Unit – 3 The Facilities:** Facilities Planning And Design, Equipment And Furnishings, Environmental Management
- Unit – 4 The Management Functions:** Organizational Design, Leadership, Human Resource Management, Performance Improvement, Financial Management, Marketing

References

- Food & Beverage Management 3/e John Cousins, David Foskett & Andrew Pennington, Good Fellow Publishers
- Foodservice Management: Principles and Practices by June Payne-Palacio Ph.D. RD and Monica Theis, Prentice Hall Publishers
- Foodservice Management Fundamentals by Dennis R. Reynolds; Wiley Publishers


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Accommodation Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- III

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

Unit – 1 The Housekeeping Department in Hotel Operations, The Executive Housekeeper as Department Manager. Structural Planning of the Housekeeping Department. Current Trends & Practices

Unit – 2 Management of Inventory and Equipment. Characteristics of Housekeeping Equipment and Supplies. The Cleaning Function, Personnel Administration, Controlling Housekeeping Operations, Supervision and Management Practices in Housekeeping

Unit – 3 Safety, Security and Infectious Diseases in Property Operations. Energy Conservation in Lodging Properties, Environmental and Sustainability Issues.

Unit – 4 Opening New Hotels & Role of Housekeeping, Linen Management, Guest Laundry Services, Valet Services, Managing Pests Control, Out Source Management Practices in Housekeeping, Housekeeping Beyond hotels i.e Libraries, Hospitals, Airports and others, Entrepreneurship Opportunities in Housekeeping

References:

- Accommodation & Cleaning Services, Vol. I & II, David, Allen, Hutchinson
- Hotel House Keeping – Sudhir Andrews Publisher: Tata Mc Graw Hill
- House Keeping Management for Hotels, Rosemary Hurst, Heinemann
- Housekeeping Management – Margaret M. Leappa & Aleta Nitschke
- Housekeeping & Maintenance – Stanley Thornes
- Hotel Housekeeping Operations & Management – Reghubalan, Oxford University Press.
- Management of Hotel & Motel Security (Occupational Safety and Health) By H. Burtein, Publishers: CRC
- Managing Housekeeping Custodial Operation – Edwin B. Feldman
- Managing Housekeeping Operations – Margaret Kappa & Aleta Nitschke
- The Professional Housekeeper - Madelin Schneider, Georgina Tucker & Mary Scoviak, John Wiley & Sons
- Housekeeping Management by Matt A Casado, Wiley Publications


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Culinary Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- IV

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit – 1** The Food-Service & Culinary Industry, Sanitation and Safety, Tools and Equipment, Menus, Recipes, and Cost Management, Food Nutrition, Staff Structure & Trends
- Unit – 2** Basic Principles of Cooking and Food Science, Mise en Place, Stocks and Sauces, Soups, Understanding Vegetables, Cooking Vegetables, Potatoes, Legumes, Grains, Pasta, and Other Starches
- Unit – 3** Cooking Methods for Meat, Poultry, and Fish, Understanding Meats and Game, Cooking Meats and Game, Understanding Poultry and Game Birds their cooking, Understanding Fish and Shellfish, their cooking techniques
- Unit – 4** Salad Dressings and Salads, Preservation of Food, Sandwiches, Breakfast Preparation, Dairy and Beverages, Cooking for Vegetarian Diets, Health foods, Sausages and Cured Foods, Pâtés, Terrines, and Other Cold Foods, Food Presentation

References

- Professional Cooking by Wayne Gisslen, Wiley Publications
- The Professional Chef by Culinary Institute of America


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Bakery Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- V

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

Unit – 1 Bakery Introductions: Basic Ingredients: Sugars; Shortenings; Eggs; Wheat and Flours; Milk and Milk Products; Yeast; Chemical Leavening Agents; Salt, Spices, and Flavourings; Cocoa and Chocolate; Fruits. Professional Bakery Equipments & Tools, Production Factors; Staling;

Unit – 2 Bread and Rolls: Overview of Production; Common Problems; White Pan Bread ; Pullman, Split-top, and Round Split Breads; French and Italian Breads and Rolls; Vienna Bread; Bolillos; Pan de Agua; Egg Bread and Rolls; Hard Roll Varieties; Soft Roll Varieties; Pan de Sal; Rye Bread Varieties; Commel Bread; Whole Wheat Bread; Raisin Bread; Cheese Bread; Indigenous Breads of India; Middle Eastern Pita Bread;

Unit – 3 Sweet Yeast Dough Products: Danish Pastry; Buns; Coffee Cake Dough Products; Specialty Rolls and Yeast-Raised Cakes; Croissants; Doughnuts and Crullers: Preparation for Frying; Finishing Doughnuts; Use of Prepared Mixes; Yeast-raised Doughnuts; Cake Doughnuts; Combination Doughnuts; Whole Wheat Doughnuts; Common Problems with Doughnuts and Crullers.

Unit – 4 Pastries: Short Dough Pastries; Puff Pastries; Common Problems with Puff Pastries; Eclairs and Cream Puffs; Common Problems with Eclairs and Cream Puffs; Cream Cheese Dough Products; Icings and Cream and Whipped Toppings: Icings; Cream Toppings; Whipped Toppings. Cakes and Cake Specialties: Cake Production; Common Problems with Cake Production; Creamed Cakes; Common Problems with Creamed Cakes; Whipped Cakes; Common Problems with Sponge Cakes;

References

- Practical Baking, 5th Edition by William J. Sultan Wiley Publications
- Baking and Pastry: Mastering the Art by The Culinary Institute of America, Wiley Publications
- In the Hands of a Baker <http://www.ciaprochef.com/>
- Baking by Marha Dey , www.hermehouse.com
- The Golden Book of Baking by barronsduc www.barronseduc.com


Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

Subject Name: Front Office Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- VI

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit – 1** Hotel Front Office and Role in Hotel Revenue Generations, Preparing for Guest Services, Relationship & Coordination with Housekeeping and other Divisions, The Hotel Organization and the front office manager, Effective interdepartmental communications, Front Office Structures, layouts Trends & Practices.
- Unit – 2** Managing Guests from Check in to Check Out – Role of Front Office, Property management systems, System wide reservations, Guest registration, Managing the financials, Guest checkout, Procedures Forms & Formats
- Unit – 3** Revenue Management : An Introduction, Customers' Knowledge and Consumer Behavior, Internal Assessment and Competitive Analysis, Economic Principles and Demand Forecasting, Reservations and Channels of Distribution, Dynamic Value-Based Pricing, Channel and Inventory Management, The Revenue Management Team, Strategic Management and Following the RevMAP, Tools, Tactics, and Resources
- Unit – 4** Staffing Challenges, Recruitments & Training, Managing Hospitality, Promoting in house sales, It is going to happen- Handling Emergencies, Managing Guest Safety & security Gearing for Interviews, The role of Supervisor and Managers Responsibilities.

References:

- Hotel Front Office Management – James A Bardi Wiley Publications
- Introduction to the revenue management for Hospitality Industry, Principles and Practices for the Real World, An Kimberly Tranter, Trevor Stuart-Hill, Juston Parker, Pearson Publications


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Event Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- VII

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit - 1** **Events-** The Concept, Nature, Definition and scope, C's of Events, advantage and disadvantage of Events, Categories and Typologies, Skills required to be a good Event Planners.
- Unit - 2** **Organising & Designing of Events,** key elements of Events, Event Infrastructure, core concept, core people, core talent, core structure, Setting Objectives for the Event, Negotiating Contracts with event Organizers, Venue, Media.
- Unit - 3** **Marketing & Promotion of Events:** Nature of Event Marketing, Process of Event Marketing, The Marketing Mix, Sponsorship. Promotion: Image/ Branding, Advertising, Publicity and Public Relation.
- Unit - 4** **Managing Events:** Financial Management of Events, Staffing, Leadership. Safety and Security: Occupational Safety and Health, Incident Reporting, Crowd Management and Evacuation.

References:

- A.K. Bhatia, 'Event Management', Sterling Publishers Pvt. Ltd. Delhi.
- Anton Shone & Bryn Parry, 'Successful Event ;2Management
- Coleman, Lee & Frankle, Powerhouse Conferences. Educational Institute of AHMA
- Hoyle, Dorf & Jones, Meaning conventions & Group business. Educational institute of AH & MA.
- Joe Jeff Goldblatt, "Special Events: Best Practices in Modern Event Management (Hospitality, Travel & Tourism)", John Willy and Sons, New York
- Leonard H. Hoyle, Jr, 'Event Marketing', John Willy and Sons, New York
- Lynn Van Der Wagen, Carlos, Event Management, Pearson, New Delhi.
- Sanjay Singh Gaur, Sanjay V Saggere, Event Marketing Management, Vikas Publication, New Delhi
- John Beech, Sebastian Kaiser, Robert Kaspar - The Business of Events Management ;Pearson Publications


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Foreign Cuisine
(Chinese and Italian)**

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- VIII

Theory Maximum Marks : 100	Credits :4
Internal Marks	40
External Marks	60

Course Content:

- Unit – 1** **Cuisine of China- I:** - Introduction to Chinese Cuisine, Historical Background, Regions & Regional Cooking Styles, Staple food with regional Influences
- Unit – 2** **Cuisine of China-II:** Methods of cooking, Equipment & utensils, Ingredients & Dishes
- Unit – 3** **Cuisine of Italy - I:** - Introduction to Italian Cuisine, Historical Background, Regions & Regional Cooking Styles, Staple food with regional Influences
- Unit – 4** **Cuisine of Italy - II:** Methods of cooking, Equipment & utensils, Ingredients & Dishes

References

- Nita Mehta – Italian Vegetarian Cookery, Snab Publishers.
- Alberto Capatti - Arts and Traditions of the Table: Perspectives on Culinary History, Columbia University Press
- Italian Cooking by Sanjeev Kapoor
- Ken Hom – Chinese Cookery, BBC Books
- Funchsia Dunlop - The Revolutionary Chinese Cookbook, Ebury Press
- Eileen Yin-Fei Lo – Mastering the Art of Chinese Cooking, Chronicle Books
- Su Huei Huang, Lai Yen-Jen – Chinese Cuisine, Wei-Chuan Publishing
- E N Anderson – The Food of China, Yale University Press
- Parvinder S Bali – International Cuisine & Food Production – Oxford University Press


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Laundry Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- I Pr

Practical Maximum Marks : 100		Credits :1
Internal Marks	60	
External Marks	40	

Practical

Room/Laundry

Stain Removal


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Food Service Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- II Pr

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

Note: An Event may be planned to supplement learning of students and practical may be conducted in view of theory syllabus to provide practical inputs to learners.

- Layout of Food Service Outlets & Organisations
- Food Service Operations
- Conferencing & Banqueting
- Equipment and Furnishings, Environmental Management in Food Service Operations
- Visit to a professional Food Service Outlet


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Accommodation Management
Subject Code: HM 407/ HM 409/ HM 411- III Pr

Course: BHM&CT 7th Sem

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

Note: An Event may be planned to supplement learning of students and practical may be conducted in view of theory syllabus to provide practical inputs to learners.

- Layout of Housekeeping Outlets & Organisations
- Housekeeping Operations
- Safety & Security Practices & Housekeeping
- Equipment and Furnishings, Environmental Management in Housekeeping Operations
- Visit to a professional Housekeeping Services/ Units


Principal
Principal,
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Culinary Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- IV Pr

Practical Maximum Marks : 100		Credits :1
Internal Marks	60	
External Marks	40	

Practical

- Menu Planning – The Chefs Role
- Professional Kitchen Layout & Organisations
- Culinary Operations : Menu Preparations to supplement theory syllabus
- Safety & Security Practices & Kitchen
- Equipment and Furnishings, Environmental Management in Culinary Operations


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Bakery Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- V Pr

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

- Bakery Planning – The Chefs Role
- Professional Bakery Layout & Organisations
- Bakery Operations : Dishes Preparations to supplement theory syllabus
- Safety & Security Practices & Bakery
- Equipment and Tools, Hygiene Management in Bakery Operations


Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Front Office Management

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- VI Pr

Practical Maximum Marks : 100	Credits :1
Internal Marks	60
External Marks	40

Practical

- Front Office Planning – The FOM's Role
- Professional Front Office Layout & Organisations
- Front Office Operations : Activities, Records & Regulations to supplement theory syllabus
- Safety & Security Practices & Role of Hotel Front Office
- Revenue Management in Front Office Operations


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

Subject Name: Event Management
Code: HM 407/ HM 409/ HM 411- VII Pr

Course: BHM&CT 7th Sem Subject

Practical Maximum Marks : 100		Credits :1
Internal Marks	60	
External Marks	40	

Practical

Practicals will be conducted as per theory syllabus.

Note: An Event such as Conference/ Seminar may be planned and organised to supplement learning of students.


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

**Subject Name: Foreign Cuisine
(Chinese and Italian)**

Course: BHM&CT 7th Sem

Subject Code: HM 407/ HM 409/ HM 411- VIII Pr

Practical Maximum Marks : 100		Credits : 1
Internal Marks	60	
External Marks	40	

Practical

May be planned in accordance to theory (Suggested Menus include)

MENU 01 Prawn Ball Soup, Fried Wantons, Sweet & Sour Pork Hakka Noodles

MENU 02 Hot & Sour soup, Beans Sichwan, Stir Fried Chicken & Peppers Chinese Fried Rice

MENU 03 Sweet Corn Soup, Shao Mai, Tung-Po Mutton, Yangchow Fried Rice,

MENU 04 Wonton Soup, Spring Rolls, Stir Fried Preparations & Celery Chow Mein,

MENU 05 Prawns in Garlic Sauce, Fish Szechwan, Hot & Sour Cabbage, Steamed Noodles


Principal
Principal
MMICT & BM (Hotel Management)
Maharishi Markandeshwar
(Deemed to be University)
Mullana, Ambala-133207

EIGHTH SEMESTER								
	Course Code	Course Title	Evaluation Criteria	Contact Hours	Weight age		Total Marks	Credit
				Pr.	Internal	External		
Compulsory	HM 402	Industrial Training	Training Log Book/ Training Report	22 Weeks	100	-	100	22
	HM 404		Presentation		100	-	100	
	HM 406		Viva - Voce		-	100	100	
			Total	22 weeks			300	22


Principal
 Principal
 MMICT & BM (Hotel Management)
 Maharishi Markandeshwar
 (Deemed to be University)
 Mullana, Ambala-133207

PHARMACEUTICS(MPH)

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (MPH 101T)

Scope

This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.

Objectives

After completion of course student is able to know,

- Chemicals and Excipients
- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instruments

THEORY

60 HOURS

1. a. UV-Visible spectroscopy: Introduction, Theory, Laws, Instrumentation associated with UV-Visible spectroscopy, Choice of solvents and solvent effect and Applications of UV-Visible spectroscopy. 11 Hrs
- b. IR spectroscopy: Theory, Modes of Molecular vibrations, Sample handling, Instrumentation of Dispersive and Fourier - Transform IR Spectrometer, Factors affecting vibrational frequencies and Applications of IR spectroscopy
- c. Spectrofluorimetry: Theory of Fluorescence, Factors affecting fluorescence, Quenchers, Instrumentation and Applications of fluorescence spectrophotometer.
- d. Flame emission spectroscopy and Atomic absorption spectroscopy: Principle, Instrumentation, Interferences and Applications.
2. NMR spectroscopy: Quantum numbers and their role in NMR, Principle, Instrumentation, Solvent requirement in NMR, Relaxation process, NMR signals in various compounds, Chemical shift, Factors influencing chemical shift, Spin-Spin coupling, Coupling constant, Nuclear magnetic double resonance, Brief outline of principles of FT-NMR and ¹³C NMR. Applications of NMR spectroscopy. 11 Hrs

- 3 Mass Spectroscopy: Principle, Theory, Instrumentation of Mass Spectroscopy, Different types of ionization like electron impact, chemical, field, FAB and MALDI, APCI, ESI, APPI Analyzers of Quadrupole and Time of Flight, Mass fragmentation and its rules, Meta stable ions, Isotopic peaks and Applications of Mass spectroscopy 11 Hrs
- 4 Chromatography: Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution and applications of the following: 11 Hrs
 a) Paper chromatography b) Thin Layer chromatography
 c) Ion exchange chromatography d) Column chromatography
 e) Gas chromatography f) High Performance Liquid chromatography
 g) Affinity chromatography
- 5 a. Electrophoresis: Principle, Instrumentation, Working conditions, factors affecting separation and applications of the following: 11 Hrs
 a) Paper electrophoresis b) Gel electrophoresis c) Capillary electrophoresis d) Zone electrophoresis e) Moving boundary electrophoresis f) Iso electric focusing
 b. X ray Crystallography: Production of X rays, Different X ray diffraction methods, Bragg's law, Rotating crystal technique, X ray powder technique, Types of crystals and applications of X-ray diffraction.
- 6 Immunological assays : RIA (Radio immuno assay), ELISA, Bioluminescence assays. 5 Hrs

REFERENCES

1. Spectrometric Identification of Organic compounds - Robert M Silverstein, Sixth edition, John Wiley & Sons, 2004.
2. Principles of Instrumental Analysis - Doglas A Skoog, F. James Holler, Timothy A. Nieman, 5th edition, Eastern press, Bangalore, 1998.
3. Instrumental methods of analysis - Willards, 7th edition, CBS publishers.
4. Practical Pharmaceutical Chemistry - Beckett and Stenlake, Vol II, 4th edition, CBS Publishers, New Delhi, 1997.
5. Organic Spectroscopy - William Kemp, 3rd edition, ELBS, 1991.
6. Quantitative Analysis of Drugs in Pharmaceutical formulation - P D Sethi, 3rd Edition, CBS Publishers, New Delhi, 1997.
7. Pharmaceutical Analysis- Modern methods - Part B - J W Munson, Volume 11, Marcel Dekker Series

DRUG DELIVERY SYSTEMS (MPH 102T)

SCOPE

This course is designed to impart knowledge on the area of advances in novel drug delivery systems.

OBJECTIVES

Upon completion of the course, student shall be able to understand

The various approaches for development of novel drug delivery systems.

The criteria for selection of drugs and polymers for the development of delivering system

The formulation and evaluation of Novel drug delivery systems..

THEORY

60 Hrs

- | | | |
|----|--|-----------|
| 1. | Sustained Release(SR) and Controlled Release (CR) formulations: Introduction & basic concepts, advantages/disadvantages, factors influencing, Physicochemical & biological approaches for SR/CR formulation, Mechanism of Drug Delivery from SR/CR formulation. Polymers: introduction, definition, classification, properties and application Dosage Forms for Personalized Medicine: Introduction, Definition, Pharmacogenetics, Categories of Patients for Personalized Medicines: Customized drug delivery systems, Bioelectronic Medicines, 3D printing of pharmaceuticals, Telepharmacy. | 10
Hrs |
| 2 | Rate Controlled Drug Delivery Systems: Principles & Fundamentals, Types, Activation; Modulated Drug Delivery Systems; Mechanically activated, pH activated, Enzyme activated, and Osmotic activated Drug Delivery Systems Feedback regulated Drug Delivery Systems; Principles & Fundamentals. | 10
Hrs |
| 3 | Gastro-Retentive Drug Delivery Systems: Principle, concepts advantages and disadvantages, Modulation of GI transit time approaches to extend GI transit. Buccal Drug Delivery Systems: Principle of muco adhesion, advantages and disadvantages, Mechanism of drug permeation, Methods of formulation and its evaluations. | 10
Hrs |
| 4 | Ocular Drug Delivery Systems: Barriers of drug permeation, Methods to overcome barriers. | 06
Hrs |

- | | | |
|---|--|-----------|
| 5 | Transdermal Drug Delivery Systems: Structure of skin and barriers, Penetration enhancers, Transdermal Drug Delivery Systems, Formulation and evaluation. | 10
Hrs |
| 6 | Protein and Peptide Delivery: Barriers for protein delivery. Formulation and Evaluation of delivery systems of proteins and other macromolecules. | 08
Hrs |
| 7 | Vaccine delivery systems: Vaccines, uptake of antigens, single shot vaccines, mucosal and transdermal delivery of vaccines. | 06
Hrs |

REFERENCES

1. Y W. Chien, Novel Drug Delivery Systems, 2nd edition, revised and expanded, Marcel Dekker, Inc., New York, 1992.
2. Robinson, J. R., Lee V. H. L, Controlled Drug Delivery Systems, Marcel Dekker, Inc., New York, 1992.
3. Encyclopedia of controlled delivery, Editor- Edith Mathiowitz, Published by WileyInterscience Publication, John Wiley and Sons, Inc, New York! Chichester/Weinheim
4. N.K. Jain, Controlled and Novel Drug Delivery, CBS Publishers & Distributors, New Delhi, First edition 1997 (reprint in 2001).
5. S.P.Vyas and R.K.Khar, Controlled Drug Delivery - concepts and advances, Vallabh Prakashan, New Delhi, First edition 2002

JOURNALS

1. Indian Journal of Pharmaceutical Sciences (IPA)
2. Indian drugs (IDMA)
3. Journal of controlled release (Elsevier Sciences) desirable
4. Drug Development and Industrial Pharmacy (Marcel & Decker) desirable

MODERN PHARMACEUTICS (MPH 103T)

Scope

Course designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries

Objectives

Upon completion of the course, student shall be able to understand

- The elements of preformulation studies.
- The Active Pharmaceutical Ingredients and Generic drug Product development
- Industrial Management and GMP Considerations.
- Optimization Techniques & Pilot Plant Scale Up Techniques
- Stability Testing, sterilization process & packaging of dosage forms.

THEORY

60 HRS

- | | | |
|----|---|--------|
| 1. | a. Preformation Concepts – Drug Excipient interactions - different methods, kinetics of stability, Stability testing. Theories of dispersion and pharmaceutical Dispersion (Emulsion and Suspension, SMEDDS) preparation and stability Large and small volume parental – physiological and formulation consideration, Manufacturing and evaluation. | 10 Hrs |
| | b. Optimization techniques in Pharmaceutical Formulation: Concept and parameters of optimization, Optimization techniques in pharmaceutical formulation and processing. Statistical design, Response surface method, Contour designs, Factorial designs and application in formulation | 10 Hrs |
| 2 | Validation : Introduction to Pharmaceutical Validation, Scope & merits of Validation, Validation and calibration of Master plan, ICH & WHO guidelines for calibration and validation of equipments, Validation of specific dosage form, Types of validation. Government regulation, Manufacturing Process Model, URS, DQ, IQ, OQ & P.Q. of facilities. | 10 Hrs |
| 3 | cGMP & Industrial Management: Objectives and policies of current good manufacturing practices, layout of buildings, services, equipments and their maintenance Production management: Production organization, , materials management, handling and transportation, inventory management and control, production and planning control, Sales forecasting, budget and cost control, industrial and personal relationship. Concept of Total Quality Management. | 10 Hrs |

- 4 Compression and compaction: Physics of tablet compression, 10
compression, consolidation, effect of friction, distribution of Hrs
forces, compaction profiles. Solubility.
- 5 Study of consolidation parameters; Diffusion parameters, 10
Dissolution parameters and Pharmacokinetic parameters, Heckel Hrs
plots, Similarity factors – f_2 and f_1 , Higuchi and Peppas plot,
Linearity Concept of significance, Standard deviation, Chi square
test, students T-test, ANOVA test.

REFERENCES

1. Theory and Practice of Industrial Pharmacy By Lachmann and Libermann
2. Pharmaceutical dosage forms: Tablets Vol. 1-3 by Leon Lachmann.
3. Pharmaceutical Dosage forms: Disperse systems, Vol, 1-2; By Leon Lachmann.
4. Pharmaceutical Dosage forms: Parenteral medications Vol. 1-2; By Leon Lachmann.
5. Modern Pharmaceutics; By Gillbert and S. Banker.
6. Remington's Pharmaceutical Sciences.
7. Advances in Pharmaceutical Sciences Vol. 1-5; By H.S. Bean & A.H. Beckett.
8. Physical Pharmacy; By Alfred martin
9. Bentley's Textbook of Pharmaceutics – by Rawlins.
10. Good manufacturing practices for Pharmaceuticals: A plan for total quality control, Second edition; By Sidney H. Willig.
11. Quality Assurance Guide; By Organization of Pharmaceutical producers of India.
12. Drug formulation manual; By D.P.S. Kohli and D.H. Shah. Eastern publishers, New Delhi.
13. How to practice GMPs; By P.P. Sharma. Vandhana Publications, Agra.
14. Pharmaceutical Process Validation; By Fra. R. Berry and Robert A. Nash.
15. Pharmaceutical Preformulations; By J.J. Wells.
16. Applied production and operations management; By Evans, Anderson, Sweeney and Williams.
17. Encyclopaedia of Pharmaceutical technology, Vol I – III.

REGULATORY AFFAIRS (MPH 104T)

Scope

Course designed to impart advanced knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents : filing process of IND, NDA and ANDA

- To know the approval process of
- To know the chemistry, manufacturing controls and their regulatory importance
- To learn the documentation requirements for
- To learn the importance and

Objectives:

Upon completion of the course, it is expected that the students will be able to understand

- The Concepts of innovator and generic drugs, drug development process
- The Regulatory guidance's and guidelines for filing and approval process
- Preparation of Dossiers and their submission to regulatory agencies in different countries
- Post approval regulatory requirements for actives and drug products
- Submission of global documents in CTD/ eCTD formats
- Clinical trials requirements for approvals for conducting clinical trials
- Pharmacovigilence and process of monitoring in clinical trials.

THEORY

60 Hrs

1. a. Documentation in Pharmaceutical industry: Master formula record, DMF (Drug Master File), distribution records. Generic drugs product development Introduction , Hatch-Waxman act and amendments, CFR (CODE OF FEDERAL REGULATION) ,drug product performance, in-vitro, ANDA regulatory approval process, NDA approval process, BE and drug product assessment, in -vivo, scale up process approval changes, post marketing surveillance, outsourcing BA and BE to CRO.
b. Regulatory requirement for product approval: API, biologics, novel, therapies obtaining NDA, ANDA for generic drugs ways and means of US registration for foreign drugs

- | | | |
|---|---|-----------|
| 2 | CMC, post approval regulatory affairs. Regulation for combination products and medical devices.CTD and ECTD format, industry and FDA liaison. ICH - Guidelines of ICH-Q, S E, M. Regulatory requirements of EU, MHRA, TGA and ROW countries. | 12
Hrs |
| 3 | Non clinical drug development: Global submission of IND, NDA, ANDA. Investigation of medicinal products dossier, dossier (IMPD) and investigator brochure (IB). | 12
Hrs |
| 4 | Clinical trials: Developing clinical trial protocols. Institutional review board/ independent ethics committee Formulation and working procedures informed Consent process and procedures. HIPAA- new, requirement to clinical study process, pharmacovigilance safety monitoring in clinical trials. | 12
Hrs |

REFERENCES

1. Generic Drug Product Development, Solid Oral Dosage forms, Leon Shargel and IsaderKaufer,Marcel Dekker series, Vol.143
2. The Pharmaceutical Regulatory Process, Second Edition Edited by Ira R. Berry and Robert P.Martin, Drugs and the Pharmaceutical Sciences,Vol.185, Informa Health care Publishers.
3. New Drug Approval Process: Accelerating Global Registrations By Richard A Guarino, MD,5th edition, Drugs and the Pharmaceutical Sciences,Vol.190.
4. Guidebook for drug regulatory submissions / Sandy Weinberg. By John Wiley & Sons.Inc.
5. FDA regulatory affairs: a guide for prescription drugs, medical devices, and biologics/edited By Douglas J. Pisano, David Mantus.
6. Clinical Trials and Human Research: A Practical Guide to Regulatory Compliance By Fay A.Rozovsky and Rodney K. Adams
7. www.ich.org/
8. www.fda.gov/
9. europa.eu/index_en.htm
10. <https://www.tga.gov.au/tga-basics>

PHARMACEUTICS PRACTICALS - I
(MPH 105P)

1. Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
2. Simultaneous estimation of multi component containing formulations by UV spectrophotometry
3. Experiments based on HPLC
4. Experiments based on Gas Chromatography
5. Estimation of riboflavin/quinine sulphate by fluorimetry
6. Estimation of sodium/potassium by flame photometry
7. To perform In-vitro dissolution profile of CR/ SR marketed formulation
8. Formulation and evaluation of sustained release matrix tablets
9. Formulation and evaluation osmotically controlled DDS
10. Preparation and evaluation of Floating DDS- hydro dynamically balanced DDS
11. Formulation and evaluation of Muco adhesive tablets.
12. Formulation and evaluation of trans dermal patches.
13. To carry out preformulation studies of tablets.
14. To study the effect of compressional force on tablets disintegration time.
15. To study Micromeritic properties of powders and granulation.
16. To study the effect of particle size on dissolution of a tablet.
17. To study the effect of binders on dissolution of a tablet.
18. To plot Heckal plot, Higuchi and peppas plot and determine similarity factors.

**MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY &
TARGETED DDS) (NTDS)
(MPH 201T)**

Scope

This course is designed to impart knowledge on the area of advances in novel drug delivery systems.

Objectives

Upon completion of the course student shall be able to understand

- The various approaches for development of novel drug delivery systems.
- The criteria for selection of drugs and polymers for the development of NTDS
- The formulation and evaluation of novel drug delivery systems.

THEORY

60 Hrs

- | | | |
|----|--|-----------|
| 1. | Targeted Drug Delivery Systems: Concepts, Events and biological process involved in drug targeting. Tumor targeting and Brain specific delivery. | 12
Hrs |
| 2 | Targeting Methods: introduction preparation and evaluation. Nano Particles & Liposomes: Types, preparation and evaluation. | 12
Hrs |
| 3 | Micro Capsules / Micro Spheres: Types, preparation and evaluation , Monoclonal Antibodies ; preparation and application, preparation and application of Niosomes, Aquasomes, Phytosomes, Electrosomes. | 12
Hrs |
| 4 | Pulmonary Drug Delivery Systems : Aerosols, propellents, ContainersTypes, preparation and evaluation, Intra Nasal Route Delivery systems; Types, preparation and evaluation. | 12
Hrs |
| 5 | Nucleic acid based therapeutic delivery system : Gene therapy, introduction (ex-vivo & in-vivo gene therapy). Potential target diseases for gene therapy (inherited disorder and cancer). Gene expression systems (viral and nonviral gene transfer). Liposomal gene delivery systems. Biodistribution and Pharmacokinetics. knowledge of therapeutic antisense molecules and aptamers as drugs of future. | 12
Hrs |

REFERENCES

1. Y W. Chien, Novel Drug Delivery Systems, 2nd edition, revised and expanded, Marcel Dekker, Inc., New York, 1992.
2. S.P.Vyas and R.K.Khar, Controlled Drug Delivery - concepts and advances, VallabhPrakashan, New Delhi, First edition 2002.
3. N.K. Jain, Controlled and Novel Drug Delivery, CBS Publishers & Distributors, NewDelhi, First edition 1997 (reprint in 2001).

ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS (MPH 202T)

Scope

This course is designed to impart knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving. Basic theoretical discussions of the principles of biopharmaceutics and pharmacokinetics are provided to help the students' to clarify the concepts.

Objectives

Upon completion of this course it is expected that students will be able understand,

- The basic concepts in biopharmaceutics and pharmacokinetics.
- The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
- The critical evaluation of biopharmaceutic studies involving drug product equivalency.
- The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
- The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic

THEORY

60 Hrs

1. Drug Absorption from the Gastrointestinal Tract: 12 Hrs
Gastrointestinal tract, Mechanism of drug absorption, Factors affecting drug absorption, pH-partition theory of drug absorption. Formulation and physicochemical factors: Dissolution rate, Dissolution process, Noyes-Whitney equation and drug dissolution, Factors affecting the dissolution rate. Gastrointestinal absorption: role of the dosage form: Solution (elixir, syrup and solution) as a dosage form, Suspension as a dosage form, Capsule as a dosage form, Tablet as a dosage form, Dissolution methods, Formulation and processing factors, Correlation of in vivo data with in vitro dissolution data. Transport model: Permeability-Solubility-Charge State and the pH Partition Hypothesis, Properties of the Gastrointestinal Tract (GIT), pH Microclimate Intracellular pH Environment, Tight-Junction Complex.

- | | | |
|---|---|-----------|
| 2 | Biopharmaceutic considerations in drug product design and In Vitro Drug Product Performance: Introduction, biopharmaceutic factors affecting drug bioavailability, rate-limiting steps in drug absorption, physicochemical nature of the drug formulation factors affecting drug product performance, in vitro: dissolution and drug release testing, compendial methods of dissolution, alternative methods of dissolution testing, meeting dissolution requirements, problems of variable control in dissolution testing performance of drug products. In vitro–in vivo correlation, dissolution profile comparisons, drug product stability, considerations in the design of a drug product. | 12
Hrs |
| 3 | Pharmacokinetics: Basic considerations, pharmacokinetic models, compartment modeling: one compartment model- IV bolus, IV infusion, extra-vascular. Multi compartment model: two compartment - model in brief, non-linear pharmacokinetics: cause of non-linearity, Michaelis – Menten equation, estimation of k_{max} and v_{max} . Drug interactions: introduction, the effect of protein-binding interactions, the effect of tissue-binding interactions, cytochrome p450-based drug interactions, drug interactions linked to transporters. | 12
Hrs |
| 4 | Drug Product Performance, In Vivo: Bioavailability and Bioequivalence: drug product performance, purpose of bioavailability studies, relative and absolute availability. methods for assessing bioavailability, bioequivalence studies, design and evaluation of bioequivalence studies, study designs, crossover study designs, evaluation of the data, bioequivalence example, study submission and drug review process. biopharmaceutics classification system, methods. Permeability: In-vitro, in-situ and In-vivo methods. generic biologics (biosimilar drug products), clinical significance of bioequivalence studies, special concerns in bioavailability and bioequivalence studies, generic substitution. | 12
Hrs |
| 5 | Application of Pharmacokinetics: Modified-Release Drug Products, Targeted Drug Delivery Systems and Biotechnological Products. Introduction to Pharmacokinetics and pharmacodynamic, drug interactions. Pharmacokinetics and pharmacodynamics of biotechnology drugs. Introduction, Proteins and peptides, Monoclonal antibodies, Oligonucleotides, Vaccines (immunotherapy), Gene therapies. | 12
Hrs |

REFERENCES

1. Biopharmaceutics and Clinical Pharmacokinetics by Milo Gibaldi, 4th edition, Philadelphia, Lea and Febiger, 1991
2. Biopharmaceutics and Pharmacokinetics, A. Treatise, D .M. Brahmarkar and Sunil B. Jaiswal., VallabPrakashan, Pitampura, Delhi
3. Applied Biopharmaceutics and Pharmacokinetics by Shargel. Land YuABC, 2nd edition, Connecticut Appleton Century Crofts, 1985
4. Textbook of Biopharmaceutics and Pharmacokinetics, Dr. Shobha Rani R. Hiremath, Prism Book
5. Pharmacokinetics by Milo Gibaldi and D. Perrier, 2nd edition, Marcel Dekker Inc., New York, 1982
6. Current Concepts in Pharmaceutical Sciences: Biopharmaceutics, Swarbrick. J, Lea and Febiger, Philadelphia, 1970
7. Clinical Pharmacokinetics, Concepts and Applications 3rd edition by Malcolm Rowland and Thom~N. Tozer, Lea and Febiger, Philadelphia, 1995
8. Dissolution, Bioavailability and Bioequivalence, Abdou. H.M, Mack Publishing Company, Pennsylvania 1989
9. Biopharmaceutics and Clinical Pharmacokinetics, An Introduction, 4th edition, revised and expanded by Robert. E. Notari, Marcel Dekker Inc, New York and Basel, 1987.
10. Biopharmaceutics and Relevant Pharmacokinetics by John. G Wagner and M. Pamarowski, 1st edition, Drug Intelligence Publications, Hamilton, Illinois, 1971.
11. Encyclopedia of Pharmaceutical Technology, Vol 13, James Swarbrick, James. G. Boylan, Marcel Dekker Inc, New York, 1996.
12. Basic Pharmacokinetics, 1st edition, Sunil S Jambhekar and Philip J Breen, pharmaceutical press, RPS Publishing, 2009.
13. Absorption and Drug Development- Solubility, Permeability, and Charge State, Alex Avdeef, John Wiley & Sons, Inc, 2003.

COMPUTER AIDED DRUG DEVELOPMENT (MPH 203T)

Scope

This course is designed to impart knowledge and skills necessary for computer Applications in pharmaceutical research and development who want to understand the application of computers across the entire drug research and development process. Basic theoretical discussions of the principles of more integrated and coherent use of computerized information (informatics) in the drug development process are provided to help the students to clarify the concepts.

Objectives

Upon completion of this course it is expected that students will be able to understand,

- History of Computers in Pharmaceutical Research and Development
- Computational Modeling of Drug Disposition
- Computers in Preclinical Development
- Optimization Techniques in Pharmaceutical Formulation
- Computers in Market Analysis
- Computers in Clinical Development
- Artificial Intelligence (AI) and Robotics
- Computational fluid dynamics(CFD)

THEORY

60 Hrs

1. a. Computers in Pharmaceutical Research and Development: A General Overview: History of Computers in Pharmaceutical Research and Development. Statistical modeling in Pharmaceutical research and development: Descriptive versus Mechanistic Modeling, Statistical Parameters, Estimation, Confidence Regions, Nonlinearity at the Optimum, Sensitivity Analysis, Optimal Design, Population Modeling
b. Quality-by-Design In Pharmaceutical Development: Introduction, ICH Q8 guideline, Regulatory and industry views on QbD, Scientifically based QbD - examples of application. 12 Hrs
- 2 Computational Modeling Of Drug Disposition: Introduction ,Modeling Techniques: Drug Absorption, Solubility, Intestinal Permeation, Drug Distribution ,Drug Excretion, Active Transport; P-gp, BCRP, Nucleoside Transporters, hPEPT1, ASBT, OCT, OATP, BBB-Choline Transporter. 12 Hrs

- | | | |
|---|--|-----------|
| 3 | Computer-aided formulation development:: Concept of optimization, Optimization parameters, Factorial design, Optimization technology & Screening design. Computers in Pharmaceutical Formulation: Development of pharmaceutical emulsions, microemulsion drug carriers Legal Protection of Innovative Uses of Computers in R&D, The Ethics of Computing in Pharmaceutical Research, Computers in Market analysis | 12
Hrs |
| 4 | <p>a. Computer-aided biopharmaceutical characterization: Gastrointestinal absorption simulation. Introduction, Theoretical background, Model construction, Parameter sensitivity analysis, Virtual trial, Fed vs. fasted state, In vitro dissolution and in vitro-in vivo correlation, Biowaiver considerations</p> <p>b. Computer Simulations in Pharmacokinetics and Pharmacodynamics: Introduction, Computer Simulation: Whole Organism, Isolated Tissues, Organs, Cell, Proteins and Genes.</p> <p>c. Computers in Clinical Development: Clinical Data Collection and Management, Regulation of Computer Systems</p> | 12
Hrs |
| 5 | Artificial Intelligence (AI), Robotics and Computational fluid dynamics: General overview, Pharmaceutical Automation, Pharmaceutical applications, Advantages and Disadvantages. Current Challenges and Future Directions. | 12
Hrs |

REFERENCES

1. Computer Applications in Pharmaceutical Research and Development, Sean Ekins, 2006, John Wiley & Sons.
2. Computer-Aided Applications in Pharmaceutical Technology, 1st Edition, Jelena Djuris, Woodhead Publishing
3. Encyclopedia of Pharmaceutical Technology, Vol 13, James Swarbrick, James. G.Boylan, Marcel Dekker Inc, New York, 1996.

COSMETICS AND COSMECEUTICALS (MPH 204T)

Scope

This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.

Objectives

Upon completion of the course, the students shall be able to understand

- Key ingredients used in cosmetics and cosmeceuticals.
- Key building blocks for various formulations.
- Current technologies in the market
- Various key ingredients and basic science to develop cosmetics and cosmeceuticals
- Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.

THEORY

60 Hrs

- | | | |
|----|--|-----------|
| 1. | Cosmetics – Regulatory : Definition of cosmetic products as per Indian regulation. Indian regulatory requirements for labeling of cosmetics Regulatory provisions relating to import of cosmetics., Misbranded and spurious cosmetics. Regulatory provisions relating to manufacture of cosmetics – Conditions for obtaining license, prohibition of manufacture and sale of certain cosmetics, loan license, offences and penalties. | 12
Hrs |
| 2 | Cosmetics - Biological aspects : Structure of skin relating to problems like dry skin, acne, pigmentation, prickly heat, wrinkles and body odor. Structure of hair and hair growth cycle. Common problems associated with oral cavity. Cleansing and care needs for face, eye lids, lips, hands, feet, nail, scalp, neck, body and under-arm. | 12
Hrs |
| 3 | Formulation Building blocks: Building blocks for different product formulations of cosmetics/cosmeceuticals. Surfactants – Classification and application. Emollients, rheological additives: classification and application. Antimicrobial used as preservatives, their merits and demerits. Factors affecting microbial preservative efficacy. Building blocks for formulation of a moisturizing cream, vanishing cream, cold cream, shampoo and toothpaste. Soaps and syndetbars. Perfumes; Classification of perfumes. Perfume ingredients listed as allergens in EU regulation. | 12
Hrs |

Controversial ingredients: Parabens, formaldehyde liberators, dioxane.

- | | | |
|---|---|-----------|
| 4 | Design of cosmeceutical products: Sun protection, sunscreens classification and regulatory aspects. Addressing dry skin, acne, sun-protection, pigmentation, prickly heat, wrinkles, body odor., dandruff, dental cavities, bleeding gums, mouth odor and sensitive teeth through cosmeceutical formulations. | 12
Hrs |
| 5 | Herbal Cosmetics : Herbal ingredients used in Hair care, skin care and oral care. Review of guidelines for herbal cosmetics by private bodies like cosmos with respect to preservatives, emollients, foaming agents, emulsifiers and rheology modifiers. Challenges in formulating herbal cosmetics. | 12
Hrs |

REFERENCES

1. Harry's Cosmeticology. 8th edition.
2. Poucher's perfume cosmetics and Soaps, 10th edition.
3. Cosmetics - Formulation, Manufacture and quality control, P.P. Sharma, 4th edition
4. Handbook of cosmetic science and Technology A.O. Barel, M. Paye and H.I. Maibach. 3rd edition
5. Cosmetic and Toiletries recent suppliers catalogue.
6. CTFA directory.

PHARMACEUTICS PRACTICALS - II
(MPH 205P)

1. To study the effect of temperature change , non solvent addition, incompatible polymer addition in microcapsules preparation
2. Preparation and evaluation of Alginate beads
3. Formulation and evaluation of gelatin /albumin microspheres
4. Formulation and evaluation of liposomes/niosomes
5. Formulation and evaluation of spherules
6. Improvement of dissolution characteristics of slightly soluble drug by Solid dispersion technique.
7. Comparison of dissolution of two different marketed products /brands
8. Protein binding studies of a highly protein bound drug & poorly protein bound drug
9. Bioavailability studies of Paracetamol in animals.
10. Pharmacokinetic and IVIVC data analysis by Winnoline^R software
11. In vitro cell studies for permeability and metabolism
12. DoE Using Design Expert[®] Software
13. Formulation data analysis Using Design Expert[®] Software
14. Quality-by-Design in Pharmaceutical Development
15. Computer Simulations in Pharmacokinetics and Pharmacodynamics
16. Computational Modeling Of Drug Disposition
17. To develop Clinical Data Collection manual
18. To carry out Sensitivity Analysis, and Population Modeling.
19. Development and evaluation of Creams
20. Development and evaluation of Shampoo and Toothpaste base
21. To incorporate herbal and chemical actives to develop products
22. To address Dry skin, acne, blemish, Wrinkles, bleeding gums and dandruff

PHARMACEUTICAL QUALITY ASSURANCE (MQA)

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (MQA 101T)

Scope

This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.

Objectives

After completion of course student is able to know about chemicals and excipients

- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instruments

THEORY

- | | | |
|----|---|--------|
| | | 60 Hrs |
| 1. | a. UV-Visible spectroscopy: Introduction, Theory, Laws, Instrumentation associated with UV-Visible spectroscopy, Choice of solvents and solvent effect and Applications of UV-Visible spectroscopy, Difference/ Derivative spectroscopy. | 12 Hrs |
| | b. IR spectroscopy: Theory, Modes of Molecular vibrations, Sample handling, Instrumentation of Dispersive and Fourier - Transform IR Spectrometer, Factors affecting vibrational frequencies and Applications of IR spectroscopy, Data Interpretation. | |
| | c. Spectrofluorimetry: Theory of Fluorescence, Factors affecting fluorescence (Characteristics of drugs that can be analysed by fluorimetry), Quenchers, Instrumentation and Applications of fluorescence spectrophotometer. | |
| | d. Flame emission spectroscopy and Atomic absorption spectroscopy: Principle, Instrumentation, Interferences and Applications. | |
| 2 | NMR spectroscopy: Quantum numbers and their role in NMR, Principle, Instrumentation, Solvent requirement in NMR, Relaxation process, NMR signals in various compounds, Chemical shift, Factors influencing chemical shift, Spin-Spin coupling, Coupling constant, Nuclear magnetic double resonance, Brief outline of principles of FT-NMR and ¹³ C NMR. Applications of NMR spectroscopy. | 12 Hrs |

- 3 Mass Spectroscopy: Principle, Theory, Instrumentation of Mass Spectroscopy, Different types of ionization like electron impact, chemical, field, FAB and MALDI, APCI, ESI, APPI Analyzers of Quadrupole and Time of Flight, Mass fragmentation and its rules, Meta stable ions, Isotopic peaks and Applications of Mass spectroscopy. 12 Hrs
- 4 Chromatography: Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution, isolation of drug from excipients, data interpretation and applications of the following: 12 Hrs
- Thin Layer chromatography
 - High Performance Thin Layer Chromatography
 - Ion exchange chromatography
 - Column chromatography
 - Gas chromatography
 - High Performance Liquid chromatography
 - Ultra High Performance Liquid chromatography
 - Affinity chromatography
 - Gel Chromatography
- 5 a. Electrophoresis: Principle, Instrumentation, Working conditions, factors affecting separation and applications of the following: 12 Hrs
- a) Paper electrophoresis b) Gel electrophoresis c) Capillary electrophoresis d) Zone electrophoresis e) Moving boundary electrophoresis f) Iso electric focusing
- b. X ray Crystallography: Production of X rays, Different X ray methods, Bragg's law, Rotating crystal technique, X ray powder technique, Types of crystals and applications of X-ray diffraction.
- 6 a. Potentiometry: Principle, working, Ion selective Electrodes and Application of potentiometry. 12 Hrs
- b. Thermal Techniques: Principle, thermal transitions and Instrumentation (Heat flux and power-compensation and designs), Modulated DSC, Hyper DSC, experimental parameters (sample preparation, experimental conditions, calibration, heating and cooling rates, resolution, source of errors) and their influence, advantage and disadvantages, pharmaceutical applications. Differential Thermal Analysis (DTA): Principle, instrumentation

and advantage and disadvantages, pharmaceutical applications, derivative differential thermal analysis (DDTA). TGA: Principle, instrumentation, factors affecting results, advantage and disadvantages, pharmaceutical applications.

REFERENCES

1. Spectrometric Identification of Organic compounds - Robert M Silverstein, Sixth edition, John Wiley & Sons, 2004.
2. Principles of Instrumental Analysis - Douglas A Skoog, F. James Holler, Timothy A. Nieman, 5th edition, Eastern press, Bangalore, 1998.
3. Instrumental methods of analysis - Willards, 7th edition, CBS publishers.
4. Practical Pharmaceutical Chemistry - Beckett and Stenlake, Vol II, 4th edition, CBS Publishers, New Delhi, 1997.
5. Organic Spectroscopy - William Kemp, 3rd edition, ELBS, 1991.
6. Quantitative Analysis of Drugs in Pharmaceutical formulation - P D Sethi, 3rd Edition, CBS Publishers, New Delhi, 1997.
7. Pharmaceutical Analysis - Modern Methods - Part B - J W Munson, Vol 11, Marcel. Dekker Series
8. Spectroscopy of Organic Compounds, 2nd edn., P.S/Kalsi, Wiley estern Ltd., Delhi.
9. Textbook of Pharmaceutical Analysis, KA.Connors, 3rd Edition, John Wiley & Sons, 1982.
10. Textbook of Pharmaceutical Analysis, KA.Connors, 3rd Edition, John Wiley & Sons, 1982.

QUALITY MANAGEMENT SYSTEMS (MQA 102T)

Scope

This course is designed to impart fundamental knowledge and concepts about various quality management principles and systems utilized in the manufacturing industry. It also aids in understanding the quality evaluation in the pharmaceutical industries.

Objectives

At completion of this course it is expected that students will be able to understand-

- The importance of quality
- ISO management systems
- Tools for quality improvement
- Analysis of issues in quality
- Quality evaluation of pharmaceuticals
- Stability testing of drug and drug substances
- Statistical approaches for quality

THEORY

60 Hrs

1. Introduction to Quality: Evolution of Quality, Definition of Quality, Dimensions of Quality 12 Hrs
Quality as a Strategic Decision: Meaning of strategy and strategic quality management, mission and vision statements, quality policy, Quality objectives, strategic planning and implementation, McKinsey 7s model, Competitive analysis, Management commitment to quality
Customer Focus: Meaning of customer and customer focus, Classification of customers, Customer focus, Customer perception of quality, Factors affecting customer perception, Customer requirements, Meeting customer needs and expectations, Customer satisfaction and Customer delight, Handling customer complaints, Understanding customer behavior, concept of internal and external customers. Case studies.
Cost of Quality: Cost of quality, Categories of cost of Quality, Models of cost of quality, Optimising costs, Preventing cost of quality.

- | | | |
|---|--|-----------|
| 2 | Pharmaceutical quality Management: Basics of Quality Management, Total Quality Management (TQM), Principles of Six sigma, ISO 9001:2008, 9001:2015, ISO 14001:2004, Pharmaceutical Quality Management – ICH Q10, Knowledge management, Quality Metrics, Operational Excellence and Quality Management Review. OSHAS guidelines, NABL certification and accreditation, CFR-21 part 11, WHO-GMP requirements. | 12
Hrs |
| 3 | Six System Inspection model: Quality Management system, Production system, Facility and Equipment system, Laboratory control system, Materials system, Packaging and labeling system. Concept of self inspection.
Quality systems: Change Management/ Change control. Deviations, Out of Specifications (OOS), Out of Trend (OOT), Complaints - evaluation and handling, Investigation and determination of root cause, Corrective & Preventive Actions (CAPA), Returns and Recalls, Vendor Qualification, Annual Product Reviews, Batch Review and Batch Release. Concept of IPQC, area clearance/ Line clearance. | 12
Hrs |
| 4 | Drug Stability: ICH guidelines for stability testing of drug substances and drug products.
Study of ICH Q8, Quality by Design and Process development report
Quality risk management: Introduction, risk assessment, risk control, risk review, risk management tools, HACCP, risk ranking and filtering according to ICH Q9 guidelines. | 12
Hrs |
| 5 | Statistical Process control (SPC): Definition and Importance of SPC, Quality measurement in manufacturing, Statistical control charts - concepts and general aspects, Advantages of statistical control, Process capability, Estimating Inherent or potential capability from a control chart analysis, Measuring process control and quality improvement, Pursuit of decreased process variability. | 8 Hrs |
| 6 | Regulatory Compliance through Quality Management and development of Quality Culture
Benchmarking: Definition of benchmarking, Reasons for benchmarking, Types of Benchmarking, Benchmarking process, Advantages of benchmarking, Limitations of benchmarking. | 4 Hrs |

REFERENCES

1. Implementing Juran's Road Map for Quality Leadership: Benchmarks and Results, By Al Endres, Wiley, 2000
2. Understanding, Managing and Implementing Quality: Frameworks, Techniques and Cases, By Jiju Antony; David Preece, Routledge, 2002
3. Organizing for High Performance: Employee Involvement, TQM, Reengineering, and Knowledge Management in the Fortune 1000: The CEO Report By Edward E. Lawler; Susan Albers Mohrman; George Benson, Jossey-Bass, 2001
4. Corporate Culture and the Quality Organization By James W. Fairfield-Sonn, Quorum Books, 2001
5. The Quality Management Sourcebook: An International Guide to Materials and Resources By Christine Avery; Diane Zabel, Routledge, 1997
6. The Quality Toolbox, Second Edition, Nancy R. Tague, ASQ Publications
7. Juran's Quality Handbook, Sixth Edition, Joseph M. Juran and Joseph A. De Feo, ASQ Publications
8. Root Cause Analysis, The Core of Problem Solving and Corrective Action, Duke Okes, 2009, ASQ Publications.

QUALITY CONTROL AND QUALITY ASSURANCE (MQA 103T)

Scope

This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It covers the important aspects like cGMP, QC tests, documentation, quality certifications, GLP and regulatory affairs.

Objectives

Upon completion of this course the student should be able to

- Understand the cGMP aspects in a pharmaceutical industry
- To appreciate the importance of documentation
- To understand the scope of quality certifications applicable to Pharmaceutical industries
- To understand the responsibilities of QA & QC departments.

THEORY

60 Hrs

1. Introduction: Concept and evolution and scopes of Quality Control and Quality Assurance, Good Laboratory Practice, GMP, Overview of ICH Guidelines - QSEM, with special emphasis on Q-series guidelines.
Good Laboratory Practices: Scope of GLP, Definitions, Quality assurance unit, protocol for conduct of non clinical testing, control on animal house, report preparation and documentation. CPCSEA guidelines. 12 Hrs

2. cGMP guidelines according to schedule M, USFDA (inclusive of CDER and CBER) Pharmaceutical Inspection Convention(PIC), WHO and EMEA covering: Organization and personnel responsibilities, training, hygiene and personal records, drug industry location, design, construction and plant lay out, maintenance, sanitation, environmental control, utilities and maintenance of sterile areas, control of contamination and Good Warehousing Practice. 12 Hrs

3. Analysis of raw materials, finished products, packaging materials, in process quality control (IPQC), Developing specification (ICH Q6 and Q3), purchase specifications and maintenance of stores for raw materials. 12 Hrs

In process quality control and finished products quality control for following dosage forms in Pharma industry according to Indian, US and British pharmacopoeias: tablets, capsules, ointments, suppositories, creams, parenterals, ophthalmic and surgical products (How to refer pharmacopoeias).

- 4 Documentation in pharmaceutical industry: Three tier documentation, Policy, Procedures and Work instructions, and records (Formats), Basic principles- How to maintain, retention and retrieval etc. Standard operating procedures (How to write), Master Batch Record, Batch Manufacturing Record, Quality audit plan and reports. Specification and test procedures, Protocols and reports. Distribution records. Electronic data handling. Concepts of controlled and uncontrolled documents. Submission documents for regulators DMFs, as Common Technical Document and Electronic Common Technical Documentation (CTD, eCTD). Concept of regulated and non regulated markets. 12 Hrs
- 5 Manufacturing operations and controls: Sanitation of manufacturing premises, mix-ups and cross contamination, processing of intermediates and bulk products, packaging operations, IPQC, release of finished product, process deviations, charge-in of components, time limitations on production, drug product inspection, expiry date calculation, calculation of yields, production record review, change control, sterile products, aseptic process control, packaging, reprocessing, salvaging, handling of waste and scrap disposal. 12 Hrs
- Introduction, scope and importance of intellectual property rights. Concept of trade mark, copyright and patents.

REFERENCES

1. Quality Assurance Guide by organization of Pharmaceutical Procedures of India, 3rd revised edition, Volume I & II, Mumbai, 1996.
2. Good Laboratory Practice Regulations, 2nd Edition, Sandy Weinberg Vol. 69, Marcel Dekker Series, 1995.
3. Quality Assurance of Pharmaceuticals- A compedium of Guide lines and Related materials Vol I & II, 2nd edition, WHO Publications, 1999.
4. How to Practice GMP's - P P Sharma, Vandana Publications, Agra, 1991.

5. The International Pharmacopoeia – vol I, II, III, IV & V - General Methods of Analysis and Quality specification for Pharmaceutical Substances, Excipients and Dosage forms, 3rd edition, WHO, Geneva, 2005.
6. Good laboratory Practice Regulations – Allen F. Hirsch, Volume 38, Marcel Dekker Series, 1989.
7. ICH guidelines
8. ISO 9000 and total quality management
9. The drugs and cosmetics act 1940 – Deshpande, Nilesh Gandhi, 4th edition, Susmit Publishers, 2006.
10. QA Manual – D.H. Shah, 1st edition, Business Horizons, 2000.
11. Good Manufacturing Practices for Pharmaceuticals a plan for total quality control – Sidney H. Willig, Vol. 52, 3rd edition, Marcel Dekker Series.
12. Steinborn L. GMP/ISO Quality Audit Manual for Healthcare Manufacturers and Their Suppliers, Sixth Edition, (Volume 1 - With Checklists and Software Package). Taylor & Francis; 2003.
13. Sarker DK. Quality Systems and Controls for Pharmaceuticals. John Wiley & Sons; 2008.
14. Packaging of Pharmaceuticals.
15. Schedule M and Schedule N.

PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER (MQA 104T)

Scope

This deal with technology transfer covers the activities associated with Drug Substance, Drug Product and analytical tests and methods, required following candidate drug selection to completion of technology transfer from R&D to the first receiving site and technology transfer related to post-marketing changes in manufacturing places.

Objectives

Upon completion of this course the student should be able to

- To understand the new product development process
- To understand the necessary information to transfer technology from R&D to actual manufacturing by sorting out various information obtained during R&D
- To elucidate necessary information to transfer technology of existing products between various manufacturing places

THEORY

60 Hrs

1. Principles of Drug discovery and development: Introduction, Clinical research process. Development and informational content for Investigational New Drugs Application (IND), New Drug Application (NDA), Abbreviated New Drug Application (ANDA), Supplemental New Drug Application (SNDA), Scale Up Post Approval Changes (SUPAC) and Bulk active chemical Post approval changes (BACPAC), Post marketing surveillance, Product registration guidelines – CDSCO, USFDA. 12 Hrs
2. Pre-formulation studies: Introduction/concept, organoleptic properties, purity, impurity profiles, particle size, shape and surface area. Solubility, Methods to improve solubility of Drugs: Surfactants & its importance, co-solvency. Techniques for the study of Crystal properties and polymorphism. Pre-formulation protocol, Stability testing during product development. 12 Hrs
3. Pilot plant scale up: Concept, Significance, design, layout of pilot plant scale up study, operations, large scale manufacturing techniques (formula, equipment, process, stability and quality control) of solids, liquids, semisolid and parenteral dosage forms. New era of drug products: opportunities and challenges. 12 Hrs

- 4 Pharmaceutical packaging: Pharmaceutical dosage form and their packaging requirements, Pharmaceutical packaging materials, Medical device packaging, Enteral Packaging, Aseptic packaging systems, Container closure systems, Issues facing modern drug packaging, Selection and evaluation of Pharmaceutical packaging materials. 12 Hrs
Quality control test: Containers, closures and secondary packing materials.
- 5 Technology transfer: Development of technology by R & D, Technology transfer from R & D to production, Optimization and Production, Qualitative and quantitative technology models. 12 Hrs
Documentation in technology transfer: Development report, technology transfer plan and Exhibit.

REFERENCES

1. The process of new drug discovery and development. I and II Edition (2006) by Charles G. Smith, James T and O. Donnell. CRC Press, Group of Taylor and Francis.
2. Leon Lac Lachman, Herbert A. Liberman, Theory and Practice of Industrial Pharmacy. Marcel Dekker Inc. New York.
3. Sidney H Willing, Murray M, Tuckerman. Williams Hitchings IV, Good manufacturing of pharmaceuticals (A Plan for total quality control) 3rd Edition. Bhalani publishing house Mumbai.
4. Tablets Vol. I, II, III by Leon Lachman, Herbert A. Liberman, Joseph B. Schwartz, 2nd Edn. (1989) Marcel Dekker Inc. New York.
5. Text book of Bio- Pharmaceutics and clinical Pharmacokinetics by Milo Gibaldi, 3rd Edn, Lea & Febriger, Philadelphia.
6. Pharmaceutical product development. Vandana V. Patrevala. John I. Disouza. Maharukh T.Rustomji. CRC Press, Group of Taylor and Francis.
7. Dissolution, Bioavailability and Bio-Equivalence by Abdou H.M, Mack Publishing company, Eastern Pennsylvania.
8. Remingtons Pharmaceutical Sciences, by Alfonso & Gennaro, 19th Edn.(1995)O2C Lippincott; Williams and Wilkins A Wolters Kluwer Company, Philadelphia.
9. The Pharmaceutical Sciences; the Pharma Path way 'Pure and applied Pharmacy' by D. A Sawant, Pragathi Books Pvt. Ltd.
10. Pharmaceutical Packaging technology by D.A. Dean. E.R. Evans, I.H. Hall. 1st Edition(Reprint 2006). Taylor and Francis. London and New York.

QUALITY ASSURANCE PRACTICAL - I
(MQA 105P)

PRACTICALS

1. Analysis of Pharmacopoeial compounds in bulk and in their formulations (tablet/ capsules/ semisolids) by UV Vis spectrophotometer
2. Simultaneous estimation of multi-drug component containing formulations by UV spectrophotometry
3. Experiments based on HPLC
4. Experiments based on Gas Chromatography
5. Estimation of riboflavin/quinine sulphate by fluorimetry
6. Estimation of sodium/potassium by flame photometry or AAS
7. Case studies on
 - Total Quality Management
 - Six Sigma
 - Change Management/ Change control. Deviations,
 - Out of Specifications (OOS)
 - Out of Trend (OOT)
 - Corrective & Preventive Actions (CAPA)
 - Deviations
8. Development of Stability study protocol
9. Estimation of process capability
10. In process and finished product quality control tests for tablets, capsules, parenterals and semisolid dosage forms.
11. Assay of raw materials as per official monographs
12. Testing of related and foreign substances in drugs and raw materials
13. To carry out pre formulation study for tablets, parenterals (2 experiment).
14. To study the effect of pH on the solubility of drugs, (1 experiment)
15. Quality control tests for Primary and secondary packaging materials
16. Accelerated stability studies (1 experiment)
17. Improved solubility of drugs using surfactant systems (1 experiment)
18. Improved solubility of drugs using co-solvency method (1 experiment)
19. Determination of Pka and Log p of drugs.

HAZARDS AND SAFETY MANAGEMENT (MQA 201T)

Scope

This course is designed to convey the knowledge necessary to understand issues related to different kinds of hazard and their management. Basic theoretical and practical discussions integrate the proficiency to handle the emergency situation in the pharmaceutical product development process and provides the principle based approach to solve the complex tribulations.

Objectives

At completion of this course it is expected that students will be able to

- Understand about environmental problems among learners.
- Impart basic knowledge about the environment and its allied problems.
- Develop an attitude of concern for the industry environment.
- Ensure safety standards in pharmaceutical industry
- Provide comprehensive knowledge on the safety management
- Empower an ideas to clear mechanism and management in different kinds of hazard management system
- Teach the method of Hazard assessment, procedure, methodology for provide safe industrial atmosphere.

THEORY

60Hrs

- | | | |
|----|---|-----------|
| 1. | Multidisciplinary nature of environmental studies: Natural Resources, Renewable and non-renewable resources, Natural resources and associated problems,
a) Forest resources; b) Water resources; c) Mineral resources; d) Energy resources; e) Land resources
Ecosystems: Concept of an ecosystem and Structure and function of an ecosystem. Environmental hazards: Hazards based on Air, Water, Soil and Radioisotopes. | 12
Hrs |
| 2 | Air based hazards: Sources, Types of Hazards, Air circulation maintenance industry for sterile area and non sterile area, Preliminary Hazard Analysis (PHA) Fire protection system: Fire prevention, types of fire extinguishers and critical Hazard management system. | 12
Hrs |
| 3 | Chemical based hazards: Sources of chemical hazards, Hazards of Organic synthesis, sulphonating hazard, Organic solvent hazard, Control measures for chemical hazards, | 12
Hrs |

Management of combustible gases, Toxic gases and Oxygen displacing gases management, Regulations for chemical hazard, Management of over-Exposure to chemicals and TLV concept.

- 4 Fire and Explosion: Introduction, Industrial processes and hazards potential, mechanical electrical, thermal and process hazards. Safety and hazards regulations, Fire protection system: Fire prevention, types of fire extinguishers and critical Hazard management system mechanical and chemical explosion, multiphase reactions, transport effects and global rates. Preventive and protective management from fires and explosion-electricity passivation, ventilation, and sprinkling, proofing, relief systems -relief valves, flares, scrubbers. 12 Hrs
- 5 Hazard and risk management: Self-protective measures against workplace hazards. Critical training for risk management, Process of hazard management, ICH guidelines on risk assessment and Risk management methods and Tools 12 Hrs
Factory act and rules, fundamentals of accident prevention, elements of safety programme and safety management, Physicochemical measurements of effluents, BOD, COD, Determination of some contaminants, Effluent treatment procedure, Role of emergency services.

REFERENCES

1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore
2. "Quantitative Risk Assessment in Chemical Process Industries" American Institute of Chemical Industries, Centre for Chemical Process safety.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India,
4. Hazardous Chemicals: Safety Management and Global Regulations, T.S.S. Dikshith, CRC press

PHARMACEUTICAL VALIDATION (MQA 202T)

Scope

The main purpose of the subject is to understand about validation and how it can be applied to industry and thus improve the quality of the products. The subject covers the complete information about validation, types, methodology and application.

Objectives

At completion of this course, it is expected that students will be able to understand

- The concepts of calibration, qualification and validation
- The qualification of various equipments and instruments
- Process validation of different dosage forms
- Validation of analytical method for estimation of drugs
- Cleaning validation of equipments employed in the manufacture of pharmaceuticals

THEORY

60 Hrs

- | | | |
|----|--|-----------|
| 1. | Introduction to validation: Definition of Calibration, Qualification and Validation, Scope, frequency and importance. Difference between calibration and validation. Calibration of weights and measures. Advantages of Validation, scope of Validation, Organization for Validation, Validation Master plan, Types of Validation, Streamlining of qualification & Validation process and Validation Master Plan.
Qualification: User requirement specification, Design qualification, Factory Acceptance Test (FAT)/Site Acceptance Test (SAT), Installation qualification, Operational qualification, Performance qualification, Re-Qualification (Maintaining status-Calibration Preventive Maintenance, Change management). | 10
Hrs |
| 2 | Qualification of manufacturing equipment: Dry Powder Mixers, Fluid Bed and Tray dryers, Tablet Compression (Machine), Dry heat sterilization/Tunnels, Autoclaves, Membrane filtration, Capsule filling machine.
Qualification of analytical instruments: UV-Visible spectrophotometer, FTIR, DSC, GC, HPLC, HPTLC, LC-MS. | 10
Hrs |

- 3 Qualification of laboratory equipments: Hardness tester, Friability test apparatus, tap density tester, Disintegration tester, Dissolution test apparatus
Validation of Utility systems: Pharmaceutical water system & pure steam, HVAC system, Compressed air and nitrogen. 10 Hrs
- 4 Process Validation: Concept, Process and documentation of Process Validation. Prospective, Concurrent & Retrospective Validation, Re validation criteria, Process Validation of various formulations (Coated tablets, Capsules, Ointment/Creams, Liquid Orals and aerosols.), Aseptic filling: Media fill validation, USFDA guidelines on Process Validation- A life cycle approach.
Analytical method validation: General principles, Validation of analytical method as per ICH guidelines and USP. 10 Hrs
- 5 Cleaning Validation: Cleaning Method development, Validation of analytical method used in cleaning, Cleaning of Equipment, Cleaning of Facilities. Cleaning in place (CIP).
Validation of facilities in sterile and non-sterile plant.
Computerized system validation: Electronic records and digital signature - 21 CFR Part 11 and GAMP 10 Hrs
- 6 General Principles of Intellectual Property: Concepts of Intellectual Property (IP), Intellectual Property Protection (IPP), Intellectual Property Rights (IPR); Economic importance, mechanism for protection of Intellectual Property –patents, Copyright, Trademark; Factors affecting choice of IP protection; Penalties for violation; Role of IP in pharmaceutical industry; Global ramification and financial implications. Filing a patent applications; patent application forms and guidelines. Types patent applications-provisional and non provisional, PCT and convention patent applications; International patenting requirement procedures and costs; Rights and responsibilities of a patentee; Practical aspects regarding maintaining of a Patent file; Patent infringement meaning and scope. Significance of transfer technology (TOT), IP and ethics-positive and negative aspects of IPP; Societal responsibility, avoiding unethical practices. 10 Hrs

REFERENCES

1. B. T. Loftus & R. A. Nash, "Pharmaceutical Process Validation", Drugs and Pharm Sci. Series, Vol. 129, 3rd Ed., Marcel Dekker Inc., N.Y.
2. The Theory & Practice of Industrial Pharmacy, 3rd edition, Leon Lachman, Herbert A. Lieberman, Joseph. L. Karig, Varghese Publishing House, Bombay.
3. Validation Master plan by Terveeks or Deeks, Davis Harwood International publishing.
4. Validation of Aseptic Pharmaceutical Processes, 2nd Edition, by Carleton & Agalloco,
5. (Marcel Dekker).
6. Michael Levin, Pharmaceutical Process Scale-Up", Drugs and Pharm. Sci. Series, Vol. 157, 2nd Ed., Marcel Dekker Inc., N.Y.
7. Validation Standard Operating Procedures: A Step by Step Guide for Achieving Compliance in the Pharmaceutical, Medical Device, and Biotech Industries, Syed Imtiaz Haider
8. Pharmaceutical Equipment Validation: The Ultimate Qualification Handbook, Phillip A. Cloud, Interpharm Press
9. Validation of Pharmaceutical Processes: Sterile Products, Frederick J. Carlton (Ed.) and James Agalloco (Ed.), Marcel Dekker
10. Analytical Method validation and Instrument Performance Verification by Churg Chan, Heiman Lam, Y.C. Lee, Yue. Zhang, Wiley Interscience.
11. Huber L. Validation and Qualification in Analytical Laboratories. Informa Healthcare
12. Wingate G. Validating Corporate Computer Systems: Good IT Practice for Pharmaceutical Manufacturers. Interpharm Press
13. LeBlanc DA. Validated Cleaning Technologies for Pharmaceutical Manufacturing. Interpharm Press

AUDITS AND REGULATORY COMPLIANCE (MPA 203T)

Scope

This course deals with the understanding and process for auditing in pharmaceutical industries. This subject covers the methodology involved in the auditing process of different in pharmaceutical industries.

Objectives

Upon completion of this course the student should be able to

- To understand the importance of auditing
- To understand the methodology of auditing
- To carry out the audit process
- To prepare the auditing report
- To prepare the check list for auditing

THEORY

60 Hrs

- | | | |
|----|---|-----------|
| 1. | Introduction: Objectives, Management of audit, Responsibilities, Planning process, information gathering, administration, Classifications of deficiencies | 12
Hrs |
| 2 | Role of quality systems and audits in pharmaceutical manufacturing environment: cGMP Regulations, Quality assurance functions, Quality systems approach, Management responsibilities, Resource, Manufacturing operations, Evaluation activities, Transitioning to quality system approach, Audit checklist for drug industries. | 12
Hrs |
| 3 | Auditing of vendors and production department: Bulk Pharmaceutical Chemicals and packaging material Vendor audit, Warehouse and weighing, Dry Production: Granulation, tableting, coating, capsules, sterile production and packaging. | 12
Hrs |
| 4 | Auditing of Microbiological laboratory: Auditing the manufacturing process, Product and process information, General areas of interest in the building raw materials, Water, Packaging materials. | 12
Hrs |

- 5 Auditing of Quality Assurance and engineering department: 12
Quality Assurance Maintenance, Critical systems: HVAC, Water, Hrs
Water for Injection systems, ETP.

REFERENCES

1. Compliance auditing for Pharmaceutical Manufacturers. Karen Ginsbury and Gil Bismuth, Interpharm/CRC, Boca Raton, London New York, Washington D.C.
2. Pharmaceutical Manufacturing Handbook, Regulations and Quality by Shayne Cox Gad. Wiley-Interscience, A John Wiley and sons, Inc., Publications.
3. Handbook of microbiological Quality control. Rosamund M. Baird, Norman A. Hodges, Stephen P. Denyar. CRC Press. 2000.
4. Laboratory auditing for quality and regulatory compliance. Donald C. Singer, Raluca-loana Stefan, Jacobus F. Van Staden. Taylor and Francis (2005).

PHARMACEUTICAL MANUFACTURING TECHNOLOGY (MQA 204T)

Scope

This course is designed to impart knowledge and skills necessary to train the students with the industrial activities during Pharmaceutical Manufacturing.

Objectives

At completion of this course it is expected that students will be able to understand,

- The common practice in the pharmaceutical industry developments, plant layout and production planning
- Will be familiar with the principles and practices of aseptic process technology, non sterile manufacturing technology and packaging technology.
- Have a better understanding of principles and implementation of Quality by design (QbD) and process analytical technology (PAT) in pharmaceutical manufacturing

THEORY

60 Hrs

1. Pharmaceutical industry developments: Legal requirements and Licenses for API and formulation industry, Plant location-Factors influencing. 12 Hrs
Plant layout: Factors influencing, Special provisions, Storage space requirements, sterile and aseptic area layout.
Production planning: General principles, production systems, calculation of standard cost, process planning, routing, loading, scheduling, dispatching of records, production control.
- 2 Aseptic process technology: Manufacturing, manufacturing flowcharts, in process-quality control tests for following sterile dosage forms: Ointment, Suspension and Emulsion, Dry powder, Solution (Small Volume & large Volume). 12 Hrs
Advanced sterile product manufacturing technology : Area planning & environmental control, wall and floor treatment, fixtures and machineries, change rooms, personnel flow, utilities & utilities equipment location, engineering and maintenance.
Process Automation in Pharmaceutical Industry: With specific reference to manufacturing of sterile semisolids, Small Volume Parenterals & Large Volume Parenterals (SVP & LVP), Monitoring of Parenteral manufacturing facility, Cleaning in Place (CIP),

Sterilization in Place (SIP), Prefilled Syringe, Powdered Jet, Needle Free Injections, and Form Fill Seal Technology (FFS).
Lyophilization technology: Principles, process, equipment.

- 3 Non sterile manufacturing process technology: 12 Hrs
Manufacturing, manufacturing flowcharts, in process-quality control tests for following Non-Sterile solid dosage forms: Tablets (compressed & coated), Capsules (Hard & Soft).
Advance non-sterile solid product manufacturing technology: Process Automation in Pharmaceutical Industry with specific reference to manufacturing of tablets and coated products, Improved Tablet Production: Tablet production process, granulation and pelletization equipments, continuous and batch mixing, rapid mixing granulators, rota granulators, spheronizers and marumerisers, and other specialized granulation and drying equipments. Problems encountered.
Coating technology: Process, equipments, particle coating, fluidized bed coating, application techniques. Problems encountered.
- 4 Containers and closures for pharmaceuticals: Types, 12 Hrs
performance, assuring quality of glass; types of plastics used, Drug plastic interactions, biological tests, modification of plastics by drugs; different types of closures and closure liners; film wrapper; blister packs; bubble packs; shrink packaging; foil / plastic pouches, bottle seals, tape seals, breakable seals and sealed tubes; quality control of packaging material and filling equipment, flexible packaging, product package compatibility, transit worthiness of package, Stability aspects of packaging. Evaluation of stability of packaging material.
- 5 Quality by design (QbD) and process analytical technology 12 Hrs
(PAT): Current approach and its limitations. Why QbD is required, Advantages, Elements of QbD, Terminology: QTPP. CMA, CQA, CPP, RLD, Design space, Design of Experiments, Risk Assessment and mitigation/minimization. Quality by Design, Formulations by Design, QbD for drug products, QbD for Drug Substances, QbD for Excipients, Analytical QbD. FDA initiative on process analytical technology. PAT as a driver for improving quality and reducing costs: quality by design (QbD), QA, QC and GAMP. PAT guidance, standards and regulatory requirements.

REFERENCES

1. Lachman L, Lieberman HA, Kanig J L. The theory and practice of industrial pharmacy, 3rd ed., Varghese Publishers, Mumbai 1991.
2. Sinko P J. Martin's physical pharmacy and pharmaceutical sciences, 5th ed., B.I. Publications Pvt. Ltd, Noida, 2006.
3. Lieberman HA, Lachman L, Schwartz J B. Pharmaceutical dosage forms: tablets Vol. I-III, 2nd ed., CBS Publishers & distributors, New Delhi, 2005.
4. Banker GS, Rhodes CT. Modern Pharmaceutics, 4th ed., Marcel Dekker Inc, New York, 2005.
5. Sidney H Willing, Murray M, Tuckerman. Williams Hitchings IV, Good manufacturing of pharmaceuticals (A Plan for total quality control) 3rd Edition. Bhalani publishing house Mumbai.
6. Indian Pharmacopoeia. Controller of Publication. Delhi, 1996.
7. British Pharmacopoeia. British Pharmacopoeia Commission Office, London, 2008.
8. United States Pharmacopoeia. United States Pharmacopoeial Convention, Inc, USA, 2003.
9. Dean D A, Evans E R and Hall I H. Pharmaceutical Packaging Technology. London, Taylor & Francis, 1st Edition. UK.
10. Edward J Bauer. Pharmaceutical Packaging Handbook. 2009. Informa Health care USA Inc. New york.
11. Shaybe Cox Gad. Pharmaceutical Manufacturing Handbook. John Willey and Sons, New Jersey, 2008.

QUALITY ASSURANCE PRACTICAL – II PRACTICALS
(MQA 205P)

1. Organic contaminants residue analysis by HPLC
2. Estimation of Metallic contaminants by Flame photometer
3. Identification of antibiotic residue by TLC
4. Estimation of Hydrogen Sulphide in Air.
5. Estimation of Chlorine in Work Environment.
6. Sampling and analysis of SO₂ using Colorimetric method
7. Qualification of following Pharma equipment
 - a. Autoclave
 - b. Hot air oven
 - c. Powder Mixer (Dry)
 - d. Tablet Compression Machine
8. Validation of an analytical method for a drug
9. Validation of a processing area
10. Qualification of at least two analytical instruments
11. Cleaning validation of one equipment
12. Qualification of Pharmaceutical Testing Equipment (Dissolution testing apparatus, Friability Apparatus, Disintegration Tester)
13. Check list for Bulk Pharmaceutical Chemicals vendors
14. Check list for tableting production.
15. Check list for sterile production area
16. Check list for Water for injection.
17. Design of plant layout: Sterile and non-sterile
18. Case study on application of QbD
19. Case study on application of PAT

PHARMACOLOGY (MPL)

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (MPL 101T)

Scope

This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.

Objectives

After completion of course student is able to know about,

- Chemicals and Excipients
- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instruments

THEORY

- | | |
|--|-----------|
| | 60 Hrs |
| 1. UV-Visible spectroscopy: Introduction, Theory, Laws, Instrumentation associated with UV-Visible spectroscopy, Choice of solvents and solvent effect and Applications of UV-Visible spectroscopy, Difference/ Derivative spectroscopy. IR spectroscopy: Theory, Modes of Molecular vibrations, Sample handling, Instrumentation of Dispersive and Fourier - Transform IR Spectrometer, Factors affecting vibrational frequencies and Applications of IR spectroscopy, Data Interpretation. Spectrofluorimetry: Theory of Fluorescence, Factors affecting fluorescence (Characteristics of drugs that can be analysed by fluorimetry), Quenchers, Instrumentation and Applications of fluorescence spectrophotometer. Flame emission spectroscopy and Atomic absorption spectroscopy: Principle, Instrumentation, Interferences and Applications. | 10
Hrs |
| 2. NMR spectroscopy: Quantum numbers and their role in NMR, Principle, Instrumentation, Solvent requirement in NMR, Relaxation process, NMR signals in various compounds, Chemical shift, Factors influencing chemical shift, Spin-Spin coupling, Coupling constant, Nuclear magnetic double resonance, Brief outline of principles of FT-NMR and ¹³ C NMR. Applications of NMR spectroscopy. | 10
Hrs |

- | | | |
|---|---|-----------|
| 3 | <p>Mass Spectroscopy: Principle, Theory, Instrumentation of Mass Spectroscopy, Different types of ionization like electron impact, chemical, field, FAB and MALDI, APCI, ESI, APPI Analyzers of Quadrupole and Time of Flight, Mass fragmentation and its rules, Meta stable ions, Isotopic peaks and Applications of Mass spectroscopy.</p> | 10
Hrs |
| 4 | <p>Chromatography: Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution, isolation of drug from excipients, data interpretation and applications of the following:</p> <ul style="list-style-type: none"> j) Thin Layer chromatography k) High Performance Thin Layer Chromatography l) Ion exchange chromatography m) Column chromatography n) Gas chromatography o) High Performance Liquid chromatography p) Ultra High Performance Liquid chromatography q) Affinity chromatography r) Gel Chromatography | 10
Hrs |
| 5 | <p>Electrophoresis: Principle, Instrumentation, Working conditions, factors affecting separation and applications of the following:</p> <ul style="list-style-type: none"> a) Paper electrophoresis b) Gel electrophoresis c) Capillary electrophoresis d) Zone electrophoresis e) Moving boundary electrophoresis f) Iso electric focusing <p>X ray Crystallography: Production of X rays, Different X ray methods, Bragg's law, Rotating crystal technique, X ray powder technique, Types of crystals and applications of X-ray diffraction.</p> | 10
Hrs |
| 6 | <p>Potentiometry: Principle, working, Ion selective Electrodes and Application of potentiometry.</p> <p>Thermal Techniques: Principle, thermal transitions and Instrumentation (Heat flux and power-compensation and designs), Modulated DSC, Hyper DSC, experimental parameters (sample preparation, experimental conditions, calibration, heating and cooling rates, resolution, source of errors) and their influence, advantage and disadvantages, pharmaceutical applications.</p> <p>Differential Thermal Analysis (DTA): Principle, instrumentation and advantage and disadvantages, pharmaceutical applications, derivative differential thermal analysis (DDTA). TGA: Principle, instrumentation, factors affecting results, advantage and disadvantages, pharmaceutical applications.</p> | 10
Hrs |

REFERENCES

1. Spectrometric Identification of Organic compounds - Robert M Silverstein, Sixth edition, John Wiley & Sons, 2004.
2. Principles of Instrumental Analysis - Douglas A Skoog, F. James Holler, Timothy A. Nieman, 5th edition, Eastern press, Bangalore, 1998.
3. Instrumental methods of analysis - Willards, 7th edition, CBS publishers.
4. Practical Pharmaceutical Chemistry - Beckett and Stenlake, Vol II, 4th edition, CBS Publishers, New Delhi, 1997.
5. Organic Spectroscopy - William Kemp, 3rd edition, ELBS, 1991.
6. Quantitative Analysis of Drugs in Pharmaceutical formulation - P D Sethi, 3rd Edition, CBS Publishers, New Delhi, 1997.
7. Pharmaceutical Analysis - Modern Methods - Part B - J W Munson, Vol 11, Marcel. Dekker Series
8. Spectroscopy of Organic Compounds, 2nd edn., P.S/Kalsi, Wiley estern Ltd., Delhi.
9. Textbook of Pharmaceutical Analysis, KA.Connors, 3rd Edition, John Wiley & Sons, 1982.

ADVANCED PHARMACOLOGY - I
(MPL 102T)

Scope

The subject is designed to strengthen the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. In addition, this subject helps the students to understand the concepts of drug action and mechanisms involved

Objectives

Upon completion of the course the student shall be able to :

- Discuss the pathophysiology and pharmacotherapy of certain diseases
- Explain the mechanism of drug actions at cellular and molecular level
- Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

THEORY

60 Hrs

- | | | |
|----|---|------------------------|
| 1. | General | Pharmacology 12
Hrs |
| | a. | |
| | Pharmacokinetics: The dynamics of drug absorption, distribution, biotransformation and elimination. Concepts of linear and non-linear compartment models. Significance of Protein binding. | |
| | b. | |
| | Pharmacodynamics: Mechanism of drug action and the relationship between drug concentration and effect. Receptors, structural and functional families of receptors, quantitation of drug receptors interaction and elicited effects. | |
| 2 | Neurotransmission | 12
Hrs |
| | a. | |
| | General aspects and steps involved in neurotransmission. | |
| | b. | |
| | Neurohumoral transmission in autonomic nervous system (Detailed study about neurotransmitters- Adrenaline and Acetyl choline). | |
| | c. | |
| | Neurohumoral transmission in central nervous system (Detailed study about neurotransmitters- histamine, serotonin, dopamine, GABA, glutamate and glycine). | |
| | d. | |
| | Non adrenergic non cholinergic transmission (NANC). Co-transmission | |

Systemic Pharmacology

A detailed study on pathophysiology of diseases, mechanism of action, pharmacology and toxicology of existing as well as novel drugs used in the following systems

Autonomic Pharmacology

Parasympathomimetics and lytics, sympathomimetics and lytics, agents affecting neuromuscular junction

- | | | |
|---|---|-----------|
| 3 | Central nervous system Pharmacology
General and local anesthetics
Sedatives and hypnotics, drugs used to treat anxiety.
Depression, psychosis, mania, epilepsy, neurodegenerative diseases.
Narcotic and non-narcotic analgesics. | 12
Hrs |
| 4 | Cardiovascular Pharmacology
Diuretics, antihypertensives, antiischemics, anti-arrhythmics, drugs for heart failure and hyperlipidemia.
Hematinics, coagulants, anticoagulants, fibrinolytics and anti-platelet drugs | 12
Hrs |
| 5 | Autocoid Pharmacology
The physiological and pathological role of Histamine, Serotonin, Kinins Prostaglandins Opioid autocoids.
Pharmacology of antihistamines, 5HT antagonists. | 12
Hrs |

REFEERENCES

1. The Pharmacological Basis of Therapeutics, Goodman and Gillman's
2. Principles of Pharmacology. The Pathophysiologic basis of drug Therapy by David E Golan, Armen H, Tashjian Jr, Ehrin J, Armstrong, April W, Armstrong, Wolters, Kluwer-Lippincott Williams & Wilkins Publishers.
3. Basic and Clinical Pharmacology by B.G Katzung
4. Hand book of Clinical Pharmacokinetics by Gibaldi and Prescott.
5. Applied biopharmaceutics and Pharmacokinetics by Leon Shargel and Andrew B.C.Yu.
6. Graham Smith. Oxford textbook of Clinical Pharmacology.
7. Avery Drug Treatment
8. Dipiro Pharmacology, Pathophysiological approach.
9. Green Pathophysiology for Pharmacists.

10. Robbins & Cortan Pathologic Basis of Disease, 9th Ed. (Robbins Pathology)
11. A Complete Textbook of Medical Pharmacology by Dr. S.K. Srivastava published by APC Avichal Publishing Company
12. K.D. Tripathi. Essentials of Medical Pharmacology.
13. Modern Pharmacology with Clinical Applications, Craig Charles R. & Stitzel Robert E., Lippincott Publishers.
14. Clinical Pharmacokinetics & Pharmacodynamics : Concepts and Applications – Malcolm Rowland and Thomas N. Tozer, Wolters Kluwer, Lippincott Williams & Wilkins Publishers.
15. Applied biopharmaceutics and Pharmacokinetics, Pharmacodynamics and Drug metabolism for industrial scientists.
16. Modern Pharmacology, Craig CR. & Stitzel RE, Little Brown & Company.

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING
METHODS - I
(MPL 103T)

Scope

This subject is designed to impart the knowledge on preclinical evaluation of drugs and recent experimental techniques in the drug discovery and development. The subject content helps the student to understand the maintenance of laboratory animals as per the guidelines, basic knowledge of various in-vitro and in-vivo preclinical evaluation processes

Objectives

Upon completion of the course the student shall be able to,

- Appraise the regulations and ethical requirement for the usage of experimental animals.
- Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
- Describe the various newer screening methods involved in the drug discovery process
- Appreciate and correlate the preclinical data to humans

THEORY

60 Hrs

1. Laboratory Animals 12
Common laboratory animals: Description, handling and Hrs
applications of different species and strains of animals.

Transgenic animals: Production, maintenance and applications
Anaesthesia and euthanasia of experimental animals.
Maintenance and breeding of laboratory animals.
CPCSEA guidelines to conduct experiments on animals

Good laboratory practice.
Bioassay-Principle, scope and limitations and methods

- 2 Preclinical screening of new substances for the 12
pharmacological activity using in vivo, in vitro, and other Hrs
possible animal alternative models.
General principles of preclinical screening. CNS Pharmacology:
behavioral and muscle coordination, CNS stimulants and

depressants, anxiolytics, anti-psychotics, anti epileptics and nootropics. Drugs for neurodegenerative diseases like Parkinsonism, Alzheimers and multiple sclerosis. Drugs acting on Autonomic Nervous System.

- 3 Preclinical screening of new substances for the pharmacological activity using in vivo, in vitro, and other possible animal alternative models. 12 Hrs

Respiratory Pharmacology: anti-asthmatics, drugs for COPD and anti allergics. Reproductive Pharmacology: Aphrodisiacs and antifertility agents Analgesics, antiinflammatory and antipyretic agents. Gastrointestinal drugs: anti ulcer, anti -emetic, anti-diarrheal and laxatives.

- 4 Preclinical screening of new substances for the pharmacological activity using in vivo, in vitro, and other possible animal alternative models. 12 Hrs

Cardiovascular Pharmacology: antihypertensives, antiarrhythmics, antianginal, antiatherosclerotic agents and diuretics. Drugs for metabolic disorders like anti-diabetic, antidyslipidemic agents. Anti cancer agents. Hepatoprotective screening methods.

- 5 Preclinical screening of new substances for the pharmacological activity using in vivo, in vitro, and other possible animal alternative models. 12 Hrs

limmunomodulators, Immunosuppressants and immunostimulants

General principles of immunoassay: theoretical basis and optimization of immunoassay, heterogeneous and homogenous immunoassay systems. Immunoassay methods evaluation; protocol outline, objectives and preparation. Immunoassay for digoxin and insulin

Limitations of animal experimentation and alternate animal experiments.

Extrapolation of in vitro data to preclinical and preclinical to humans

REFERENCES

1. Biological standardization by J.H. Burn D.J. Finney and I.G. Goodwin
2. Screening methods in Pharmacology by Robert Turner. A
3. Evaluation of drugs activities by Laurence and Bachrach
4. Methods in Pharmacology by Arnold Schwartz.
5. Fundamentals of experimental Pharmacology by M.N.Ghosh
6. Pharmacological experiment on intact preparations by Churchill Livingstone
7. Drug discovery and Evaluation by Vogel H.G.
8. Experimental Pharmacology by R.K.Goyal.
9. Preclinical evaluation of new drugs by S.K. Guta
10. Handbook of Experimental Pharmacology, SK.Kulkarni
11. Practical Pharmacology and Clinical Pharmacy, SK.Kulkarni, 3rd Edition.
12. David R.Gross. Animal Models in Cardiovascular Research, 2nd Edition, Kluwer Academic Publishers, London, UK.
13. Screening Methods in Pharmacology, Robert A.Turner.
14. Rodents for Pharmacological Experiments, Dr.Tapan Kumar chatterjee.
15. Practical Manual of Experimental and Clinical Pharmacology by Bikash Medhi (Author), Ajay Prakash (Author)

CELLULAR AND MOLECULAR PHARMACOLOGY
(MPL 104T)

Scope:

The subject imparts a fundamental knowledge on the structure and functions of cellular components and help to understand the interaction of these components with drugs. This information will further help the student to apply the knowledge in drug discovery process.

Objectives:

Upon completion of the course, the student shall be able to,

- Explain the receptor signal transduction processes.
- Explain the molecular pathways affected by drugs.
- Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
- Demonstrate molecular biology techniques as applicable for pharmacology

THEORY	60 Hrs
1. Cell biology	12
Structure and functions of cell and its organelles	Hrs
Genome organization. Gene expression and its regulation, importance of siRNA and micro RNA, gene mapping and gene sequencing	
Cell cycles and its regulation.	
Cell death– events, regulators, intrinsic and extrinsic pathways of apoptosis.	
Necrosis and autophagy.	
2 Cell signaling	12
Intercellular and intracellular signaling pathways.	Hrs
Classification of receptor family and molecular structure ligand gated ion channels; G-protein coupled receptors, tyrosine kinase receptors and nuclear receptors.	
Secondary messengers: cyclic AMP, cyclic GMP, calcium ion, inositol 1,4,5-trisphosphate, (IP3), NO, and diacylglycerol.	
Detailed study of following intracellular signaling pathways: cyclic AMP signaling pathway, mitogen-activated protein kinase (MAPK) signaling, Janus kinase (JAK)/signal transducer and activator of transcription (STAT) signaling pathway.	

- | | | |
|---|--|-----------|
| 3 | <p>Principles and applications of genomic and proteomic tools
 DNA electrophoresis, PCR (reverse transcription and real time),
 Gene sequencing, micro array technique, SDS page, ELISA and
 western blotting,
 Recombinant DNA technology and gene therapy
 Basic principles of recombinant DNA technology-Restriction
 enzymes, various types of vectors. Applications of recombinant
 DNA technology.
 Gene therapy- Various types of gene transfer techniques, clinical
 applications and recent advances in gene therapy.</p> | 12
Hrs |
| 4 | <p>Pharmacogenomics
 Gene mapping and cloning of disease gene.
 Genetic variation and its role in health/ pharmacology
 Polymorphisms affecting drug metabolism
 Genetic variation in drug transporters
 Genetic variation in G protein coupled receptors
 Applications of proteomics science: Genomics, proteomics,
 metabolomics, functionomics, nutrigenomics
 Immunotherapeutics
 Types of immunotherapeutics, humanisation antibody therapy,
 Immunotherapeutics in clinical practice</p> | 12
Hrs |
| 5 | <p>a. Cell culture techniques
 Basic equipments used in cell culture lab. Cell culture media,
 various types of cell culture, general procedure for cell cultures;
 isolation of cells, subculture, cryopreservation, characterization of
 cells and their application.
 Principles and applications of cell viability assays, glucose uptake
 assay, Calcium influx assays
 Principles and applications of flow cytometry</p> <p>b. Biosimilars</p> | 12
Hrs |

REFERENCES:

1. The Cell, A Molecular Approach. Geoffrey M Cooper.
2. Pharmacogenomics: The Search for Individualized Therapies. Edited by J. Licinio and M -L. Wong
3. Handbook of Cell Signaling (Second Edition) Edited by Ralph A. et.al
4. Molecular Pharmacology: From DNA to Drug Discovery. John Dickenson et.al
5. Basic Cell Culture protocols by Cheril D.Helgason and Cindy L.Miller
6. Basic Cell Culture (Practical Approach) by J. M. Davis (Editor)
7. Animal Cell Culture: A Practical Approach by John R. Masters (Editor)
8. Current porotocols in molecular biology vol I to VI edited by Frederick M.Ausuvet et la.

PHARMACOLOGICAL PRACTICAL - I
(MPL 105P)

1. Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
2. Simultaneous estimation of multi component containing formulations by UV spectrophotometry
3. Experiments based on HPLC
4. Experiments based on Gas Chromatography
5. Estimation of riboflavin/quinine sulphate by fluorimetry
6. Estimation of sodium/potassium by flame photometry

Handling of laboratory animals.

1. Various routes of drug administration.
2. Techniques of blood sampling, anesthesia and euthanasia of experimental animals.
3. Functional observation battery tests (modified Irwin test)
4. Evaluation of CNS stimulant, depressant, anxiogenics and anxiolytic, anticonvulsant activity.
5. Evaluation of analgesic, anti-inflammatory, local anesthetic, mydriatic and miotic activity.
6. Evaluation of diuretic activity.
7. Evaluation of antiulcer activity by pylorus ligation method.
8. Oral glucose tolerance test.
9. Isolation and identification of DNA from various sources (Bacteria, Cauliflower, onion, Goat liver).
10. Isolation of RNA from yeast
11. Estimation of proteins by Bradford/Lowry's in biological samples.
12. Estimation of RNA/DNA by UV Spectroscopy
13. Gene amplification by PCR.
14. Protein quantification Western Blotting.
15. Enzyme based in-vitro assays (MPO, AChEs, α amylase, α glucosidase).
16. Cell viability assays (MTT/Trypan blue/SRB).
17. DNA fragmentation assay by agarose gel electrophoresis.
18. DNA damage study by Comet assay.
19. Apoptosis determination by fluorescent imaging studies.
20. Pharmacokinetic studies and data analysis of drugs given by different routes of administration using softwares
21. Enzyme inhibition and induction activity
22. Extraction of drug from various biological samples and estimation of drugs in biological fluids using different analytical techniques (UV)
23. Extraction of drug from various biological samples and estimation of drugs in biological fluids using different analytical techniques (HPLC)

REFERENCES

1. CPCSEA, OECD, ICH, USFDA, Schedule Y, EPA guidelines,
2. Fundamentals of experimental Pharmacology by M.N.Ghosh
3. Handbook of Experimental Pharmacology by S.K. Kulkarni.
4. Drug discovery and Evaluation by Vogel H.G.
5. Spectrometric Identification of Organic compounds - Robert M Silverstein,
6. Principles of Instrumental Analysis - Douglas A Skoog, F. James Holler, Timothy A. Nieman,
7. Vogel's Text book of quantitative chemical analysis - Jeffery, Basset, Mendham, Denney,
8. Basic Cell Culture protocols by Cheril D. Helgason and Cindy L.Mille
9. Basic Cell Culture (Practical Approach) by J. M. Davis (Editor)
10. Animal Cell Culture: A Practical Approach by John R. Masters (Editor)
11. Practical Manual of Experimental and Clinical Pharmacology by Bikash Medhi(Author), Ajay Prakash (Author) Jaypee brothers' medical publishers Pvt. Ltd

ADVANCED PHARMACOLOGY - II
(MPL 201T)

Scope

The subject is designed to strengthen the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. In addition, the subject helps the student to understand the concepts of drug action and mechanism involved

Objectives

Upon completion of the course the student shall be able to:

- Explain the mechanism of drug actions at cellular and molecular level
- Discuss the Pathophysiology and pharmacotherapy of certain diseases
- Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

THEORY

	60 Hrs
1. Endocrine Pharmacology	12 Hrs
Molecular and cellular mechanism of action of hormones such as growth hormone, prolactin, thyroid, insulin and sex hormones Anti-thyroid drugs, Oral hypoglycemic agents, Oral contraceptives, Corticosteroids. Drugs affecting calcium regulation	
2 Chemotherapy	12 Hrs
Cellular and molecular mechanism of actions and resistance of antimicrobial agents such as β -lactams, aminoglycosides, quinolones, Macrolide antibiotics. Antifungal, antiviral, and anti-TB drugs.	
3 Chemotherapy	12 Hrs
Drugs used in Protozoal Infections Drugs used in the treatment of Helminthiasis Chemotherapy of cancer Immunopharmacology Cellular and biochemical mediators of inflammation and immune response. Allergic or hypersensitivity reactions. Pharmacotherapy of asthma and COPD. Immunosuppressants and Immunostimulants	

- | | | |
|---|---|-----------|
| 4 | <p>GIT Pharmacology
 Antiulcer drugs, Prokinetics, antiemetics, anti-diarrheals and drugs for constipation and irritable bowel syndrome.
 Chronopharmacology
 Biological and circadian rhythms, applications of chronotherapy in various diseases like cardiovascular disease, diabetes, asthma and peptic ulcer</p> | 12
Hrs |
| 5 | <p>Free radicals Pharmacology
 Generation of free radicals, role of free radicals in etiopathology of various diseases such as diabetes, neurodegenerative diseases and cancer.
 Protective activity of certain important antioxidant
 Recent Advances in Treatment:
 Alzheimer's disease, Parkinson's disease, Cancer, Diabetes mellitus</p> | 12
Hrs |

REFERENCES

1. The Pharmacological basis of therapeutics- Goodman and Gill man's
2. Principles of Pharmacology. The Pathophysiologic basis of drug therapy by David E Golan et al.
3. Basic and Clinical Pharmacology by B.G -Katzung
4. Pharmacology by H.P. Rang and M.M. Dale.
5. Hand book of Clinical Pharmacokinetics by Gibaldi and Prescott.
6. Text book of Therapeutics, drug and disease management by E T. Herfindal and Gourley.
7. Applied biopharmaceutics and Pharmacokinetics by Leon Shargel and Andrew B.C.Yu.
8. Handbook of Essential Pharmacokinetics, Pharmacodynamics and Drug Metabolism for Industrial Scientists
9. Robbins & Cortan Pathologic Basis of Disease, 9th Ed. (Robbins Pathology)
10. A Complete Textbook of Medical Pharmacology by Dr. S.K Srivastava published by APC Avichal Publishing Company.
11. KD.Tripathi. Essentials of Medical Pharmacology
12. Principles of Pharmacology. The Pathophysiologic basis of drug Therapy by David E Golan, Armen H, Tashjian Jr, Ehrin J, Armstrong, April W, Armstrong, Wolters, Kluwer-Lippincott Williams & Wilkins Publishers

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING
METHODS-II
(MPL 202T)

Scope:

This subject imparts knowledge on the preclinical safety and toxicological evaluation of drug & new chemical entity. This knowledge will make the student competent in regulatory toxicological evaluation.

Objectives:

Upon completion of the course, the student shall be able to,

- Explain the various types of toxicity studies.
- Appreciate the importance of ethical and regulatory requirements for toxicity studies.
- Demonstrate the practical skills required to conduct the preclinical toxicity studies.

	THEORY	60 Hrs
1.	Basic definition and types of toxicology (general, mechanistic, regulatory and descriptive) Regulatory guidelines for conducting toxicity studies OECD, ICH, EPA and Schedule Y OECD principles of Good laboratory practice (GLP) History, concept and its importance in drug development	12 Hrs
2	Acute, sub-acute and chronic- oral, dermal and inhalational studies as per OECD guidelines. Acute eye irritation, skin sensitization, dermal irritation & dermal toxicity studies. Test item characterization- importance and methods in regulatory toxicology studies	12 Hrs
3	Reproductive toxicology studies, Male reproductive toxicity studies, female reproductive studies (segment I and segment III), teratogenicity studies (segment II) Genotoxicity studies (Ames Test, in vitro and in vivo Micronucleus and Chromosomal aberrations studies) In vivo carcinogenicity studies	12 Hrs
4	IND enabling studies (IND studies)- Definition of IND, importance of IND, industry perspective, list of studies needed for IND submission.	12 Hrs

Safety pharmacology studies- origin, concepts and importance of safety pharmacology.

Tier1- CVS, CNS and respiratory safety pharmacology, HERG assay. Tier2- GI, renal and other studies

- 5 Toxicokinetics- Toxicokinetic evaluation in preclinical studies, 12 saturation kinetics Importance and applications of toxicokinetic Hrs studies.
Alternative methods to animal toxicity testing.

REFERENCES

1. Hand book on GLP, Quality practices for regulated non-clinical research and development (<http://www.who.int/tdr/publications/documents/glp-handbook.pdf>).
2. Schedule Y Guideline: drugs and cosmetics (second amendment) rules, 2005, ministry of health and family welfare (department of health) New Delhi
3. Drugs from discovery to approval by Rick NG.
4. Animal Models in Toxicology, 3rd Edition, Lower and Bryan
5. OECD test guidelines.
6. Principles of toxicology by Karen E. Stine, Thomas M. Brown.
7. Guidance for Industry M3(R2) Nonclinical Safety Studies for the Conduct of Human Clinical Trials and Marketing Authorization for Pharmaceuticals (<http://www.fda.gov/downloads/drugs/guidancecomplianceregulatoryinformation/guidances/ucm073246.pdf>)

PRINCIPLES OF DRUG DISCOVERY (MPL 203T)

Scope:

The subject imparts basic knowledge of drug discovery process. This information will make the student competent in drug discovery process

Objectives:

Upon completion of the course, the student shall be able to,

- Explain the various stages of drug discovery.
- Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery
- Explain various targets for drug discovery.
- Explain various lead seeking method and lead optimization
- Appreciate the importance of the role of computer aided drug design in drug discovery

THEORY	60 Hrs
1. An overview of modern drug discovery process: Target identification, target validation, lead identification and lead Optimization. Economics of drug discovery. Target Discovery and validation-Role of Genomics, Proteomics and Bioinformatics. Role of Nucleic acid microarrays, Protein microarrays, Antisense technologies, siRNAs, antisense oligonucleotides, Zinc finger proteins. Role of transgenic animals in target validation.	12 Hrs
2 Lead Identification- combinatorial chemistry & high throughput screening, in silico lead discovery techniques, Assay development for hit identification. Protein structure Levels of protein structure, Domains, motifs, and folds in protein structure. Computational prediction of protein structure: Threading and homology modeling methods. Application of NMR and X-ray crystallography in protein structure prediction	12 Hrs
3 Rational Drug Design Traditional vs rational drug design, Methods followed in traditional drug design, High throughput screening, Concepts of Rational Drug Design, Rational Drug Design Methods: Structure and Pharmacophore based approaches	12 Hrs

- Virtual Screening techniques: Drug likeness screening, Concept of pharmacophore mapping and pharmacophore based Screening,
- | | | |
|---|---|-----------|
| 4 | Molecular docking: Rigid docking, flexible docking, manual docking; Docking based screening. De novo drug design. Quantitative analysis of Structure Activity Relationship History and development of QSAR, SAR versus QSAR, Physicochemical parameters, Hansch analysis, Fee Wilson analysis and relationship between them. | 12
Hrs |
| 5 | QSAR Statistical methods – regression analysis, partial least square analysis (PLS) and other multivariate statistical methods. 3D-QSAR approaches like COMFA and COMSIA Prodrug design-Basic concept, Prodrugs to improve patient acceptability, Drug solubility, Drug absorption and distribution, site specific drug delivery and sustained drug action. Rationale of prodrug design and practical consideration of prodrug design | 12
Hrs |

REFERENCES

1. MouldySioud. Target Discovery and Validation Reviews and Protocols: Volume 2 Emerging Molecular Targets and Treatment Options. 2007 Humana Press Inc.
2. Darryl León. Scott Markelln. Silico Technologies in Drug Target Identification and Validation. 2006 by Taylor and Francis Group, LLC.
3. Johanna K. DiStefano. Disease Gene Identification. Methods and Protocols. Springer New York Dordrecht Heidelberg London.
4. Hugo Kubiny. QSAR: Hansch Analysis and Related Approaches. Methods and Principles in Medicinal Chemistry. Publisher Wiley-VCH
5. Klaus Gubernator, Hans-Joachim Böhm. Structure-Based Ligand Design. Methods and Principles in Medicinal Chemistry. Publisher Wiley-VCH
6. Abby L . Parrill. M . Rami Reddy. Rational Drug Design. Novel Methodology and Practical Applications. ACS Symposium Series; American Chemical Society: Washington, DC, 1999.
7. J. Rick Turner. New drug development design, methodology and, analysis. John Wiley & Sons, Inc., New Jersey.

CLINICAL RESEARCH AND PHARMACOVIGILANCE (MPL 204T)

Scope:

This subject will provide a value addition and current requirement for the students in clinical research and pharmacovigilance. It will teach the students on conceptualizing, designing, conducting, managing and reporting of clinical trials. This subject also focuses on global scenario of Pharmacovigilance in different methods that can be used to generate safety data. It will teach the students in developing drug safety data in Pre-clinical, Clinical phases of Drug development and post market surveillance.

Objectives:

Upon completion of the course, the student shall be able to,

- Explain the regulatory requirements for conducting clinical trial
- Demonstrate the types of clinical trial designs
- Explain the responsibilities of key players involved in clinical trials
- Execute safety monitoring, reporting and close-out activities
- Explain the principles of Pharmacovigilance
- Detect new adverse drug reactions and their assessment
- Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance

THEORY		60 Hrs
1.	Regulatory Perspectives of Clinical Trials: Origin and Principles of International Conference on Harmonization - Good Clinical Practice (ICH-GCP) guidelines Ethical Committee: Institutional Review Board, Ethical Guidelines for Biomedical Research and Human Participant-Schedule Y, ICMR Informed Consent Process: Structure and content of an Informed Consent Process Ethical principles governing informed consent process	12 Hrs
2	Clinical Trials: Types and Design Experimental Study- RCT and Non RCT, Observation Study: Cohort, Case Control, Cross sectional Clinical Trial Study Team Roles and responsibilities of Clinical Trial Personnel: Investigator, Study Coordinator, Sponsor, Contract Research Organization and its management	12 Hrs

- | | | |
|---|---|-----------|
| 3 | Clinical Trial Documentation- Guidelines to the preparation of documents, Preparation of protocol, Investigator Brochure, Case Report Forms, Clinical Study Report Clinical Trial Monitoring-Safety Monitoring in CT
Adverse Drug Reactions: Definition and types. Detection and reporting methods. Severity and seriousness assessment. Predictability and preventability assessment, Management of adverse drug reactions; Terminologies of ADR. | 12
Hrs |
| 4 | Basic aspects, terminologies and establishment of pharmacovigilance
History and progress of pharmacovigilance, Significance of safety monitoring, Pharmacovigilance in India and international aspects, WHO international drug monitoring programme, WHO and Regulatory terminologies of ADR, evaluation of medication safety, Establishing pharmacovigilance centres in Hospitals, Industry and National programmes related to pharmacovigilance. Roles and responsibilities in Pharmacovigilance | 12
Hrs |
| 5 | Methods, ADR reporting and tools used in Pharmacovigilance
International classification of diseases, International Non-proprietary names for drugs, Passive and Active surveillance, Comparative observational studies, Targeted clinical investigations and Vaccine safety surveillance. Spontaneous reporting system and Reporting to regulatory authorities, Guidelines for ADRs reporting. Argus, Aris G Pharmacovigilance, VigiFlow, Statistical methods for evaluating medication safety data. | 12
Hrs |
| 6 | Pharmacoepidemiology, pharmacoconomics, safety pharmacology | 12
Hrs |

REFERENCES

1. Central Drugs Standard Control Organization- Good Clinical Practices, Guidelines for Clinical Trials on Pharmaceutical Products in India. New Delhi: Ministry of Health;2001.
2. International Conference on Harmonization of Technical requirements for registration of Pharmaceuticals for human use. ICH Harmonized Tripartite Guideline. Guideline for Good Clinical Practice.E6; May 1996.

3. Ethical Guidelines for Biomedical Research on Human Subjects 2000. Indian Council of Medical Research, New Delhi.
4. Textbook of Clinical Trials edited by David Machin, Simon Day and Sylvan Green, March 2005, John Wiley and Sons.
5. Clinical Data Management edited by R K Rondels, S A Varley, C F Webbs. Second Edition, Jan 2000, Wiley Publications.
6. Handbook of clinical Research. Julia Lloyd and Ann Raven Ed. Churchill Livingstone.
7. Principles of Clinical Research edited by Giovanna di Ignazio, Di Giovanna and Haynes.

PHARMACOLOGICAL PRACTICAL - II
(MPL 205P)

1. To record the DRC of agonist using suitable isolated tissues preparation.
2. To study the effects of antagonist/potentiating agents on DRC of agonist using suitable isolated tissue preparation.
3. To determine the strength of unknown sample by matching bioassay by using suitable tissue preparation.
4. To determine the strength of unknown sample by interpolation bioassay by using suitable tissue preparation.
5. To determine the strength of unknown sample by bracketing bioassay by using suitable tissue preparation.
6. To determine the strength of unknown sample by multiple point bioassay by using suitable tissue preparation.
7. Estimation of PA_2 values of various antagonists using suitable isolated tissue preparations.
8. To study the effects of various drugs on isolated heart preparations.
9. Recording of rat BP, heart rate and ECG.
10. Recording of rat ECG.
11. Drug absorption studies by averted rat ileum preparation.
12. Acute oral toxicity studies as per OECD guidelines.
13. Acute dermal toxicity studies as per OECD guidelines.
14. Repeated dose toxicity studies- Serum biochemical, haematological, urine analysis, functional observation tests and histological studies.
15. Drug mutagenicity study using mice bone-marrow chromosomal aberration test.
16. Protocol design for clinical trial.(3 Nos.)
17. Design of ADR monitoring protocol.
18. In-silico docking studies. (2 Nos.)
19. In-silico pharmacophore based screening.
20. In-silico QSAR studies.
21. ADR reporting

REFERENCES

1. Fundamentals of experimental Pharmacology-by M.N.Ghosh
2. Hand book of Experimental Pharmacology-S.K.Kulakarni
3. Text book of in-vitro practical Pharmacology by Ian Kitchen
4. Bioassay Techniques for Drug Development by Atta-ur-Rahman, Iqbal choudhary and William Thomsen
5. Applied biopharmaceutics and Pharmacokinetics by Leon Shargel and Andrew B.C.Yu.
6. Handbook of Essential Pharmacokinetics, Pharmacodynamics and Drug Metabolism for Industrial Scientists.

Semester III
MRM 301T - Research Methodology & Biostatistics

UNIT – I

General Research Methodology: Research, objective, requirements, practical difficulties, review of literature, study design, types of studies, strategies to eliminate errors/bias, controls, randomization, crossover design, placebo, blinding techniques.

UNIT – II

Biostatistics: Definition, application, sample size, importance of sample size, factors influencing sample size, dropouts, statistical tests of significance, type of significance tests, parametric tests (students "t" test, ANOVA, Correlation coefficient, regression), non-parametric tests (wilcoxon rank tests, analysis of variance, correlation, chi square test), null hypothesis, P values, degree of freedom, interpretation of P values.

UNIT – III

Medical Research: History, values in medical ethics, autonomy, beneficence, non-maleficence, double effect, conflicts between autonomy and beneficence/non-maleficence, euthanasia, informed consent, confidentiality, criticisms of orthodox medical ethics, importance of communication, control resolution, guidelines, ethics committees, cultural concerns, truth telling, online business practices, conflicts of interest, referral, vendor relationships, treatment of family members, sexual relationships, fatality.

UNIT – IV

CPCSEA guidelines for laboratory animal facility: Goals, veterinary care, quarantine, surveillance, diagnosis, treatment and control of disease, personal hygiene, location of animal facilities to laboratories, anesthesia, euthanasia, physical facilities, environment, animal husbandry, record keeping, SOPs, personnel and training, transport of lab animals.

UNIT – V

Declaration of Helsinki: History, introduction, basic principles for all medical research, and additional principles for medical research combined with medical care.

**B.A. LL.B.5 Years Integrated Course
(Semester-VII)
Paper- BL-701-Sociology- II (w.e.f. 2020-21)**

**Maximum Marks: 60+40=100
Written Examination-60
Internal Assessment-40
Max. Time - 3 hrs.**

Important Note:

- (i) The whole syllabi shall be divided into four units I to IV.
- (ii) The question paper shall carry two Parts (Part 'A' and Part 'B').
- (iii) Part 'A' shall comprise one Compulsory Question of 12 marks containing four short-answer questions spread over all the four units of the syllabi, each question carrying 3 marks.
- (iv) There shall be eight questions in Part 'B' with two questions from each of the four units. The candidates shall be required to attempt four questions from Part 'B' selecting one question from each unit. Each question shall carry 12 marks.

Unit-I

Social Stratification: Meaning
Social Class Meaning & Nature, Marxian Concepts of Class
Meaning of Caste, Caste and Class, Origin of Caste System, Merits and Demerits of Caste System, Views of B.R Ambedkar on Caste System in India
Role and status: Meaning, Types and difference between Role and Status Social mobility:
Meaning, Forms, Factors

Unit-II

Social changes: Meaning Theories of Social Change, Factors of Social Change
Modernization, Urbanization, Westernization
Law as an Instrument of Social Change in India
Culture: Meaning, Forms and Theories

Unit-III

Social Control: Meaning, Need and Purpose of Social Control,
Means of Social Control-Formal and Informal Means
Public Opinion: Meaning, Agents of Public Opinions
Law and Morality

Unit-IV

Human Ecology: Meaning
National Community: Meaning, Nation and State, Secularization
Urban Community: Meaning, Features and types of urban community
Rural Community: Meaning, Features, Types, Difference between Rural and Urban Community, Rural Continuum

Suggested Books:

Bottomore, T.B.	1972	:	Sociology: A guide to Problems and literature Blackie &
Harlabos, M.	1998	:	Son (India) Ltd. Sociology: Themes and perspectives, New Delhi: Oxford University Press.
Maclver, R.M. and page, Charles H	1996	:	Society: An Introductory Analysis Macmillan India Limited
Bhat Ishwara, P	2009	:	Law and Social Transformation, Eastern Book Company, Lucknow
Ahuja, Ram	1997	:	Social Problems in India New Delhi: Rawat.
Dube, S.C.	1992	:	Indian Society New Delhi: National Book Trust
Sing, Yogender	2004	:	Modernization of Indian Tradition
Bhushan, Vidya and Sachdeva, D.R.		:	An Introduction to Sociology, Kitab Mahal, Allahabad

Rajind
18/08/2020
Dean
Faculty of Law
Maharishi Markandeshwar
(Deemed to be University)
Mullana (Ambala)-133207

Samsal
18/8/2020

18/8/2020

18/8/20

18/8/2020

18/8/2020

change
Annexure-4

**B.A. LL.B. 5 Years Integrated Course Common with B.B.A. LL.B. (Hons.) 5 Years Integrated Course
and
B.Com. LL.B. (Hons.) 5 Years Integrated Course
(Semester-X)**

Paper-LAW-1002-Land Laws including Tenure and Tenancy (w.e.f. 2020-21)
Maximum Marks:60+40=100
Written Examination-60
Internal Assessment-40
Max. Time - 3 hrs.

Important Note:

- (i) The whole syllabi shall be divided into four units I to IV.
- (ii) The question paper shall carry two Parts (Part 'A' and Part 'B').
- (iii) Part 'A' shall comprise one Compulsory Question of 12 marks containing four short-answer questions spread over all the four units of the syllabi, each question carrying 3 marks.
- (iv) There shall be eight questions in Part 'B' with two questions from each of the four units. The candidates shall be required to attempt four questions from Part 'B' selecting one question from each unit. Each question shall carry 12 marks.

Unit-I

The Punjab Land Revenue Act, 1887(as applicable to Haryana), Definitions (Sec 3)
Exclusion of certain lands from operation of Act (Sec 4)
Revenue Officers- Classes & Powers (Sec 6-30)
Records (Sec 31-47); Assessment (Sec 48-60 C)
Collection of Land Revenue (Sec 61-99)

Unit-II

- (a) **The Punjab Land Revenue Act, 1887(as applicable to Haryana)**
Partition (Sec 110-126); Arbitration (Sec 127-135); Supplemental Provisions (Sec 138-158)
- (b) **The Punjab Tenancy Act, 1887 (as applicable to Haryana)**
Definitions (Sec 4)
Rent (Sec 12-34)
Relinquishment, Abandonment & Ejectment (Sec 35-51)
Improvement & Compensation (Sec 61-74)

Unit-III

- (a) **The Haryana Ceiling on Land Holdings Act, 1972**
Definitions (Sec 3), Permissible Area (Sec 4)
Exemptions (Sec 5), Ceiling on Lands etc. (Sec 7-17)
Miscellaneous (Sec 18-33)
- (b) **The Punjab village common Lands (Regulation) Act, 1961 (as applicable to Haryana)**
Definitions (Sec 2)
Lands to which this Act applies (Sec 3)
Vesting to Rights & Regulation of use & occupation etc. of Lands (Sec 4-6)
Power to put Panchayat in Possession & cancel or vary leases etc. of Lands (Sec 7-12)
Ban of Jurisdiction of Civil Courts (Sec 13-15)

Unit-IV

Rights to Free Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013

Definitions (Sec 3), Procedure of Acquisition (Sec 4-26), Determination of Compensation (27-31 and 70), Rehabilitation and Resettlement Award (Sec32-43), Appeal (Sec 75)

Suggested Books:

Gupta	:	A Land Acquisition Act
O.P Aggarwal	:	The Punjab Tenancy Act, 1887
O.P. Aggarwal	:	The Land Revenue Act, 1887
Jain	:	The Punjab Village Common Land's Act, 1961
Baryam Singh Saini	:	Treatise on Village Common Land (P & H)
D.P.Narula	:	Punjab & Haryana Land Laws
Kaul's	:	Punjab Land Laws
Bare Act:		Land Acquisition, Rehabilitation and Resettlement Act 2013

Baird
10/08/2020
Dean
Faculty of Law
Maharishi Markandeshwar
(Deemed to be University)
Mullana (Ambala)-133207

RLS
18/8/2020

Gupta
18/8/20

Dansal
18/8/2020

Ju
18/8/2020

Singh
18/8/2020

**B.A. LL.B. 5 Years Integrated Course Common with B.B.A. LL.B. (Hons.) 5 Years Integrated Course and
B.Com. LL.B. (Hons.) 5 Years Integrated Course
(Semester-I)
Paper-LAW-105- Tort and Consumer Protection Laws (w.e.f. 2020-21)**

**Maximum Marks:60+40=100
Written Examination-60
Internal Assessment-40
Max. Time - 3 hrs.**

Important Note:

- (i) The whole syllabi shall be divided into four units I to IV.
- (ii) The question paper shall carry two Parts (Part 'A' and Part 'B').
- (iii) Part 'A' shall comprise one Compulsory Question of 12 marks containing four short-answer questions spread over all the four units of the syllabi, each question carrying 3 marks.
- (iv) There shall be eight questions in Part 'B' with two questions from each of the four units. The candidates shall be required to attempt four questions from Part 'B' selecting one question from each unit. Each question shall carry 12 marks.

UNIT I

Definition and Nature of Tort, Tortious Liability
Legal Damage – Damnum sine injuria, Injuria sine damno
General Defences and Capacity
Strict / Absolute Liability, Vicarious Liability

UNIT II

Trespass to person, Assault, Battery, Maim
Trespass to Land, Trespass Ab initio
False imprisonment, Malicious Prosecution
Defamation,

UNIT III

Nuisance
Négligence
Contributory Negligence and Nervous Shock
Conversion, Detinue and Passing off, Remoteness of damage

UNIT IV

The Consumer Protection Act, 2019
Preliminary; Consumer Protection Council, Central Consumer Protection Authority,
Consumer Disputes Redressal Agencies; Mediation, Product Liability, Offences and Penalties,
Miscellaneous

Suggested Books:

- | | | | |
|----|------------------------|---|----------------------|
| 1. | Rattan Lal Dheeraj Lal | : | Law of Torts |
| 2. | Winfield | : | Law of Torts |
| 3. | S. Rama Swami Iyer | : | Law of Torts |
| 4. | Salmond | : | Law of Torts |
| 5. | D.D. Basu | : | Law of Torts |
| 6. | The Consumer | : | Bare Act |
| | | | Protection Act, 2019 |
| 7. | Richard Kidner | : | Casebook on Torts |

Raind
18/08/2020
Dear
Faculty of Law
Maharishi Markandeshwar
(Deemed to be University)
Mullana (Ambala)-133207

R/S
18/8/2020

Jayanti
18/8/20

Suj
18/8/2020

Dansal
18/8/2020

S
18/8/2020