

**M.M. INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS MANAGEMENT**  
**MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY), MULLANA**  
 (Established under Section 3 of the UGC Act, 1956)  
 (Accredited by NAAC with Grade 'A++')

**Action Taken Report of Analysis of Feedback on Curriculum for the Session 2022-2023**

Curriculum revision is a crucial process that helps institutions stay up-to-date with industry trends and provide the best possible education to students. Institute is dedicated to improving its curriculum by actively seeking feedback from various stakeholders. Feedback received from stakeholders is analyzed and all the relevant suggestions are considered. As per the suggestions given by different stakeholders, curriculum of BCA-2<sup>nd</sup> year and MCA-2<sup>nd</sup> year has been revised w.e.f. session 2023-24.

<b>BCA-3<sup>rd</sup> Semester</b>				
Sr. No	Subject	Stakeholder(s)	Suggestions	Actions Taken
1.	BCA-301: Database Management System	Dr. Bharti Sharma(Faculty)	More topics of E-R Model such as Minimization of ER diagram, Recursive Relationships should be added in the syllabus.	Suggested topics are added in the subject
		Anurag Kumar (BCA-2 <sup>nd</sup> Year Student)	Topic of Mapping from ER model to Relational model should be added.	Suggested topics are added in the subject
2.	BCA-302: Web Designing Fundamentals	Yogita Gogia - (Alumni)	Advanced CSS should be added in the syllabus.	Advanced CSS is added in the subject.
		Ms. Rubika Walia(Faculty)	Topics of Document Object Model and JS Browser Object Model should be added in the syllabus	Suggested topics are added in subject.
<b>BCA 4<sup>th</sup> – Semester</b>				
1.	BCA-402: Python Programming	Dr. Pooja Rani(Faculty)	Students should know the concepts of string manipulation functions and constructors in Python.	Topics are added in the subject.
		Komal Sharma BCA- 2 <sup>nd</sup> yr Student	Tkinter Widgets should be taught in detail.	Topic has been added in the subject.
2.	BCA-403: Operating System	Ms. Priyanka Verma(Faculty)	Topics of Reader writer problem and producer-consumer problem should be added in the subject.	Suggested topics have been added.
		Amit Kumar BCA-2 <sup>nd</sup> Yr Student	Students should be taught about Pre-emptive and Non Pre-emptive Scheduling Algorithms.	Pre-emptive and Non Pre-emptive Scheduling Algorithms have been added in the subject.
		Yogita Gogia- (Alumni)	Fragmentation is an important concept in operating system. It should be added in the subject.	Topic of fragmentation is added in the subject.

3.	BCA-404: Software Engineering	Dr. Neha Goyal(Faculty)	Students should be introduced to concept of Agile development and different design approaches.	Agile development and design approaches are added in the subject.
		Lakshya Sharma - (Alumni)	Topics of RAD model, 4th Generation model, and Iterative enhancement model should be added in this subject's syllabus.	Suggested topics have been added in the syllabus.

#### MCA-3<sup>rd</sup> Semester

Sr. No	Subject	Stakeholder(s)	Suggestions	Actions Taken
1.	MCA-301: Programming With Python	Mr. Gautam Kumar (Faculty)	Data Science using Python should be added in the subject.	Topics related to data science have been added
		Ms. Kalpana Sharma- (Industry Professional)	Students should also be taught using different data structures in Python.	Topics related to data structures are added in the subject.
2.	MCA-302: Cloud Computing	Dr. Minakshi Sharma(Faculty)	More cloud computing platforms should be added in the subject.	Suggested change has been done in the syllabus.
3.	MCA-304(a): Advanced Java Programming	Mr. Girish V. Nandinath- (Employer)	Students should be taught about different design patterns in java.	Topics related to design patterns are introduced in the subject.
		Shubham Jyoti (MCA-2 <sup>nd</sup> Yr Student)	Topic of Transaction management and connection pooling should be added in the subject.	Suggested topic is added in the subject.
4.	MCA-304(b): Mobile Application Development	Dr. Dalip Kamboj (Faculty)	Topics related to RecyclerView View and Adapters should be added in the subject.	Suggested topics are added in the syllabus.
		Mr. Arun Thapar (Employer)	In industry there is high demand of Flutter, it should be added in the subject.	Topics related to Flutter have been added in the subject.
5.	MCA-305(a): Artificial Intelligence	Dr. Ravi Kumar Sharma(Faculty)	Concept of intelligent agents should be introduced.	Various types of intelligent agents are added in the subject.
		Ms. Shruti Garg (Industry Professional)	Soft Computing is an important concept in AI. It should be added in the subject.	Topics related to soft computing are added in the subject.
6.	MCA-305(b): Software Project Management	Mr. Vivek Bhatnagar (Faculty)	Topics of Six Sigma and Model based software architecture should be added in the subject.	Suggested topics are added in subject.

#### MCA-4<sup>th</sup> Semester

1.	MCA-401: Machine Learning	Mr. Tejbir Singh (Faculty)	Concept of Feature Scaling and Feature Selection methods should be introduced in subject.	Suggested changes are done in the subject.
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		Ms. Shruti Garg - (Industry Professional)	Topics of back-propagation algorithm and Kernel functions should be added in the syllabus.	Suggested topics are added in the syllabus.
2.	MCA-402: Open Source Technology Using PHP	Mr. Gulbir Singh (Faculty)	Concept of creating dynamic web pages with forms should be added in the subject.	Suggested change has been done.
		Shruti (MCA- 2 <sup>nd</sup> Yr Student)	Object Oriented Concepts with PHP should be added in the subject.	Object Oriented Concepts are added in syllabus.
3.	MCA-403(a): Blockchain Technology	Dr. Swati Rawat (Faculty)	Topic of Sharding based consensus algorithm to prevent attacks should be added.	Suggested topic is added in the subject.
4.	MCA-403(c): Design and Analysis of Algorithm	Dr. Rashmi (Faculty)	Topics related to Hash Tables should be added.	Topics related to Hash Tables are added in the subject.
		Shubham Jyoti (MCA- 2 <sup>nd</sup> Yr Student)	Shortest path algorithms should be added.	Suggested topics are added in the subject.
		Ms. Kalpana Sharma – (Industry Professional)	More topics of computational complexity such as Traveling Salesman Problem, Knapsack, Bin Packing, Satisfiability, Vertex Cover, Clique, Independent Set should be added.	Suggested topics are added.
5.	MCA-404(a): Big Data	Dr. Chandni Sharma (Faculty)	More topics of Hadoop such as Loading data into Hadoop, Handling files in Hadoop, Getting data from Hadoop should be added.	Topics of Loading data into Hadoop, Handling files in Hadoop, Getting data from Hadoop are added in the subject.
		Mr. Arun Thapar (Employer)	Hadoop 3 should be added	Suggested topic is added in the subject.
6.	MCA-404(b): Data Mining & Warehousing	Ms. Ritu Mishra (Faculty)	Topics of Feature Extraction, feature transformation, feature selection should be added.	Suggested topics are added in the subject.
		Lakshya Sharma - (Alumni)	Algorithms of classification such as DecisionTree-Based Algorithms, Neural Network-Based Algorithms, Rule-Based Algorithms should be added.	Classification algorithms are added in the subject.
7.	MCA-404(c): Internet of Things	Ms. Prabhjot Kaur (Faculty)	Embedded System platforms for IoT should be added in syllabus.	Embedded System platforms for IoT such as Arduino and Raspberry Pi are added in syllabus.

		Kajal Saini(MCA- 2 <sup>nd</sup> Yr Student)	Topics of Reference model for IoT and IoT Enabling techniques should be added in subject.	Suggested topics are added.
8.	MCA	Mr. Girish V. Nandinath-(Employer)	Subject of NoSQL Database should be introduced.	NoSQL subject is added in the 3rd semester.

Feedback Committee

Principal

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**FACULTY FEEDBACK ON SCHEME & SYLLABI**

Name Gautam Kumar Designation Assistant Professor

Sr. No.	Class	Code/Subject	Suggestion
1.	MCA	MCA:301 Programming with python	Data Science using python should be added in the subject
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Signature



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**STUDENT FEEDBACK ON SCHEME & SYLLABI**

Name Shubham Jyoti Roll No. 1321708  
Class MCA 4<sup>th</sup> Batch 2021-23

Sr. No.	Paper/Subject	Suggestions
1.	MCA-304(A) Advance Java	Topic of Transaction management and connection Pooling should be
2.	Programming.	added in the subject.
3.	MCA-403 (c)	Shortest Path algorithms should be added.
4.	Design and Analysis of Algorithm	
5.		
6.		
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8.		

(Please attach separate sheet if needed)

Shubham  
Signature

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**ALUMNI FEEDBACK ON SCHEME & SYLLABI**

Name Yogita Gogia Batch 2017-20

Designation Software Developer

Official Address DeLoitte (Hydrabad)

Contact No. 7417288240 Mail-Id yogita.gogia19@gmail.com

Sr. No.	Class	Subject	Suggestion
1.	BCA 3 <sup>rd</sup>	BCA-302	Advanced CSS Should be added in the syllabus.
2.		Web designing Fundamentals	
3.	BCA 4 <sup>th</sup>	BCA-403	Fragmentation is an important concept in operating system. It should be added in the subject.
4.		Operating System	
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(Please attach separate sheet if needed)

Yogita

**Signature**

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**INDUSTRY PROFESSIONAL FEEDBACK ON SCHEME & SYLLABI**

Name Shruti Bary Designation Associate Implementation Consultant.  
Official Address Edifecs. Technologies Pvt. LTD.  
Mahali

Contact No. 70158-55560 Mail-Id shruti-garg153@gmail.com

Sr. No.	Class	Subject	Suggestion
1.	MCA 3rd	MCA-305 (a)	Concept of Soft Computing should be added in AI.
2.		Artificial Intelligence	
3.	MCA 4th	MCA-401	Topic of Back Propagation Algorithm & kernel function should be added in Syllabus.
4.		Machine-learning	
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8.			

(Please attach separate sheet if needed)

Shruti  
Signature



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**EMPLOYER FEEDBACK ON SCHEME & SYLLABI**

Name Girish V. Nandinath Designation Head Talent Acquisition

Official Address TCS

Contact No. 011-66506555 Mail-Id careers@tcs.com

Sr. No.	Class	Subject	Suggestion
1.	MCA 3 <sup>rd</sup>	MCA-304(a) Advanced	Students should be taught about different design
2.		Java Program- ming	Patterns in Java.
3.	MCA		Subject of NoSQL data- base should be introduced
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G. Nandinath  
Signature



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Minutes of the meeting of Board of Studies in Computer Applications was held on 17-07-2023 (Monday) at 12:50 pm in the Board Room of M.M. Institute of Computer Technology & Business Management, MM (DU), Mullana in hybrid mode. The meeting of BOS fixed for 12.07.2023 was postponed and held on 17.07.2023.

**The following members attended the meeting:**

- |   |                 |
|---|-----------------|
| 1. Dr. Sumit Mittal, Professor, MMICTBM   | Chairman, BOS   |
| 2. Dr. Sonal Chawla, Professor,<br>Dept. of Computer Science & Applications,<br>Panjab University, Chandigarh | External Expert |
| 3. Dr. Munishwar Rai, Professor, MMICTBM  | Member          |
| 4. Dr. Rattan Pal Singh Rana, Professor, MMICTBM  | Member          |
| 5. Dr. Dalip, Assoc. Professor, MMICTBM   | Member          |
| 6. Dr. Deepa Nehra, Assoc. Professor, MMICTBM   | Member          |
| 7. Dr. Pooja Rani, Asstt. Professor, MMICTBM  | Member          |
| 8. Ms. Manju Bagga, Asstt. Professor, MMICTBM   | Member          |

Mr. Mukesh Gupta (External Expert) could not attend the meeting.

Chairman, BOS welcomed all the members especially the external expert for attending the meeting.

**The following items were discussed and approved:**

1. The minutes of the last meeting of Board of Studies held on 09.03.2023 were circulated on 10.03.2023 among all the members. Since no comment has been received, the house confirmed the minutes of meeting and action taken report of the said meeting.
2. Considered and approved the minor changes in the scheme of the following courses as per NEP-2020 under Choice Based Credit Scheme (CBCS) from the batch 2022-26 onwards (Post Facto Approval):
  - (i) BCA
  - (ii) BCA with specialization in Artificial Intelligence and Machine Learning
  - (iii) BCA with specialization in Data Science
3. Considered and approved the new syllabi of the following courses under Choice Based Credit Scheme (CBCS) from the batch 2022-26 onwards w.e.f the session 2023-24:
  - (i) BCA-2<sup>nd</sup> year (3<sup>rd</sup> Sem. & 4<sup>th</sup> Sem.)
  - (ii) BCA-2<sup>nd</sup> year (3<sup>rd</sup> Sem. & 4<sup>th</sup> Sem.) with specialization in Artificial Intelligence and Machine Learning
  - (iv) BCA-2<sup>nd</sup> year (3<sup>rd</sup> Sem. & 4<sup>th</sup> Sem.) with specialization in Data ScienceThe scheme & syllabi of 2<sup>nd</sup> year would remain the same for BCA, BCA with specialization in Artificial Intelligence & Machine Learning and BCA with specialization in Data Science.
4. Considered and approved the new syllabi of the MCA-2<sup>nd</sup> year (3<sup>rd</sup> Sem. & 4<sup>th</sup> Sem.) under Choice Based Credit Scheme (CBCS) from the batch 2022-24 onwards w.e.f the academic session 2023-24.
5. Considered and approved the new syllabi of MP-02: Computer Applications of Ph.D Course Work w.e.f the academic session 2023-24.
6. Considered and approved the syllabi of the value added course VA-MCA-05: Mining and Analysis of Big Data w.e.f the session 2023-24.
7. Considered and approved the list of MOOC subjects for BCA & MCA students for the session 2023-24 (Odd Semester) under the category of SWAYAM Courses.



8. Considered and approved the Paper Setters for the following courses:
- BCA/BCA (OL)-1<sup>st</sup> Sem., 2<sup>nd</sup> Sem., 3<sup>rd</sup> Sem. & 5<sup>th</sup> Sem. examinations to be held in December, 2023
  - MCA/MCA (OL)-1<sup>st</sup> Sem. & 3<sup>rd</sup> Sem. examinations to be held in December, 2023
  - Ph.D Course Work examinations to be held in December, 2023/January, 2024
9. Considered and approved the synopsis & supervisor of the following Ph. D research scholars:

Sr. No.	Name of Scholar	Name of Supervisor	Title of Synopsis	Date of Approval (RAC)
1.	Shivani Gupta (21-Ph.D-109)	Dr. Pooja Rani	Design a Model for Detection of Fungal Diseases in Apple plants using Machine Learning	06.05.2023
2.	Sunil Kumar (22-Ph.D-117)	Dr. Pooja Rani	Development of An AI-based Model for Prediction of Liver Disease	17.06.2023
3.	Narender Jangra (22-Ph.D-118)	Dr. Rattan Pal Singh Rana	Design a Vulnerability Assessment Model to Enhance the Security of IoT Devices	17.06.2023
4.	Ritika (22-Ph.D-116)	Dr. Dalip, Assoc. Professor	Develop a Framework for Handwritten Signature Verification using Deep Learning	07.07.2023

10. Based on the benchmarking and feedback on Curriculum from various stakeholders for the session 2022-23, the following changes has been incorporated in the syllabi of BCA-2<sup>nd</sup> year & MCA-2<sup>nd</sup> year:

Sr. No.	Course Code	Nomenclature	%age of Change
1.	MCA-301	Programming with Python	20%
2.	MCA-302	Cloud Computing	30%
3.	MCA-304 (b)	Mobile Application Development	25%
4.	MCA-304 (c)	NoSQL Database	100%
5.	MCA-305 (b)	Software Project Management	20%
6.	MCA-402	Open Source Technologies using PHP	50%
7.	MCA-403 (a)	Blockchain Technology	60%
8.	MCA-403 (c)	Design and Analysis of Algorithms	40%
9.	MCA-404 (c)	Internet of Things	30%
10.	BCA-301	Database Management System	20%
11.	BCA-302	Web Designing Fundamentals	40%
12.	BCA-403	Operating System	25%
13.	BCA-404	Software Engineering	40%
14.	MAN-001	Indian Constitution	100%

11. Considered and approved the Panel of examiner for the evaluation of Ph.D thesis of Mr. Nippun Kamboj, Regn. No. 15-Ph.D-042 under the supervision of Dr. Dalip.
12. Considered and approved the Vision, Mission of the Institute, Program Outcomes (PO), Program Specific Outcomes (PSOs) and Program Educational Objectives (PEOs) of MCA programme.
13. Considered and approved the revised syllabus of Environmental Education (EnE-101) as prescribed by UGC-2023 w.e.f the session 2023-24.



14. The weightage of continuous assessment (internal marks) and summative assessment (end semester examination) for Theory and Practical courses of BCA/MCA online programme would be 30 and 70 respectively.

The meeting ended with a vote of thanks.




**-Sd-  
Chairman  
Board of Studies**

Endst. No. MMITBMBOS/2023/133

Dated: 08.08.2023

**A copy of the above is forwarded to the following for information & necessary action:**

1. Controller of Examinations, MM(DU)
2. Dean, Faculty of Engineering & Technology, MM(DU)
3. Dean, Academic (Technical), MM(DU)
4. Concerned Members, MMITBMB, MM(DU)
5. Deputy Registrar (Academic), MM(DU)
6. Dr. Sonal Chawla, Professor,  
Dept. of Computer Science & Applications, Punjab University, Chandigarh
7. Mr. Mukesh Gupta, Sr. Manager,  
Mahindra & Mahindra Ltd., Mohali



**Chairman  
Board of Studies 08.08.23**

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**DEPARTMENT OF CSE**

**Curriculum Update wef July, 2023 based on  
Stakeholder's feedback, BOS & External Experts**

Sr. No.	Programme	Subject Code	Subject Name	%age change	Semester & Batch	Suggested By
1	B.Tech	BCSE-674	Openstack	more than 20%	7 <sup>th</sup> CSE (CT&IS) & Batch: 2020-24	Feedback & External Experts
2	B.Tech	BCSE-675	Privacy & Security of Online Media Networks	more than 20%	7 <sup>th</sup> CSE (CT&IS) & Batch: 2020-24	Feedback
3	B.Tech	BCSE-634	Information Security & IPR	more than 20%	7 <sup>th</sup> CSE (CT&IS) & Batch: 2020-24	Feedback & External Experts
4	B.Tech	BCSE-514	Big Data & Analytics	Only Course Objective & Outcomes with minor changes	5 <sup>th</sup> CSE & Batch: 2021-25	Board of members
5	B.Tech	BCSE-	Virtualization & Scheduling	more than 20%	5 <sup>th</sup> CSE (CT&IS) & Batch: 2021-25	Feedback & Board of members
6	B.Tech	Full scheme: 1 <sup>st</sup> to 8 <sup>th</sup> semester	New Specialization: AI & Machine Learning	3 <sup>rd</sup> to 8 <sup>th</sup> semesters	2023-27	AICTE guidelines & Feedback

  
HoD

Head  
Department of Computer  
Science & Engineering  
M. V. Engineering College  
Mullana, Ambala, Haryana  
(Deemed to be University)  
Mullana, Ambala, Haryana-133207



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M. M. Engineering College, Mullana, Ambala

Department of Computer Science & Engineering

Ref. No.: MMEC/CSE/2023/7.1

Date: 05/07/2023

MINUTES of the meeting of the Board of Studies in Computer Science & Engineering department held on 30.06.2023 at 3:30 pm onwards in hybrid (online / offline) mode. The following members had attended this meeting:

1. Dr. Sandip Goyal, Professor & Head, CSE	In-Chair
2. Dr. Neeraj Nehra, Professor, CSE, Thapar University, Patiala	External Expert (Online)
3. Dr. Sandeep Garg, Associate Professor, IIT Roorkee	External Expert (Online)
4. Mr. Vikas Goel, Senior Software Architect, Resolution Life, Australia	Special Invitee (Online)
5. Dr. Vishal Bharti, Professor, CSE	Member
6. Dr. Sanjeev Kumar, Professor, CSE	Member
7. Dr. Rajneesh Kumar, Professor, CSE	Member
8. Dr. Avinash Sharma, Professor, CSE	Member
9. Dr. Amit Bindal, Professor, CSE	Member
10. Dr. Neeraj Mangla, Professor, CSE	Member
11. Dr. Neera Batra, Professor, CSE	Member
12. Dr. Sandhya Bansal, Professor, CSE	Member
13. Dr. Amandeep Kaur, Professor, CSE	Member
14. Dr. Suneet Kumar, Professor, CSE	Member
15. Dr. Kamal Prakash, Professor, CSE	Member
16. Dr. Vaishali Mehta, Professor, CSE	Member
17. Dr. Deepak Dudeja, Professor, CSE	Member
18. Dr. Prachi Garg, Associate Professor, CSE	Member
19. Dr. Neeraj Raheja, Associate Professor, CSE	Member

Agenda items were discussed one by one and following decisions were taken:

- Minutes of meeting of Board of Studies held on 01 May, 2023 were confirmed.
- Panels of paper setters / examiners of all the theory and practical papers for the examination to be held during (Oct / Nov 2023) of the following courses were recommended and as decided the panels of paper setters / examiners will be sent to the Controller of Examinations separately in a confidential cover:
  - i) B. Tech (CSE & its various specializations) - 1<sup>st</sup> / 2<sup>nd</sup> semester.
  - ii) B. Tech. (CSE)-3<sup>rd</sup>, 5<sup>th</sup> & 7<sup>th</sup> semester.
  - iii) B. Tech (CSE with specialization in Data Science) - 3<sup>rd</sup>, 5<sup>th</sup> & 7<sup>th</sup> semester.
  - iv) B. Tech (CSE with specialization in Cloud Technology & Information Security)-3<sup>rd</sup>, 5<sup>th</sup> & 7<sup>th</sup> semester.
  - v) B. Tech (CSE with specialization in Big Data and Analytics) - 3<sup>rd</sup> semester.
  - vi) B. Tech (CSE with specialization in Full Stack Development) - 3<sup>rd</sup> semester.
  - vii) Open elective subjects floated by CSE department in other departments of MMEC.
- B) M. Tech (CSE) - 1<sup>st</sup> semester.
- C) PhD (CSE) - Departmental subjects of course work examination.
- For B. Tech (Computer Sc. & Engineering) (Batch 2020-2024 only), the house considered and approved:
  - Some minor changes in the scheme of 7<sup>th</sup> semester. These changes involve:
    - Subject: (BCSE-518: Compiler Design) is changed to (BCSE-555: Programming Languages).
    - In list of Elective-IV, subject (BCSE-562: Cybersecurity) is replaced by subject (BCSE-634: Information Security and IPR) and a new subject (BCSE-557: Quantum Computing) is added.
    - In list of Elective-V, subject (BCSE-573: Speech & Natural Language Processing) is replaced by subject (BCSE-560: Natural Language Processing) and subject (BCSE-574: Discrete Mathematics) is replaced by subject (BCSE-518: Compiler Design).
    - In list of Open Elective-III, subject (OME: Entrepreneurship and Family Business) is replaced by subject (BECE-550: Internet of Things).
  - As departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects.

Head  
Department of Computer  
Science & Engineering  
M. M. Engineering College  
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05-7-2023

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For B. Tech (Computer Sc. & Engineering with Specialization in Cloud Technology & Information Security) (Batch 2020-2024 only), the house considered and approved:

A) Some minor changes in the scheme of 7<sup>th</sup> semester. These changes involve:

i) Subject: (BCSE-517: Compiler Design) is replaced with (BCSE-634: Information Security and IPR).

ii) In list of Open Elective-III, subject (OME: Entrepreneurship and Family Business) is replaced by subject (BECE-550: Internet of Things).

B) Syllabi for departmental subjects of 7<sup>th</sup> semester. This includes:

i) Modifications (more than 20%) in already existing syllabus: Openstack, Privacy and Security of Online Social Media Networks, Information Security and IPR.

ii) As remaining departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects.

5. For B. Tech (Computer Sc. & Engineering with Specialization in Data Science) (Batch 2020-2024 only), the house considered and approved:

A) Some minor changes in the scheme of 7<sup>th</sup> semester. These changes involve:

i) Subject: (BCSE-517: Compiler Design) is replaced with (BCSE-617: Advanced Machine Learning).

ii) In list of Elective-IV, a new subject (BCSE-561: Blockchain Technology) is added.

iii) In list of elective-V, subject Recommender System is replaced by subject (BCSE-639: Advanced Big Data Analytics).

iv) In list of Open Elective-III, subject (OME: Entrepreneurship and Family Business) is replaced by subject (BECE-550: Internet of Things).

B) As departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects.

6. For B. Tech (Computer Sc. & Engineering) (Batch 2021-2025 onwards), the house considered and approved:

A) Some minor changes in the scheme of 5<sup>th</sup> semester. These changes involve updation in credits of subject Elective-II from 2 to 3 and subject Elective-II Lab is dropped. Total credits remain unaffected.

B) As departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects. Only Course objectives & Course Outcomes of subject BCSE-514 : Big Data & Analytics were approved with some updations.

7. For B. Tech (Computer Sc. & Engineering with Specialization in Cloud Technology & Information Security) (Batch 2021-2025 onwards), the house considered and approved Syllabi for CSE departmental subjects of 5<sup>th</sup> semester. This includes:

i) Modifications (more than 20%) in already existing syllabus: Virtualization & Scheduling.

ii) As remaining departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects.

8. For B. Tech (Computer Sc. & Engineering with Specialization in Data Science) (Batch 2021-2025 onwards), the house considered and approved Syllabi for CSE departmental subjects of 5<sup>th</sup> semester. As departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects.

9. For B. Tech (Computer Sc. & Engineering, Computer Sc. & Engineering with Specialization in Cloud Technology & Information Security, Computer Sc. & Engineering with Specialization in Data Science, Computer Sc. & Engineering with Specialization in Full Stack Development, Computer Sc. & Engineering with specialization in Big Data and Analytics) (Batch 2022-2026 onwards), the house considered and approved Syllabi for CSE departmental subjects of 3<sup>rd</sup> semester. As departmental subjects already existed in the scheme of previous batches with same/different code. So, no need to approve syllabi for these subjects.

10. As per AICTE issued guidelines and suggestions; CSE department has started a new specialization AI & Machine Learning under B. Tech (Computer Sc. & Engineering) course (For Batch 2023-2027 onwards). Entire Scheme (for 1<sup>st</sup> to 8<sup>th</sup> semester) has been approved. Since scheme & syllabus for B.Tech 1<sup>st</sup> year is common for all branches, so 1<sup>st</sup> year syllabi for this specialization will be same as used for other engineering branches.

11. Panel of examiners for the evaluation of PhD thesis of following research scholars were recommended and approved from BoS and will be sent to Controller of Examinations separately in confidential cover:

i) Minakshi Kamboj (Regn. No. 15-PhD-021) entitled, "Secure and Robust Framework for the Management of Cloud Data Centers".

ii) Mr. Zatin Gupta (Regn. No. 09-ECM-1854) entitled, "IoT Based Efficient Approach for Smart Farming".

iii) Ms. Ritu Aggarwal (Regn. No. 11-ECM-1810) entitled, "Meticulous Presaging of Heart Disease using Machine Learning".

iv) Mr. Ravi Kumar Barwal (Regn. No. 18-PhD-042) entitled, "Development of Efficient Data Mining Approaches Using Machine Learning".

v) Ms. Deepti Sharma (Regn. No. 18-PhD-048) on the topic, "An Efficient Breast Cancer Prediction Model Using Machine Learning".

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vi) Ms. Deepika (Regn. No. 17-PhD-061) on the topic, "An Enhanced Secure Integrated Framework for Cloud Environment".

vii) Ms. Vineeta (Regn. No. 19-PhD-022) on the topic, "Efficient Prediction Model for Chronic Kidney Disease Diagnosis Using Machine Learning".

viii) Ms. Usha Devi (Regn. No. 19-PhD-018) on the topic, "Towards Improving Credit Risk Prediction using Machine Learning Approach".

12. Department has also approved the list of courses which can be floated as open elective course to students of other engineering branches during session July – Nov 2023. These subjects already existed in the CSE scheme. So, no need to approve syllabi for these subjects.
13. Considered & approved the SWAYAM / MOOC courses which can be opted by students (Batch 2020-2024, Batch 2021-2025, Batch 2022-2026 and Batch 2023-2027) under the category of Swayam courses. Also list of approved courses can be expanded.
14. Stakeholders feedback report and research output of the department during session Jan – June 2023 was presented before the house. Based on the feedback, new specialization AI & Machine Learning has been started.
15. PhD synopsis of following research scholars were considered and approved by house (as per the mentioned minutes of RAC meetings):

Sr. No.	Name of the Research Scholar	Registration No.	Topic of Thesis	Supervisor	Date of Approval by RAC
1.	Sonu Chawla	21-PhD-100	Fault-Tolerant Task Scheduling in Cloud Computing Environment	Dr. Amandeep Kaur, Professor, CSE Department, MMEC	18.03.2023

16. After discussion on Attainment of POs, PSOs, COs & target level, the house made following decisions regarding setting of target level for continuous improvement for various courses during upcoming session:

For CO Attainment:

- i) Average Percentage >70%: Level 3, Average Percentage ( $\geq 60$  & <70): Level 2, Average Percentage ( $\geq 50$  & <60): Level 1 And Average Percentage (<50): Level 0
- ii) The respective course instructor may recommend any updation in set target levels depending upon course nature with the prior approval of competent authorities.

The house was made aware about the fact that during last semester, these target levels were:

- i) Average Percentage >65%: Level 3, Average Percentage ( $\geq 55$  & <65): Level 2, Average Percentage ( $\geq 50$  & <55): Level 1 And Average Percentage (<50): Level 0

For PO Attainment:

Target level: 65% (For PO1, PO2, PO3, PO5, PO8, PO9, PO11), 60% (For PO4, PO7, PO10, PO12), 50% (For PO6)

The house was made aware about the fact that during last session, these target levels were: 60% (For PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO11), 55% (For PO10, PO12), 50% (For PO6, PO7)

For PSO Attainment:

Target level: 65% (For PSO1, PSO2, PSO4), 60% (PSO3)

The house was made aware about the fact that during last session, these target levels were: 60% (For PSO1, PSO2, PSO3, PSO4).

17. Discussion on level wise mapping of multiple entry & multiple exit as per NEP 2020 was also done.

18. As per the request made by Head (EE department) regarding approval of Subject code & Subject Syllabus for subjects Java Programming Lab and Data Structure Lab (which is going to be floated by EE department in 3<sup>rd</sup> semester & 4<sup>th</sup> semester respectively under Specialization category), the house considered and approved BCSE-580: Java Programming Lab & BCSE-581: Data Structure Lab syllabi for B. tech. (EE) 3<sup>rd</sup> semester & 4<sup>th</sup> Semester respectively w.e.f. July 2023.

19. Also resolved to authorize the HOD / Chairman Board of Studies of Computer Science & Engineering department to recommend the names of paper setters / examiners for any paper of any course taken by Computer Sc. & Engineering department for the examination to be held during session 2023-24 not covered by the panels of paper setters / examiners recommended under item no. 2 or if the names recommended for any paper in the panels already recommended have been exhausted.

The meeting ended with a vote of thanks to all the members especially to the external experts.

Note: This meeting has been conducted using Google meet online platform. External experts attended this meeting in online mode.

HOD/CHAIRMAN

- CC: 1. All Members of the Board of Studies. 2. PA to the Principal. 3. Controller of Examination.  
4. DR (Academic). 5. Head, Electrical engineering Department.



B. Tech. (7<sup>th</sup> Semester)

#(Latent)

(Common for CSE, CSE with Specialization in Cloud Technology &amp; Information Security)

BCSE-634 (Information Security and IPR)

L	T	P	Continuous evaluation	40
3	0	0	End semester exam	60
			Total marks	100
			Credits	3.0

**Course Objectives:**

- To understand the broad set of technical and social aspects of information security.
- To understand the fundamentals of cryptography to preserve Privacy and Authentication services for information security.
- To understand the fundamentals of Smartphone security, Banking, Credit Card and UPI Security.
- To understand the various Cyber Security law and Initiatives in India.
- To acquaint the learners with the essential knowledge of Intellectual Property Rights. (8 Hours)

**Unit-1:****Introduction:** Principle of Information Security, Basic Security Components, Information Security Threats.**Cryptography:** Cryptosystem, Type of Cryptography, Cryptographic Principles, Digital Signature, Algorithms (DES, Breaking DES), Public-Key Algorithms (RSA), PGP.**Key Management:** Diffie-Hellman Key Exchange, Needham Schroeder protocol, PKI. (9 Hours)**Unit-2:****Authentication and Hashing Protocols:** Password based techniques, Kerberos protocol, Realm in Kerberos protocol, Hashing Algorithms: MD5 and SHA-1, Malicious Code: Malicious software and its types, Life cycle of a Computer Virus, Virus Countermeasures.**Mobile Phone Security:** Authentication Authorization and Accounting in GSM phone, Security In CDMA Communication, Online Banking, Credit Card and UPI Security: Online Banking, Mobile Banking Security, Security of Debit and CreditCard, UPI Security. (9 Hours)**Unit-3:****Social Engineering:** Social Engineering, Types of Social Engineering, How Cyber Criminal Works, How to prevent from being a victim of Cyber Crime.**Cyber Security Initiatives in India:** Counter Cyber Security Initiatives in India, Cyber Security Exercise, Cyber Security Incident Handling.**Cyber Security Threat and Prevention Techniques:** Cyber Security Threat Landscape, Emerging Cyber Security Threats, Cyber Security Techniques, Firewall and its type, Firewall Configurations.**IT Security Act and Misc. Topics:** IT Act, Hackers-Attacker, Web Application Security, Digital Infrastructure Security. (10 Hours)**Unit-4:****Introduction to IPR:** Nature of Intellectual Property: Patents, Designs, Trade and Copyright. The IPR tool kit, Copyright: Copyright infringement, Law of Copyrights, Patents: Process of Patenting and Development, Patent searching process, Ownership rights and transfer, Patent Act of India, Design: Design process, Design Act, Cyber Laws and Digital Content Protection.**Course Outcomes:** After completion of this course, the student is able to:

- Understand and analyzed different cryptography algorithms to prevent information security attacks
- Analysis and design of various authentication protocols and attacks on different emerging technology were summarized
- Understand the various ideas about cyber security threats, cybercrime and objective of IT security Act.
- Imbibe the knowledge of Intellectual Property and its protection through various laws and Regulations.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C comprises of 4 questions of 4 marks each, one from each unit. Section D comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books:**

- William Stallings, "Cryptography and Network Security Principles and Practices", Seventh Edition, Pearson.
- W.A. Coklin, G. White, "Principles of Computer Security", Fourth Edition, McGraw Hill, 2016.
- Deborah E. Bouchoux, Intellectual Property the Law of Trademarks, Copyrights, Patents and Trade Secrets, Cengage Learning, 2013.

**Reference Books:**

- Raghu Santanam, M. Sethumadhavan, "Cyber Security, Cyber Crime and Cyber Forensics: Applications and Perspectives" Information Science Reference.
- Pfleeger, Charles P. and Shari L. Pfleeger, "Security in Computing", 4th Edition, Upper Saddle River, NJ: Prentice Hall, 2008.
- <https://www.newhorizons.com/promotions/cybersecurity-ebooks>.

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B. Tech. (Computer Science & Engineering with Specialization in Cloud Technology & Information Security) (old)  
 BCSE-671 (Information Security)

T P  
 0 0

Continuous evaluation 40  
 End semester exam 60  
 Total marks 100  
 Credits 2.0

**Course Objectives:**

- To understand the broad set of technical and social aspects of information security.
- To understand the fundamentals of cryptography to preserve Privacy and Authentication services for information security.
- To understand the fundamentals of Smartphone security, Banking, Credit Card and UPI Security.
- To understand the various Cyber Security law and Initiatives in India.

**Unit-1:**

**Introduction:** Principle of Cyber Security, Basic Security Components, Cyber Security Threats.

**Cryptography:** Cryptosystem, Type of Cryptography, Cryptographic Principles, Digital Signature, Algorithms (DES, Breaking DES), Public-Key Algorithms (RSA), PGP.

**Key Management:** Diffie-Hellman Key Exchange, Needham Schroeder protocol, PKI.

**Unit-2:**

**Authentication and Hashing Protocols:** Password based techniques, Kerberos protocol, Realm in Kerberos protocol, Hashing Algorithms: MD5 and SHA-1, Malicious Code: Malicious software and its types, Life cycle of a Computer Virus, Virus Countermeasures.

**Mobile Phone Security:** Authentication Authorization and Accounting in GSM phone, Security In CDMA Communication.

**Online Banking, Credit Card and UPI Security:** Online Banking, Mobile Banking Security, Security of Debit and Credit Card, UPI Security.

**Unit-3:**

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

**WLAN Security:** Type of WLAN Arch. Wifi Security, Ad hoc Network Security, ARAN and SAR protocols, onion encryption. Security at Server Site.

**Social Engineering:** Social Engineering, Types of Social Engineering, How Cyber Criminal Works, How to prevent for being a victim of cyber crime.

**Unit-4:**

**Cyber Security Initiatives in India:** Counter Cyber Security Initiatives in India, Cyber Security Exercise, Cyber Security Incident Handling, Cyber Security Assurance.

**Cyber Security Threat Landscape and Techniques:** Cyber Security Threat Landscape, Emerging Cyber Security Threats, Cyber Security Techniques, Firewall and its type, Firewall Configurations.

**IT Security Act and Misc. Topics:** IT Act, Hackers-Attacker, Web Application Security, Digital Infrastructure Security, Defensive Programming.

**Course Outcomes:** After completion of this course, the student is able to:

- Differentiate various cyber security threats.
- Design authentication for different application.
- Understand the fundamentals of Smartphone security, Banking, Credit Card and UPI Security.
- Understand the various ideas about security threats, cybercrime and objective of IT security Act

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text/Reference Books:**

- William Stallings, "Cryptography and Network Security Principles and Practices", Seventh Edition, Pearson.
- W.A. Coklin, G. White, "Principles of Computer Security", Fourth Edition, McGraw Hill, 2016.
- Raghu Santanam, M. Sethumadhavan, "Cyber Security, Cyber Crime and Cyber Forensics: Applications and Perspectives" Information Science Reference.
- Pfleeger, Charles P. and Shari L. Pfleeger. "Security in Computing", 4th Edition, Upper Saddle River, NJ: Prentice Hall, 2008.
- <https://www.newhorizons.com/promotions/cybersecurity-ebooks>.



B. Tech. (7<sup>th</sup> Sem) (CSE with Specialization in Cloud Technology & Information Security) (Latent)  
 BCSE-678 (OpenStack)

L T P  
 3 0 0

Continuous evaluation 40  
 End semester exam 60  
 Total marks 100  
 Credits 3.0

**Course Objectives:**

- i) To introduce students to the concepts, processes and practice of decision making at both individual and group levels in relation to the appropriate utilization of the ICT in today's organizations;
- ii) To provide the participants expertise on operation and management of OpenStack Cloud environment
- iii) To provide the participants expertise on establishing a cloud environment by installation, configuration, operation and management of OpenStack.
- iv) Understand the deep fundamental and understanding of the core components needed to build and manage a public or private cloud environment using OpenStack.

**Unit:-1**

**Introduction:** Introduction to Linux, Linux admin commands, Introduction to Cloud, Comparison with Amazon AWS and Rack Space cloud, Other Cloud frameworks, Introduction to OpenStack and its components, Virtualization techniques.

**Unit: -2**

**Compute (Nova):** What is nova, Supported hypervisors Xen, LXC, KVM, Qemu, VMWare, Architecture & features, Control Flow, Building a Platform as a Service using Docker / LXC?

**OpenStack image service (Glance):** What is Glance, supported image formats, Creating, uploading and using an image, Architecture & features, Control flow.

**Unit: -3**

**Software defined storage (Cinder):** What is Cinder, Block Storage properties, Architecture & features, Control flow.

**Software defined storage (Swift):** What is Swift, Object storage properties, Object security, permissions and metadata, Architecture & components, Features, Control flow, Building a Content Delivery Network.

**Unit: -4**

**Software defined networking (Neutron):** What is Neutron, Architecture & features, Control flow, Creating VPN, Open vSwitch, Cloud Security, Cloud security groups, Instance access (SSH Keys), Virtual private clouds, DMZs.

**Identity & Access Management (Keystone):** -RBAC, Users, Roles, Groups, Domains, Projects, **OpenStack dashboard (Horizon):** What is Horizon, Architecture & features, Control flow, Additional components of an OpenStack system.

**Course Outcome:** After completion of this course, students will be able to:

- i) Understand & explain core components needed to build and manage a public or private cloud environment using OpenStack.
- ii) Understand & explain about unique features of OpenStack and how it differs to traditional virtualization.
- iii) Explain about OpenStack services.
- iv) Identity Service (Keystone), COMPUTING(NOVA).
- v) Build and manage a public or private cloud environment using OpenStack.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books:**

1. OpenStack for Architects: Design production-ready private cloud infrastructure, 2nd Edition.
2. Fog Computing Concepts, Frameworks and Technologies, Mahmood, Zaigham (Ed.), Springer, 2018.
3. Cloud computing concepts, technology and Architecture – Thomas Erl, Zaigham Mahmood, Ricardo Puttini, Pearson, 2017.

**Reference Books:**

1. Cloud computing a practical approach - Anthony T. Velte, Toby J. Velte Robert Elsenpeter TMC, New Delhi – 2010.
2. Cloud Data Center: <https://www.emoneyindeed.com/traditional-data-center-vs-cloud-datacenter/>
3. Energy Efficiency: <https://www.geeksforgeeks.org/energy-efficiency-in-cloud-computing/>
4. Cloud Service management: <https://www.includehelp.com/cloudcomputing/cloud-service>.



**B. Tech. (Computer Science & Engineering with Specialization in Cloud Technology & Information Security)**  
**BCSE-674 (OpenStack)**

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0 0

Continuous evaluation 40  
 End semester exam 60  
 Total marks 100  
 Credits 3.0

(Old)

**Course Objectives:**

- To introduce students the concepts, processes and practice of decision making at both individual and group levels in relation to the appropriate utilization of the ICT in today's organizations;
- To provide the participants expertise on operation and management of OpenStack Cloud environment.
  - To provide the participants expertise on establishing a cloud environment by installation, configuration, operation and management of OpenStack.
  - To understand the deep fundamental and understanding of the core components needed to build and manage a public or private cloud environment using OpenStack

**Unit-1: Introduction to Cloud Technology**

Understanding hybrid clouds, What is cloud computing, Basic types of cloud: Public, private, Technologies used by cloud providers, The hybrid cloud: Hybrid cloud architecture, Advantages of a hybrid cloud, Factors to consider before moving to a hybrid cloud, Understanding the DevOps methodology.

**Unit-2: Basics of Cloud Architecture, Virtualization**

Overview of OpenStack, Architecture of OpenStack, project, services, mode of deployment, workflow, Deployment of virtualization environment, Installation and configuration of Virtualization tools (KVM), Deployment of Cloud.

**Unit-3: Installation and configuration of OpenStack**

Installation and configuration of OpenStack, OpenStack APIs, Usage of OpenStack Horizon Dashboard, OpenStack CLI client, Identity management- Manage and create domains, projects, users, and roles, understand the differences between the member and admin roles, create roles for the environment, create and manage policy files and user access rules, create and manage RC files to authenticate with Keystone for command line use.

**Unit-4: Computing API (NOVA)**

Create and manage flavors, create and manage compute instances, generate and manage SSH keys for use when connecting to instances, access an instance using an SSH key, configure an instance with a floating IP address, create instances with security groups, manage Nova host consoles, manage instance snapshots, manage instance quotas

**Course Outcomes:** After completion of this course, the student is able to:

- Have a fundamental understanding of the core components needed to build and manage a public or private cloud environment using OpenStack.
- Learn what makes OpenStack unique as cloud architecture and how it differs to traditional virtualization.
- Conceptually explain OpenStack services.
- Identity Service (Keystone), COMPUTING (NOVA).
- Build and manage a public or private cloud environment using OpenStack.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text/Reference Books:**

- OpenStack for Architects: Design production-ready private cloud infrastructure, 2nd Edition.
- Mastering OpenStack by Khedher, Omar Packt Publishing.
- OpenStack Essentials by Dan Radez 2<sup>nd</sup> Edition Packt Publishing.
- OpenStack Cloud Computing Cookbook by Kevin Jackson, 4<sup>th</sup> Edition, Packt Publishing.

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B. Tech. (7<sup>th</sup> Sem) (CSE with Specialization in Cloud Technology & Information Security)

## BCSE-681 (Privacy and Security of Online Social Media Networks)

L	T	P
3	0	0

Continuous evaluation	40
End semester exam	60
Total marks	100
Credits	3.0

**Course Objectives:**

1. Understand fundamental of Online Social Media Networks.
2. Understand the architecture of security of cloud computing.
3. Understand different protocols for security of online cloud computing platforms.
4. Understand different types of Security and its risk factors.

**Unit:-1 Online Social Media Networks**

(9 Hours)

Introduction of Online Social Networks, data collection from social networks and its need. Social Media Data & its Analysis (Tools and methods) . challenges, opportunities, and pitfalls in online social media networks. APIs . Trust, credibility, and reputations in social systems, Online social Media and Policing Information privacy disclosure, revelation and its effects in OSM and online social networks Phishing in OSM & Identifying fraudulent entities in online social networks

**Unit:-2 Social Media Security**

(9 Hours)

Introduction, Common security risks affecting social media, Social Media Security Tips for individual users, Social Media Security Tips for Businesses, Issues Involving Cybersecurity For Social Media, Risks & Challenges, Solutions On Social Media Threats

**Unit:-3 Cloud Security**

(9 Hours)

Security Overview, Cloud Security Challenges and Risks, Software-as-a-Service Security, Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Data Security, Application Security, Virtual Machine Security, Identity and Presence, Identity Management and Access Control, Secure Execution Environments and Communications. . Autonomic Security Storage Area Networks, Disaster Recovery in Clouds

**Unit:-4 Privacy & its Laws**

(9 Hours)

Security Services, Security Attacks and Security Mechanisms, Symmetric Cipher Model, Cryptography and Cryptanalysis, Types of Cryptography, Substitution and Transposition techniques. Social Media & Data Breaches, Security threat in Social Media Accounts. Types of Security Threats, Overview of Lawful Social Media Monitoring, Understanding personal Privacy, Privacy & its Law, Shortcoming of Social Media Password Protection Law.

**Course Outcomes:**

- i) Student achieve proficiency in concepts of cloud computing.
- ii) Students demonstrate ability to design, implement a cloud based architecture for shifting the application from on premise to cloud.
- iii) Students demonstrate ability in applying their major knowledge to practical applications of companies.
- iv) Students demonstrate ability in designing architecture for cloud.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books:**

1. Cloud Computing: Concepts, Technology & Architecture, Ricardo Puttini, Thomas Erl, and Zaigham Mahmood.
2. Identity and Access Management: Business Performance Through Connected Intelligence, Ertem Osmanoglu.
3. Mastering Cloud Computing, Rajkumar Buyya, Christian Vacchiola, S Thamarai Selvi, McGraw Hill 2013.

**Reference Books:**

1. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly 2010
2. Cloud Computing: Web-based Applications that change the way you work and collaborate online, Michael Miller, Pearson Education 2008



B. Tech. (Computer Science & Engineering with Specialization in Cloud Technology & Information Security)  
 BCSE-675 (Security and Privacy of Online Social Media Networks)

T P  
 0 0

Continuous evaluation 40  
 End semester exam 60  
 Total marks 100  
 Credits 3.0

(22d)

**Course Objectives:**

- Understand fundamental of Online Social Media Networks.
- Understand the architecture of security of cloud computing.
- Understand different protocols for security of online cloud computing platforms.
- Understand different types of Security and its risk factors.

**Unit-1: Online Social Media Networks**

Introduction of Online Social Networks, data collection from social networks and its need, Social Media Data & its Analysis (Tools and methods), challenges, opportunities, and pitfalls in online social media networks, APIs, Trust, credibility, and reputations in social systems, Online social Media and Policing. Information privacy disclosure, revelation and its effects in OSM and online social networks. Phishing in OSM & Identifying fraudulent entities in online social networks

**Unit-2: Social Media Security**

Introduction, Common security risks affecting social media, Social Media Security Tips for individual users, Social Media Security Tips for Businesses, Issues Involving Cybersecurity for Social Media, Risks & Challenges, Solutions on Social Media Threats.

**Unit-3: Cloud Security**

Security Overview, Cloud Security Challenges and Risks, Software-as-a-Service Security, Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Data Security, Application Security, Virtual Machine Security, Identity and Presence, Identity Management and Access Control, Secure Execution Environments and Communications, Autonomic Security Storage Area Networks, Disaster Recovery in Clouds

**Unit-4: Security Protocols**

Security Services, Security Attacks and Security Mechanisms, Symmetric Cipher Model, Cryptography and Cryptanalysis, Types of Cryptography, Substitution and Transposition techniques. Stream Ciphers and Block Ciphers Block Cipher structure, Data Encryption standard (DES) with example, strength of DES, Design principles of block cipher, AES, RSA algorithm, its computational aspects and security, Diffie-Hillman Key Exchange algorithm, Man-in-Middle attack.

**Course Outcomes:**

- Student achieve proficiency in concepts of cloud computing.
- Students demonstrate ability to design, implement cloud based architecture for shifting the application from on premise to cloud.
- Students demonstrate ability in applying their major knowledge to practical applications of companies.
- Students demonstrate ability in designing architecture for cloud.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text/Reference Books:**

- Cloud Computing: Concepts, Technology & Architecture, Ricardo Puttini, Thomas Erl, and Zaigham Mahmood.
- Identity and Access Management: Business Performance Through Connected Intelligence, Ertem Osmanoglu.
- Mastering Cloud Computing, Rajkumar Buyya, Christian Vacchiola, S Thamarai Selvi, McGraw Hill 2013.
- Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly 2010
- Cloud Computing: Web-based Applications that change the way you work and collaborate online, Michael Miller, Pearson Education 2008.

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B. Tech. (5<sup>th</sup> Sem) (CSE with specialization in Cloud Technology & Information Security) # ~~Text~~ >  
 BCSE-653 (Virtualization & Scheduling)

L T P  
2 0 0

Continuous evaluation 40  
 End semester exam 60  
 Total marks 100  
 Credits 2.0

**Course Objectives:**

1. To understand about Computing Virtualization tools, applications and techniques.
2. To understand Server Virtualization and Virtualization Platform.
3. To understand the technologies of Virtualization and Network Virtualization.
4. To understand the concepts of Cloud resource management.
5. To study the concept of scheduling in virtualized cloud computing environment.

**Unit-1**

**Introduction to Virtualization:** Virtualization and cloud computing - Need of virtualization, limitations. Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization, Desktop virtualization, Software virtualization, Memory virtualization, Storage virtualization, Data virtualization, Network virtualization

**Hypervisors and Virtual machines:** Server Virtualization: Understanding Server Virtualization, types of server virtualization, Virtual machine basics, types of virtual machines, hypervisor concepts and types

**Containerization and Virtualization:** Introduction to containerization technology (e.g., Docker), Comparison of containers and virtual machines, Integration of containers with virtualized infrastructure

**Unit-2**

**Virtualization Infrastructure:** Virtualization layers and components in cloud environments, Virtual machine monitors (VMMs) and virtualization management tools, Virtual Machine (VM) Provisioning and Management

**Virtual machines:** Basics of VMWare, advantages of VMWare virtualization, using Vmware workstation, creating virtual machines- understanding virtual machines, create a new virtual machine on local host, cloning virtual machines, virtualize a physical machine, starting and stopping a virtual machine, Techniques to design virtualization machine monitors, memory virtualization techniques, I/O virtualization techniques.

**Attacks on the Virtual Machine:** Delete the VM, attack on the control of the VM, code or file injection into the virtualized file structure, VM migration attack.

**Unit-3**

**Scheduling Fundamentals:** Basics of task scheduling in distributed systems, Challenges and requirements specific to cloud environments, Types of Scheduling in Cloud Computing: Job scheduling: managing user requests and allocating resources, Task scheduling: distributing tasks across available resources, Data scheduling: optimizing data placement and movement.

**Scheduling Algorithms and Policies:** First-Come-First-Serve (FCFS) and Round Robin (RR) scheduling, Priority-based scheduling and deadline-driven scheduling, Load balancing techniques for efficient resource utilization

**Virtual Machine (VM) Scheduling:** VM placement and migration strategies, Dynamic VM provisioning and scaling, Overbooking and consolidation techniques, **Container Scheduling:** Introduction to containerization and orchestration frameworks, Container scheduling algorithms (e.g., Kubernetes scheduling policies) **Workflow Scheduling:** Managing complex workflows in cloud environments, Workflow representation and mapping onto available resources, Workflow scheduling optimization techniques

**Unit-4**

**Scheduling:** Overview of scheduling problem, different types of scheduling: Static Scheduling, Dynamic Scheduling, Centralized, Distributed/ Decentralized, Preemptive, Non-preemptive, Co-operative, Batch mode. Phases of Scheduling, Scheduling algorithms in cloud computing environment, scheduling for independent and dependent tasks, static vs. dynamic scheduling, optimization techniques for scheduling. Scheduling algorithms for computing clouds, fair queuing, start time fair queuing, Cloud scheduling subject to deadlines.

**Performance Evaluation and Optimization:** Metrics for measuring scheduling performance, Simulation and modeling of scheduling algorithms, Techniques for optimizing scheduling efficiency and resource utilization **Scheduling in Big Data and Stream**

**Processing:** Challenges and techniques for scheduling big data analytics tasks, Real-time stream processing and scheduling strategies, **Scheduling in Serverless Computing:** Overview of serverless computing models, Scheduling and scaling functions in serverless architectures, Optimization techniques for serverless workload management, **Security and Fault-Tolerance in Scheduling:** Security considerations in scheduling algorithms, Fault-tolerant scheduling strategies and resiliency mechanisms,

**Research Trends and Future Directions:** Emerging research topics in cloud scheduling, Latest advancements and industry trends in scheduling techniques.

**Course Outcomes:** After learning the course, the students will be able to:

1. Understand Virtual machines and Implementation of virtual machines.
2. Understand virtualization and various ways of using virtualization.
3. Understand the scheduling process in virtualized cloud computing environment.
4. Understand the cloud resource management mechanism.
5. Understand of Cloud scheduling architecture.

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 Mahatma Jyotiba Phule  
 (Deemed to be University)  
 Mullana, Ambala



B. Tech. (5<sup>th</sup> Sem) (CSE with specialization in Cloud Technology & Information Security) (Old)  
 BCSE-653 (Virtualization & Scheduling)

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Continuous evaluation	40
End semester exam	60
Total marks	100
Credits	2.0

**Course Objectives:**

1. To understand about Computing Virtualization tools, applications and techniques.
2. To understand Server Virtualization and Virtualization Platform.
3. To understand the technologies of Virtualization and Network Virtualization.
4. To understand the concepts of Cloud resource management.
5. To study the concept of scheduling in virtualized cloud computing environment.

**Unit:-1**

**Introduction to Virtualization:** Virtualization and cloud computing - Need of virtualization, limitations. Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization, Desktop virtualization, Software virtualization, Memory virtualization, Storage virtualization, Data virtualization, Network virtualization

**Hypervisors and Virtual machines:** Server Virtualization: Understanding Server Virtualization, types of server virtualization, Virtual machine basics, types of virtual machines, hypervisor concepts and types

**Unit:-2**

**Virtual machines:** Basics of VMWare, advantages of VMware virtualization, using VMware workstation, creating virtual machines - understanding virtual machines, create a new virtual machine on local host, cloning virtual machines, virtualize a physical machine, starting and stopping a virtual machine, Techniques to design virtualization machine monitors, memory virtualization techniques, I/O virtualization techniques.

**Attacks on the Virtual Machine:** Delete the VM, attack on the control of the VM, code or file injection into the virtualized file structure, VM migration attack.

**Unit:-3**

**Cloud Resource Management:** Policies and mechanisms for resource management, Applications of control theory to task scheduling on a cloud, Stability of a two level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers, A utility-based model for cloud based web services, Resource bundling, combinatorial auctions for cloud resources. Management and Dynamic Application Scaling

**Unit:-4**

**Scheduling:** Overview of scheduling problem, different types of scheduling: Static Scheduling, Dynamic Scheduling, Centralized, Distributed/ Decentralized, Preemptive, Non-preemptive, Co-operative, Batch mode. Phases of Scheduling, Scheduling algorithms in cloud computing environment, scheduling for independent and dependent tasks, static vs. dynamic scheduling, optimization techniques for scheduling. Scheduling algorithms for computing clouds, fair queuing, start time fair queuing, Cloud scheduling subject to deadlines.

**CloudSched architecture and main features.** Performance metrics for different scheduling algorithms Status and trends of cloud computing, Design and implementation of CloudSched, Performance evaluation.

**Course Outcomes:** After learning the course, the students will be able to:

1. Understand Virtual machines and Implementation of virtual machines.
2. Understand virtualization and various ways of using virtualization.
3. Understand the scheduling process in virtualized cloud computing environment.
4. Understand the cloud resource management mechanism.
5. Understand of Cloud scheduling architecture.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books/Reference Books:**

1. Mastering Cloud Computing, Raj Kumar Buyya, Christian Vacchiola, S Thamarai Selvi, McGraw Hill 2013.
2. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly 2010.
3. Cloud Computing: Web-based Applications that change the way you work and collaborate online, Michael Miller, Pearson Education 2008.

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 Department of Computer  
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 Mullana, Ambala  
 (Haryana)



B. Tech. (5<sup>th</sup>Sem) (Common for CSE, CSE with Specialization in Data Science)  
 BCSE-514 (Big Data & Analytics)

(Latent)

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Continuous evaluation	40
End semester exam	60
Total marks	100
Credits	2.0

**Course Objectives:**

1. To study the basic technologies that forms the foundations of Big Data.
2. To study the programming aspects of cloud computing with a view to rapid prototyping of complex applications.
3. To understand the specialized aspects of big data including big data application, and big data analytics.
4. To study different types Case studies on the current research and applications of the Hadoop and big data in industry.

**Unit:-1**

**Big Data:** Introduction to Big Data Platform, Challenges of Conventional Systems, Data Types (Structured, Semi-Structured and Unstructured), Traditional BI vs Big Data Environment, Big Data (Descriptive, Predictive and Prescriptive), Big Data Technology Landscape (SQL, NoSQL, NoSQL Databases, New SQL), CAP Theorem, Hadoop installation (standalone modes and fully distributed mode).

**Unit:-2**

**Hadoop:** Introduction, key advantages of Apache Hadoop, Hadoop vs. RDBMS, Hadoop Architecture, Hadoop components, HDFS Design and goals, anatomy of file read and write in HDFS, Replica placement strategy, Working with HDFS Commands, Hadoop file system interfaces, Hadoop 1.0 vs Hadoop 2.0, Hadoop Echo System.

**Data Streaming:** Data streaming, Data Flow, Models, Flumes (Features, Architecture).

**Unit:-3**

**Map Reduce:** Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features, SQL vs. Map Reduce, Stream Data Model and Architecture.

**Unit:-4**

**PIG:** Introduction, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.

**Hive:** Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

**Hbase:** HBase Basics, Concepts, Clients, Example, Zookeeper, Hbase vs. RDBMS. Big SQL.

**Sqoop:** Sqoop Architecture, Installation, connectors & drivers, importing and exporting data from HDFS, HIVE, Hbase.

**Course Outcomes:**

1. Understand and explain the building blocks of Big Data.
2. Articulate the programming aspects of cloud computing (map Reduce etc).
3. Explain about recent research trends related to Hadoop File System, MapReduce and Google File System etc.
4. Explain the specialized aspects of big data with the help of different big data applications.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books:**

1. Tom White, "Hadoop: The Definitive Guide", 3<sup>rd</sup> ed., O'reilly Media, 2012.
2. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGraw-Hill Publishing, 2012.
3. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley.

**Reference Books:**

1. Glenn J. Myatt, "Making Sense of Data", John Wiley & Sons.
2. Pete Warden, "Big Data Glossary", O'Reilly, 2011.

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**MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY)**  
**MULLANA-AMBALA, 133207 HARYANA (INDIA)**  
 (Established under Section 3 of the UGC Act. 1956)  
 (Accredited By NAAC With Grade A++)

Committee Name : Curriculum Update      Dept. Name : Computer Science & Engineering      Institute Name :

S.No.	Year	Programme	Programme Code	Breif detail of the update	Percentage change in the course	Approved By	Suggested By	Applicable From
1	2022	B.Tech	BCSE-534	As per teachers feedback some new topics has been added	22	BoS	Others	July 2022
2	2022	B.Tech	BCSE-534L	As per feedback of teacher list of experiments is updated	22	BoS	Others	July 2022
3	2022	B.Tech	BCSE-671	New subject is introduced	100	BoS	Others	July 2022
4	2022	B.Tech	BCSE-674	Syllabus approved for the first time.	100	BoS	Others	July 2022
5	2022	B.Tech	BCSE-675	Syllabus approved for the first time.	100	BoS	Others	July 2022
6	2022	B.Tech	BCSE-617 Advanced Machine Learning	Syllabus approved for the first time.	100	BoS	Others	July 2022
7	2022	B.Tech	BCSE-623 Predictive Analysis using Python	Syllabus approved for the first time.	100	BoS	Others	July 2022
8	2022	B.Tech	BCSE-531 PHP and its Framework	New subject is introduced.	100	BoS	Industry Experts	July 2022
9	2022	B.Tech	BCSE-531L PHP and its Framework Lab.	New subject lab is introduced.	100	BoS	Industry Experts	July 2022
10	2022	B.Tech	BCSE-542 UI UX Design	Syllabus approved for the first time.	100	BoS	Industry Experts	July 2022
11	2022	B.Tech	BCSE-652 Linux Administration	Syllabus approved for the first time.	100	BoS	Others	July 2022

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**Mullana, Ambala, Haryana-133207**

S.No.	Year	Programme	Programme Code	Breif detail of the update	Percentage change in the course	Approved By	Suggested By	Applicable From
12	2022	B.Tech	BCSE-652L Linux Administration Lab	Syllabus approved for the first time.	100	BoS	Others	July 2022
13	2022	B.Tech	BCSE-612L Optimization Techniques Lab	Syllabus approved for the first time.	100	BoS	Others	July 2022
14	2022	B.Tech	HSMC-051 Universal Human Values	New subject is introduced as per AICTE guideline.	100	BoS	Others	July 2022
15	2022	B.Tech	BCSE-005 IT Skills for Business	New subject is introduced.	100	BoS	Others	July 2022
16	2022	B.Tech	Full Stack Development	A new specialization is started in CSE dept.	100	BoS	Board Members	July 2022
17	2022	B.Tech	Big Data and Analytics Specialization	A new specialization is started in CSE dept.	100	BoS	Board Members	July 2022

*Signature*

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(Deemed To Be University)  
Muradpur, Ambikapur, Bhopal-461007



B.Tech (6th) (Computer Science & Engineering)  
BCSE-539 (Javascript & its Framework)

L	T	P	Continuous evaluation	40
3	0	0	End semester exam	60
			Total marks	100
			Credits	3.0

Course Objectives:

- Introduction to what is React and its basic concepts.
- Learn what is JSX and how it works behind the scenes.
- Learn what are the stateful and stateless components and when to use them
- Working with function based and class based components.
- Working with React Modules, importing and exporting the modules.
- Learn in detail about how the render method works.
- React component lifecycle and different lifecycle methods.
- Creating dynamic websites with help of re-usable components.
- Creating a proper working structure for a project from scratch which will help maintaining the project for long term.

Unit:-1

**HTML:** Tags- header, list, table, image, audio & video. **CSS3:** colors, box model, Psuedo-classes, Pseudo-elements, Transitions, and Positioning. **Bootstrap4:** Buttons, Tables, Images. **Introduction to Javascript:** Variables, Control Statements, Functions, Arrays, Objects, Strings & Manipulations – Handling Events – **Ajax:** The Basics, XMLHttpRequest, JavaScript and XML.

Unit:-2

**Introduction to Node.js** – Setting up Node.js and NPM, **Introduction to React** – Virtual DOM, React element, ReactDOM, React Components – createClass, ES6 Class, Stateless functional Components, DOM Rendering, React element as JSX, Props – Default props, component states.

Unit:-3

**React lifecycle and react route:** Lifecycle Methods - Mounting, Updating and Unmounting, Forms, Handling Events, Refs, Lists and Keys, React Strap – Link, Nav, Card, React Route – Switch, Route and Redirect, Flux architecture, Animations using ReactJs.

Unit:-4

**JSON Server with Reactjs:** Networking concepts – Client and Server, HTTP, JSON – Creating the JSON file, Setting up REST API using JSON Server, JavaScript library integration, Making requests with Fetch.

Course Outcomes:

- Be familiar with client-side Javascript application development and the React library.
- Be able to implement single page applications in React.
- Be able to use various React features including components and forms.
- Be able to implement a functional front-end web application using React.
- Be able to set-up a JSON Server and Fetch data into the webpage.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

Text Books:

- Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013.
- DT Editorial Services, "HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery", Dreamtech Press, 2 editions, October 2016.

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3. Alex Banks and Eve Porcello, "Learning React: Functional Web development with React and Redux", Published by O'Reilly, 1st Edition, 2017.
4. Brown, Ethan, "Web Development with Node and Express: Leveraging the JavaScript Stack", O'Reilly Media, 2019.

**Reference Books:**

1. David Flanagan, "JavaScript: The Definitive Guide, Sixth Edition", O'Reilly Media, 2011.
2. Lionel Lopez, "React: Quickstart Step-By-Step Guide To Learning React JavaScript Library (React.js, Reactjs, Learning React JS, React Javascript, React Programming)", Kindle Edition
3. Krishna Rungta, "Learn NodeJS in 1 Day: Complete Node JS Guide with Examples", Kindle Edition

  
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**M.M. (DEEMED TO BE UNIVERSITY) , MULLANA (AMBALA)**

**B.Tech (6th) (Computer Science & Engineering)  
BCSE-545 (Javascript & its Framework Lab)**

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Continuous evaluation 60  
End semester exam 40  
Total marks 100  
Credits 1.0

**Course Objectives:**

- i) Use a JavaScript package manager (npm).
- ii) Understand the new JavaScript language features, including classes, modules, and arrow functions.
- iii) Articulate what React is and why it is useful.
- iv) Explore the basic architecture of a React application.
- v) Gain a deep understanding of JSX and the Virtual DOM.

**LIST OF PROGRAMS:**

1. Create an Event Registration HTML page with CSS3 components.
2. Create an online shopping page using Bootstrap components.
3. Create a web page with JS to validate age (onblur event) greater than 18 and count the no of words in the description field (onclick event).
4. Create a web page to display the contents of XML in a tabular format.
5. Build simple React components that implement a render () method, which takes input data and returns data to display. Use an XML-like syntax called JSX. Input data, passed into the component can be accessed by render () via this.props.
6. Create a JSON file, which has students details such as register number, name, department and display the same in react Component using the map function.
7. Create a simple web page, with navigation links for AboutUs page and ContactUs page. Implement the same using React Route concepts.
8. Create a simple application with "Enter and leave animations". The animations are used when user want to add or remove elements from the list.
9. Create a react application, using which the details of "Restaurant: - Dish ID, Image of the Dish, Comments of the dish and Description" are fetched from the JSON server and displayed on the web page.

**Project Topics:** The following applications have to develop using the ReactJS library:

**1. Personal Blog**

**Objective(s):** To create a simple blog website that allows users to add new articles and edit and delete articles.

**Project Overview:** At the front-end of the blog, users should add new articles and view, edit, and delete articles. You will also have to develop the backend for the app that will handle all the blog data. You can use Node.js to develop the backend of the blog.

**2. Social Media App**

**Objective(s):** To build a social media app with several basic features common among the leading social media platforms like Facebook and Twitter.

**Project Overview:** This project requires you to build a social media app inspired by the leading social media platforms, namely Facebook and Twitter. Your social media app should have some of the basic features that should have include user authentication, user profiles, feeds, notifications, and post interactions.

You need to build several components to make your social media app work. You can also use a database to store all the data, including username & passwords, image uploads, and profile data.

**Course Outcomes:** Upon completion of this course, the students will be able:

- i) To build dynamic websites with help of re-usable components.
- ii) To create a proper working structure for a project from scratch this will help maintaining the project for long term.

  
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**B. Tech. (5<sup>th</sup> Semester)**  
 (Common for CSE, CSE with Specialization in Data Science, CSE with specialization in Cloud Technology & Information Security)  
**BCSE-534 (JavaScript & Its Framework)**

L	T	P	Continuous evaluation	60
3	0	0	End semester exam	40
			Total marks	100
			Credits	3.0

**Course Objectives:**

1. Introduction to what is React and its basic concepts.
2. Learn what JSX is and how it works behind the scenes.
3. Learn what are the stateful and stateless components and when to use them.
4. Working with function based and class based components.
5. Working with React Modules, importing and exporting the modules.
6. Learn in detail about how the render method works.
7. React component lifecycle and different lifecycle methods.
8. Creating dynamic websites with help of re-usable components.
9. Creating a proper working structure for a project from scratch which will help maintaining the project for long term.

(9 Hours)

**Unit:-1**

**Introduction to Javascript:** Variables, Control Statements, Functions, Arrays, Objects, Strings & Manipulations – Handling Events. **Emerging JavaScript:** Declaring Variables in ES6 - Const, Let. Template Strings, Default Parameters, Arrow Functions, Transpiling ES6, ES6 Objects and Arrays - Destructuring Assignment, Object Literal Enhancement, and Spread Operator. ES6 Modules, Promises, Classes.

(9 Hours)

**Unit:-2**

**Introduction to Node.js:** Setting up Node.js and NPM, **Introduction to React:** Virtual DOM, React element, ReactDOM, React Components – createClass, ES6 Class, Stateless functional Components, DOM Rendering, React element as JSX, Props – Default props, component states. **React Lifecycle Methods:** Mounting, Updating and Unmounting, Forms, Handling Events, Refs, Lists and Keys.

(9 Hours)

**Unit:-3**

**Hooks:** State Hook, Effect Hook, Rules of Hooks and Building your own Hooks. **React Strap:** Link, Nav, and Card. **React Route:** BrowserRouter, Routes, Route and Link, **React Flux:** Basic concepts, Flux architecture. **React Redux:** Redux Concepts and Data Flow, State, Actions, and Reducers, Store, Integrating Redux with a UI.

(9 Hours)

**Unit:-4**

**JSON Server with Reactjs:** Networking concepts – Client and Server, HTTP, JSON – Creating the JSON file, Setting up REST API using JSON Server, JavaScript library integration, Making requests with Fetch.

**Course Outcomes:**

1. Be familiar with client-side Javascript application development and the React library.
2. Be able to implement single page applications in React.
3. Be able to use various React features including components and forms.
4. Be able to implement a functional front-end web application using React.
5. Be able to set-up a JSON Server and Fetch data into the webpage.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books:**

1. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013.
2. DT Editorial Services, "HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery", Dreamtech Press, 2 editions, October 2016.
3. Alex Banks and Eve Porcello, "Learning React: Functional Web development with React and Redux", Published by O'Reilly, 1st Edition, 2017.
4. Brown, Ethan, "Web Development with Node and Express: Leveraging the JavaScript Stack", O'Reilly Media, 2019.

**Reference Books:**

1. David Flanagan, "JavaScript: The Definitive Guide, Sixth Edition", O'Reilly Media, 2011.
2. Lionel Lopez, "React: Quickstart Step-By-Step Guide To Learning React JavaScript Library (React.js, Reactjs, Learning React JS, React Javascript, React Programming)", Kindle Edition.
3. Krishna Rungta, "Learn NodeJS in 1 Day: Complete Node JS Guide with Examples", Kindle-Edition.



**B. Tech. (5<sup>th</sup> Semester)**  
 (Common for CSE, CSE with Specialization in Data Science, CSE with specialization In Cloud Technology & Information Security)  
**BCSE-534L (Javascript & its Framework Lab)**

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Continuous evaluation	60
End semester exam	40
<b>Total marks</b>	<b>100</b>
Credits	2.0

**Course Objectives:**

1. Use a JavaScript package manager (npm).
2. Understand the new JavaScript language features, including classes, modules, and arrow functions.
3. Articulate what React is and why it is useful.
4. Explore the basic architecture of a React application.
5. Gain a deep understanding of JSX and the Virtual DOM.

**LIST OF PRACTICAL:**

1. Create a web page with JS to validate age (onblur event) greater than 18 and count the no of words in the description field (onclick event).
2. Build simple React components that implement a render () method, which takes input data and returns data to display. Use an XML-like syntax called JSX. Input data, passed into the component can be accessed by render () via this.props.
3. Create a simple counter app in React with stateful Component.
4. Create a Todo List app with React components that allows users to add, edit, view and delete tasks.
5. Create a JSON file, which has students details such as register number, name, department and display the same in react Component using the map function.
6. Create an Event Registration form with React Strap components.
7. Create an online shopping page with React components that will consist in a Navigation Bar at the top of the page, a Main section in the middle that will contain all the shopping item's information, and a Footer at the bottom of the page with a little information about the page, like social network icons and the copyright information.
8. Create a simple web page, with navigation links for AboutUs page and ContactUs page. Implement the same using React Route concepts.
9. Create a react application, using which the details of "Restaurant - Dish ID, Image of the Dish, Comments of the dish and Description" are fetched from the JSON server and displayed on the web page.

**Project Topics:** The following applications has to develop using the ReactJS library

**1. Personal Blog**

**Objective(s):** To create a simple blog website that allows users to add new articles and edit and delete articles.

**Project Overview:**

At the front-end of the blog, users should add new articles and view, edit, and delete articles. You will also have to develop the backend for the app that will handle all the blog data. You can use Node.js to develop the backend of the blog.

**2. Social Media App**

**Objective(s):** To build a social media app with several basic features common among the leading social media platforms like Facebook and Twitter.

**Project Overview:**

This project requires you to build a social media app inspired by the leading social media platforms, namely Facebook and Twitter. Your social media app should have some of the basic features that should have include user authentication, user profiles, feeds, notifications, and post interactions.

You need to build several components to make your social media app work. You can also use a database to store all the data, including username & passwords, image uploads, and profile data.

**Course Outcomes:** Upon completion of this course, the students will be able:

1. To build dynamic websites with help of re-usable components.
2. To create a proper working structure for a project from scratch this will help maintaining the project for long term.

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**B. Tech. (Computer Science & Engineering)**  
**BCSE-542 (UI / UX Design)**

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Continuous evaluation	40
End semester exam	60
Total marks	100
Credits	3.0

**Course Objectives:** To provide students with the knowledge of :

- i) User-centered design.
- ii) User-centered methods in design.
- iii) Usability testing methods, interface technologies and user centered design in corporate perspective.
- iv) Wireframing and Prototyping software in the various UI/UX Design tools.

**Unit:-1 Introduction to UI**

Overview of UI & UX Design, Overview of the UX Design Process, Difference between User Interface (UI) vs User Experience (UX), The Relationship Between UI and UX , Roles in UI / UX, A Brief Historical Overview of Interface Design, Interface Conventions, Approaches to Screen Based UI, Template vs Content, Formal Elements of Interface Design, Active Elements of Interface Design, Composing the Elements of Interface Design, UI Design Process, Visual Communication design component in Interface Design.

**Unit-2: Introduction to UX**

UX Basics - Foundation of UX design, Good and poor design, Understanding Your Users, Designing the Experience - Elements of user Experience, Visual Design Principles, Functional Layout, Interaction design, Introduction to the Interface, Navigation Design, User Testing, Developing and Releasing Your Design.

**Unit-3: UI Design Process:**

Visual Design Principles, Information Design and Data Visualization, Interaction Design, Information Architecture, Wire framing & Storyboarding, Elements and Widgets, Screen Design and Layouts.  
 User Research: What is Research in User Experience Design?, Tools and Method used for Research, User Needs and its Goals, Know about Business Goals, How to deliver a research and its phases.

**Unit-4: UI/ UX Design Tools**

User Study- Interviews, writing personas: user and device personas, User Context, Building Low Fidelity Wireframe and High-Fidelity Polished Wireframe Using wireframing Tools, Creating the working Prototype using Prototyping tools, Sharing and Exporting Design.

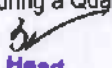
**Course Outcome:** After completion of this course, students will be able to:

- i) Understand iterative user-centered design of graphical user interfaces.
- ii) Apply the user Interfaces to different devices and requirements.
- iii) Create high quality professional documents and artifacts related to the design process.

**Instructions for paper setter:** All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. 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. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

**Text Books / Reference Books:**

1. A Project Guide to UX Design: For user experience designers in the field or in the making, 2<sup>nd</sup> Edition, by Russ Unger and Carolyn Chandler, New Riders Publishing, USA, 2012.
2. The Elements of User Experience: User-Centered Design for the Web and Beyond, 2<sup>nd</sup> Edition by Jesse James Garrett, Pearson Education, 2011.
3. The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques, 3<sup>rd</sup> Edition Wilbert O. Galitz, Wiley Publishing, 2007.
4. The UX Book Process and Guidelines for Ensuring a Quality User Experience, Rex Hartson and Pardha S. Pyla, Elsevier, 2012.

  
 Head  
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 Maharishi Markandeshwar  
 Mullana, Ambala  
 Haryana, India



w.e. f. July 2022

B. Tech. in CSE with Specialization in Cloud Technology & Information Security: 7<sup>th</sup> Semester Scheme

Sr. No.	Category	Course	Course Title	Teaching Schedule			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Professional Core Course	BCSE-671	Information Security	2	-	-	2	40	60	-	100
2	Professional Elective Course		Elective-IV	3	-	-	3	40	60	-	100
3	Professional Elective Course		Elective-V	3	-	-	3	40	60	-	100
4	Open Elective Course		Open Elective-II	3	-	-	3	40	60	-	100
5	Open Elective Course		Open Elective-III	3	1	-	4	40	60	-	100
6	Open Elective Course		Open Elective-IV	3	1	-	4	40	60	-	100
7	Project	BCSE-526	Project-IV	-	-	8	4	60	-	40	100
<b>TOTAL</b>				<b>17</b>	<b>2</b>	<b>8</b>	<b>23</b>	<b>300</b>	<b>360</b>	<b>40</b>	<b>700</b>

Elective-IV	Open Elective-II	Open Elective-IV
BCSE-672: Advanced Cloud Architecture	BCIV-084: Rural Technology & Community Development	BECE-517: Digital Signal Processing
BCSE-673: Cloud Security and Data Protection	BECE-531: Embedded Systems	BCIV-085: Infrastructure System-Planning
BCSE-674: Openstack	BECE-550: Internet of Things	BECE-543: Fiber Optic Communication
Elective-V	BT-401: Bioinformatics	BELE-529: Measurements & Instrumentation
BCSE-675: Security and Privacy of Online Social Media Networks	Open Elective-III	
BCSE-676: Server Security	BECE-537: Mobile Communication & Networks	
BCSE-677: Mobile Wireless and VoIP Security	BCIV-082: General Principles of Building Construction	
	BELE-537: Wind & Solar Energy System	
	BECE-524: Control Systems	

Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.

*Dr*  
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 Mullana, Ambala, Haryana-133207,

w.e. f. July 2022

**Bachelor of Technology in CSE with specialization in Data Science: 7<sup>th</sup> Semester Scheme**

Sr. No.	Category	Course	Course Title	Teaching Schedule			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Professional Core Course	BCSE-617	Advanced Machine Learning	2	-	-	2	40	60	-	100
2	Professional Elective Course		Elective-IV	3	-	-	3	40	60	-	100
3	Professional Elective Course		Elective-V	3	-	-	3	40	60	-	100
4	Open Elective Course		Open Elective-II	3	-	-	3	40	60	-	100
5	Open Elective Course		Open Elective-III	3	1	-	4	40	60	-	100
6	Open Elective Course		Open Elective-IV	3	1	-	4	40	60	-	100
7	Project	BCSE-526	Project-IV	-	-	8	4	60	-	40	100
<b>TOTAL</b>				<b>17</b>	<b>2</b>	<b>8</b>	<b>23</b>	<b>300</b>	<b>360</b>	<b>40</b>	<b>700</b>

Elective-IV	Open Elective-II	Open Elective-IV
BCSE-551 : Block Chain Technology	BCIV-084: Rural Technology & Community Development	BECE-517: Digital Signal Processing
BCSE-619: Big Data Analytics on Cloud	BECE-531: Embedded Systems	BCIV-085: Infrastructure System-Planning
BCSE-620: Real Time Data Processing	BECE-550: Internet of Things	BECE-543: Fiber Optic Communication
BCSE-621: Data Analytics using SQL	BT-401: Bioinformatics	BELE-529: Measurements & Instrumentation
Elective-V	Open Elective-III	
BCSE-622: Social Media Analytics using R	BECE-537: Mobile Communication & Networks	
BCSE-623: Predictive Analysis using Python	BCIV-082: General Principles of Building Construction	
BCSE-624: Data Visualization Techniques	BELE-537: Wind & Solar Energy System	
BCSE-625 : Advanced Big Data Analytics	BECE-524: Control Systems	

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**

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**Bachelor of Technology in Computer Science & Engineering with Specialization in Data Science**  
**5<sup>th</sup> Semester Scheme**

Sr. No.	Category	Course Code	Course Title	Teaching Schedule (Hours per week)			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Humanities and Social Sciences including Management Course	BHUM-004	Economics for Engineers	3	0	0	3	40	60	-	100
2	Professional Core Course	BCSE-601	R Programming	2	0	0	2	40	60	-	100
3	Professional Core Course	BCSE-601L	R Programming Lab	0	0	4	2	60	-	40	100
4	Professional Core Course	BCSE-514	Big Data & Analytics	2	0	0	2	40	60	-	100
6	Professional Core Course	BCSE-514L	Big Data & Analytics Lab	0	0	4	2	60	-	40	100
5	Professional Elective Course		Elective-I	3	0	0	3	40	60	-	100
7	Professional Elective Course		Elective-I Lab	0	0	4	2	60	-	40	100
8	Professional Elective Course		Elective-II	2	0	0	2	40	60	-	100
9	Professional Elective Course		Elective-II Lab	0	0	2	1	60	-	40	100
10	Project	IOT-3	Industrial Connectivity for IOT	0	0	4	2	60	-	40	100
11	Mandatory Course	BHUM-117	Essence of Indian Traditional Knowledge	2	0	0	0	40	60	-	100
<b>TOTAL</b>				<b>14</b>	<b>0</b>	<b>18</b>	<b>21</b>	<b>540</b>	<b>360</b>	<b>200</b>	<b>1100</b>

Elective-I	Elective-I Lab
BCSE-531: PHP and its Framework	BCSE-531L: PHP and its Framework Lab
BCSE-532: Java and its Framework	BCSE-532L: Java and its Framework Lab
BCSE-533: Python and its Framework	BCSE-533L: Python and its Framework Lab
BCSE-534: Javascript and its Framework	BCSE-534L: Javascript and its Framework Lab

Elective-II	Elective-II Lab
BCSE-611: Sampling Methods	BCSE-611L: Sampling Methods Lab
BCSE-612: Optimization Techniques	BCSE-612L: Optimization Techniques Lab
BCSE-613: Linear Algebra	BCSE-613L: Linear Algebra Lab

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**


  
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**Bachelor of Technology in Computer Science & Engineering**  
**5<sup>th</sup> Semester Scheme**

Sr. No.	Category	Course Code	Course Title	Teaching Schedule (Hours per week)			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Humanities and Social Sciences including Management Course	BHUM-004	Economics for Engineers	3	0	0	3	40	60	-	100
2	Professional Core Course	BCSE-513	Cloud Computing	2	0	0	2	40	60	-	100
3	Professional Core Course	BCSE-513L	Cloud Computing Lab	0	0	4	2	60	-	40	100
4	Professional Core Course	BCSE-514	Big Data & Analytics	2	0	0	2	40	60	-	100
6	Professional Core Course	BCSE-514L	Big Data & Analytics Lab	0	0	4	2	60	-	40	100
5	Professional Elective Course		Elective-I	3	0	0	3	40	60	-	100
7	Professional Elective Course		Elective-I Lab	0	0	4	2	60	-	40	100
8	Professional Elective Course		Elective-II	3	0	0	3	40	60	-	100
9	Project	IHOT-3	Industrial Connectivity for IIOT	0	0	4	2	60	-	40	100
10	Mandatory Course	BHUM-117	Essence of Indian Traditional Knowledge	2	0	0	0	40	60	-	100
<b>TOTAL</b>				<b>15</b>	<b>0</b>	<b>16</b>	<b>21</b>	<b>480</b>	<b>360</b>	<b>160</b>	<b>1000</b>

Elective-I	Elective-I Lab
BCSE-531: PHP and its Framework	BCSE-531L: PHP and its Framework Lab
BCSE-532: Java and its Framework	BCSE-532L: Java and its Framework Lab
BCSE-533: Python and its Framework	BCSE-533L: Python and its Framework Lab
BCSE-534: Javascript and its Framework	BCSE-534L: Javascript and its Framework Lab
Elective-II	
BCSE-541: Data Warehousing and Data Mining	
BCSE-542: UI / UX Design	
BCSE-543: Software Project Management	
BCSE-544: Object Oriented Modelling	

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**

  
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
**Bachelor of Technology in Computer Science & Engineering with Specialization in Cloud Technology & Information Security: 5<sup>th</sup> Semester Scheme**

Sr. No.	Category	Course Code	Course Title	Teaching Schedule (Hours per week)			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Humanities and Social Sciences including Management Course	BHUM-004	Economics for Engineers	3	0	0	3	40	60	-	100
2	Professional Core Course	BCSE-652	Linux Administration	2	0	0	2	40	60	-	100
3	Professional Core Course	BCSE-652L	Linux Administration Lab	0	0	4	2	60	-	40	100
4	Professional Core Course	BCSE-653	Virtualization & Scheduling	2	0	0	2	40	60	-	100
6	Professional Core Course	BCSE-653L	Virtualization & Scheduling Lab	0	0	4	2	60	-	40	100
5	Professional Elective Course		Elective-I	3	0	0	3	40	60	-	100
7	Professional Elective Course		Elective-I Lab	0	0	4	2	60	-	40	100
8	Professional Elective Course		Elective-II	2	0	0	2	40	60	-	100
9	Professional Elective Course		Elective-II Lab	0	0	2	1	60	-	40	100
10	Project	IHOT-3	Industrial Connectivity for IIOT	0	0	4	2	60	-	40	100
11	Mandatory Course	BHUM-117	Essence of Indian Traditional Knowledge	2	0	0	0	40	60	-	100
<b>TOTAL</b>				<b>14</b>	<b>0</b>	<b>18</b>	<b>21</b>	<b>540</b>	<b>360</b>	<b>200</b>	<b>1100</b>

Elective-I	Elective-I Lab
BCSE-531: PHP and its Framework	BCSE-531L: PHP and its Framework Lab
BCSE-532: Java and its Framework	BCSE-532L: Java and its Framework Lab
BCSE-533: Python and its Framework	BCSE-533L: Python and its Framework Lab
BCSE-534: Javascript and its Framework	BCSE-534L: Javascript and its Framework Lab

Elective-II	Elective-II Lab
BCSE-666: Cloud Infrastructure Deployment	BCSE-666L: Cloud Infrastructure Deployment Lab
BCSE-667: Cloud & Big Data	BCSE-667L: Cloud & Big Data Lab
BCSE-668: Managing Cloud	BCSE-668L: Managing Cloud Lab

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**


  
**Head**  
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 Mullanah, Ambala, Haryana-133207

M.M. (DEEMED TO BE UNIVERSITY) MULLANA  
B.Tech. (Common for All Branches)  
HSMC-051 - Universal Human Values

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Theory: 60  
Continuous Evaluation: 40  
Time: 3 Hours  
Credit: 3.0

**Course Objective:**

- I. Development of a holistic perspective based on self-exploration about themselves family, Society and nature / existence.
- II. Understanding of the harmony in the human being , family ,society, and nature / existence.
- III. Strengthening of self-reflection.
- IV. Development of commitment and courage to act.

**Unit-I: Course Introduction- Need, basic guidelines, content and process for value education**

(9 Hours)

1. Purpose and motivation for the course, recapitulation from Universal Human Value-1
2. Self - Exploration- What is it ? Its content and process; Natural 'Acceptance' and Experiential validation - as the process for the self-exploration.
3. Contentious Happiness and prosperity - A look at basic Human Aspirations.
4. Right understanding relationship and physical facility- the basic requirement for fulfillment of aspirations of every human being with their correct priority.
5. Understanding Happiness and prosperity correctly - A Critical Appraisal of the current scenario
6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility rather than as arbitrariness in choice based on liking-disliking.

**Unit-II: Understanding Harmony in the Human Being - Harmony in Myself.**

(9 Hours)

1. Understanding human being as a co-existence of the sentient 'I' and the material Body.
2. Understanding the needs of self and body- happiness and physical facility.
3. Understanding the body as an instrument of 'I'
4. Understanding the characteristics and activities of 'I' and Harmony in 'I'
5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role other have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

**Unit-III: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship**

(9 Hours)

1. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
2. Understanding the meaning of Trust; Difference between intention and competence
3. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
4. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals.
5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

**Unit-IV: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence**

(9 Hours)

1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature.
3. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space.
4. Holistic perception of harmony at all levels of existence.
5. Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.
6. Natural acceptance of human values Universal Order
7. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
8. Case studies of typical holistic technologies, management models and production systems

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions e.g. to discuss the conduct as an engineer or scientist etc.

**Text Book**

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

**Reference Books**

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Amarkantak, 1999, Jeevan Vida Prakashan,
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi.
5. Small is Beautiful -E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj - Pandit Sunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)

Head

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**w.e.f. July 2022**  
**Scheme for B. Tech. (Common to all Branches)**  
**1<sup>st</sup> Semester**

Sr. No.	Category	Course Code	Course Title	Hours per week			Total Hours	Credits	Examination Marks			
				L	T	P			Internal	Theory	Practical	Total
1	Basic Science Courses (Foundation)	BPHY-001	Physics-I	3	1	0	4	4	40	60	-	100
2	Basic Science Courses	BMAT-001 / BMAT-001/A	Mathematics-I (Common for all branches <b>except Biotechnology</b> ) / Mathematics-I (Biotechnology Only)	3	1	0	4	4	40	60	-	100
3	Engineering Science Courses	BELE-001	Basic Electrical Engineering	3	1	0	4	4	40	60	-	100
4	Engineering Science Courses	BMEC-001	Engineering Graphics & Design	0	0	4	4	2	60	-	40	100
5	Engineering Science Courses	BMEC-002	Engineering Mechanics	3	1	0	4	4	40	60	-	100
6	Basic Science Courses	BPHY-002	Physics Lab-I	0	0	2	2	1	60	-	40	100
7	Engineering Science Courses	BCSE-001	Computational & Problem Solving	0	0	3	3	1.5	60	-	40	100
8	Engineering Science Courses	BELE-002	Basic Electrical Engineering Lab	0	0	2	2	1	60	-	40	100
9	Engineering Science Courses	BCSE-005	IT Skills for Business	0	0	2	2	1	60	-	40	100
10	Engineering Science Courses	BCSE-003	Digital Marketing	0	0	2	2	1	60	-	40	100
11	Training	MFGI / IIOT-I	Product Design & Development / IIOT Foundations	0	0	4	4	2	60	-	40	100
<b>TOTAL</b>				<b>12</b>	<b>4</b>	<b>19</b>	<b>35</b>	<b>25.5</b>	<b>580</b>	<b>240</b>	<b>280</b>	<b>1100</b>

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**

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w.e. f. July 2022

**Bachelor of Technology in Computer Science & Engineering with Specialization in Full Stack Development  
3<sup>rd</sup> Semester Scheme**

Sr. No.	Category	Course Code	Course Title	Teaching Schedule (Hours per week)			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Basic Science Course	BMAT-003C	Statistical Techniques	3	0	0	3	40	60	-	100
2	Basic Science Course	BMAT-003CL	Statistical Techniques Lab	0	0	2	1	60	-	40	100
3	Professional Core Course	BCSE-502	Data Structure & Algorithms	3	0	0	3	40	60	-	100
4	Professional Core Course	BCSE-502L	Data Structure & Algorithms Lab	0	0	2	1	60	-	40	100
6	Professional Core Course	BCSE-503	Computer Organization & Architecture	3	1	0	4	40	60	-	100
5	Professional Core Course	BCSE-504	Software Engineering & Testing Tools	3	0	0	3	40	60	-	100
7	Professional Core Course	BCSE-504L	Software Engineering & Testing Tools Lab	0	0	2	1	60	-	40	100
8	Professional Core Course	BCSE-505	Business Intelligence & its Tools	2	0	0	2	40	60	-	100
9	Professional Core Course	BCSE-506	Performance Analysis of Programming Languages	3	0	0	3	40	60	-	100
10	Professional Core Course	BCSE-506L	Performance Analysis of Programming Languages Lab	0	0	2	1	60	-	40	100
11	Project	IHOT-3	Industrial Connectivity for IIOT	0	0	4	2	60	-	40	100
12	Humanities and Social Sciences including Management Course	HSMC-051	Universal Human Values	3	0	0	3	40	60	-	100
<b>TOTAL</b>				<b>20</b>	<b>1</b>	<b>12</b>	<b>27</b>	<b>580</b>	<b>420</b>	<b>200</b>	<b>1200</b>

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**


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**Category wise Credits Distribution Details for Batch 2022-2026 Onwards**  
**(CSE with Specialization in Full Stack Development)**

Sr. No.	Category	Category Code	1st	2nd	3rd	4th	5th	6th	7th	8th (Inter nship)	8th (Non-Internship)
1	Humanities and Social Sciences including Management courses	HSMC	0	3	3	0	3	3	0	0	0
2	Basic Science courses	BSC	9	13	4	0	0	0	0	0	0
3	Engineering Science courses including workshop, drawing, basics of electrical / mechanical / computer etc	ESC	14.5	5.5	0	0	0	0	0	0	0
4	Professional core courses	PCC	0	0	18	21	7	8	3	0	6
5	Professional Elective courses relevant to chosen specialization/branch	PEC	0	0	0	0	7	3	7	0	0
6	Open subjects – Electives from other technical and /or emerging subjects	OEC	0	0	0	0	0	3	6	0	0
7	Project work, seminar and internship in industry or elsewhere	PROJ	2	2	2	2	2	2	0	8	2
8	Mandatory Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Knowledge Tradition]	MC	0	2 (EVS)	0	0	(Non-credit) EO/TK	(Non-credit) IC	0	0	0
<b>Total</b>			<b>25.5</b>	<b>25.5</b>	<b>27</b>	<b>23</b>	<b>19</b>	<b>19</b>	<b>16</b>	<b>8</b>	<b>8</b>

NOTE: Total 163 Credits are required to get B. Tech. Degree.


  
**Head**  
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**Mullana, Haryana-133207**

w.e. f. July 2022

**Bachelor of Technology in Computer Science & Engineering with Specialization in Big Data and Analytics**  
**3<sup>rd</sup> Semester Scheme**

Sr. No.	Category	Course Code	Course Title	Teaching Schedule (Hours per week)			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1	Basic Science Course	BMAT-003C	Statistical Techniques	3	0	0	3	40	60	-	100
2	Basic Science Course	BMAT-003CL	Statistical Techniques Lab	0	0	2	1	60	-	40	100
3	Professional Core Course	BCSE-502	Data Structure & Algorithms	3	0	0	3	40	60	-	100
4	Professional Core Course	BCSE-502L	Data Structure & Algorithms Lab	0	0	2	1	60	-	40	100
6	Professional Core Course	BCSE-503	Computer Organization & Architecture	3	1	0	4	40	60	-	100
5	Professional Core Course	BCSE-504	Software Engineering & Testing Tools	3	0	0	3	40	60	-	100
7	Professional Core Course	BCSE-504L	Software Engineering & Testing Tools Lab	0	0	2	1	60	-	40	100
8	Professional Core Course	BCSE-505	Business Intelligence & its Tools	2	0	0	2	40	60	-	100
9	Professional Core Course	BCSE-506	Performance Analysis of Programming Languages	3	0	0	3	40	60	-	100
10	Professional Core Course	BCSE-506L	Performance Analysis of Programming Languages Lab	0	0	2	1	60	-	40	100
11	Project	IHOT-3	Industrial Connectivity for IIOT	0	0	4	2	60	-	40	100
12	Humanities and Social Sciences including Management Course	HSMC-051	Universal Human Values	3	0	0	3	40	60	-	100
<b>TOTAL</b>				<b>20</b>	<b>1</b>	<b>12</b>	<b>27</b>	<b>580</b>	<b>420</b>	<b>200</b>	<b>1200</b>

**Note: Student can earn 3 credits through MOOC / Swayam courses in a semester which can be used in place of any subject having same credit value in that semester only.**


  
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**Category wise Credits Distribution Details for Batch 2022-2026 Onwards  
(CSE with Specialization in Big Data and Analytics)**

Sr. No.	Category	Category Code	1st	2nd	3rd	4th	5th	6th	7th	8th (Inter nship)	8th (Non-Internship)
1	Humanities and Social Sciences including Management courses	HSMC	0	3	3	0	3	3	0	0	0
2	Basic Science courses	BSC	9	13	4	0	0	0	0	0	0
3	Engineering Science courses including workshop, drawing, basics of electrical / mechanical / computer etc	ESC	14.5	5.5	0	0	0	0	0	0	0
4	Professional core courses	PCC	0	0	18	21	7	8	3	0	6
5	Professional Elective courses relevant to chosen specialization/branch	PEC	0	0	0	0	7	3	7	0	0
6	Open subjects – Electives from other technical and /or emerging subjects	OEC	0	0	0	0	0	3	6	0	0
7	Project work, seminar and internship in industry or elsewhere	PROJ	2	2	2	2	2	2	0	8	2
8	Mandatory Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Knowledge Tradition]	MC	0	2 (EVS)	0	0	(Non-credit) EOITK	(Non-credit) IC	0	0	0
<b>Total</b>			<b>25.5</b>	<b>25.5</b>	<b>27</b>	<b>23</b>	<b>19</b>	<b>19</b>	<b>16</b>	<b>8</b>	<b>8</b>

**NOTE: Total 163 Credits are required to get B. Tech. Degree.**

  
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