MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Computer Science and Engineering

Board of Studies(BoS) Proceeding
in
Computer Science and Engineering
(Meeting Dated-07 June 2021)

D No. 76
18.10.2021

Madhav Institute of Technology & Science, Gwalior-474 005

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

CSE/Ref No. 6403 dt. 14/9/21

Department of Computer Science and Engineering

Minutes of Meeting of Board of Studies (BoS) in Computer Science and Engineering

Date: 07/06/2021

The Meeting of Board of Studies (BoS) in Computer Science & Engineering was held on 7th June, 2021 (01:30 P.M. onwards) **through video conferencing**. During the meeting following were present.

1.	Dr. Manish Dixit, Professor & Head Department of Computer Science and Engineering Madhav Institute of Technology and Science, Gwalior	Chairman
2.	Dr. A. K. Solanki, Professor (Computer Science & Engineering), B I.E.T. Jhansi (U.P.)	External Member (Academics) *(Nominee of Hon'ble Vice Chancellor RGPV Bhopal)*
3.	Dr. Nanhay Singh, Professor & Head, Department of Computer Science and Engineering, Ambedkar Institute of Advanced Communication Technologies & Research (AIACTR), Delhi	External Member (Academics) *(Nominee of Academic Council (AC), MITS Gwalior)*
4.	Dr Virendra Prasad Vishwakarma, Professor, University School of Information and Communication Technology (USICT), Guru Gobind Singh Indraprastha University (GGSIPU), Delhi	External Member (Academics) *(Nominee of Academic Council (AC), MITS Gwalior)*
5.	Dr Sandeep Sharma, Managing Director, Deloitte, Hyderabad	External Member (Industry)
6.	Dr.Diresh Kumar Vishwakarma, Associate Professor, Dept of IT, DTU, Delhi	External Member (Academics) (Nominated by DTU Delhi under Twinning arrangement of TEQIP-III)
7.	Mr. Ashish Khare, Senior Software Engineer, Qualys Inc(US based security solutions provider)	External Member (Alumnus)
8.	Dr. Nisha Chaurasia, Assistant Professor, Department of IT, D. B. R. Ambedkar National Institute of Technology (NIT) Jalandhar	External Member (Alumnus)
9.	Dr. R. K. Gupta, Professor	Member
10.	Ms. Khushboo Agarwal, Assistant Professor	Member
11.	Ms. Jaimala Jha, Assistant Professor	Member
12.	Mr. Jamvant Singh Kumare, Assistant Professor	Member
13.	Mr. Mahesh Parmar, Assistant Professor	Member
14.	Dr. R. R. Singh Makwana, Assistant Professor	Member
15.	Mr. Amit Kumar Manjhvar, Assistant Professor	Member
16.	Ms Anjula Mehto, Assistant Professor	Member

17.	Dr. R. S. Jadon, Professor (Computer Application)	Member
18.	Dr. Anshu Chaturvedi, Professor (Computer Application)	Member
19.	Dr. Parul Saxena, Asst Professor (Computer Application)	Member

In addition to above, faculty members engaged under TEQIP-III Project were also present.

The following external members could not attend the meeting.

1.	Mr. Amitabh Shrivastava, Senior Consultant, TCS Noida	External Member (Industry)
2	Dr. Virendra Prasad Vishwakarma, Professor, University School of Information and Communication Technology (USICT), Guru Gobind Singh Indraprastha University	External Member (Academics) *(Nominee of Academic Council (AC), MITS Gwalior)*
3	Dr. Kapil Sharma, Professor and Head , Dept of IT, DTU, Delhi	External Member (Academics) (Nominated by DTU Delhi under Twinning arrangement of TEQIP-III)

Minutes of the BoS

(Approved by the Academic Development Cell for all BoS Meetings Scheduled on June 7th 2021)

1. *Minutes of last BOS held on 28 Nov2020 are confirmed by the House.*
2. *Following are the points which are discussed as per agenda in the BOS on 7th June 2021.*

Item 1:	To propose the list and syllabi for all *Departmental Elective (DE)* Courses of *VII Semester* under the flexible curriculum along with their COs (Batch admitted in 2018-19) **The courses to be offered under Departmental Elective (DE-3) category (in offline mode) for B.Tech VII Semester, CSE discipline (under flexible curriculum) has already been finalized during the BOS meeting, dated 30th May 2020 (under the ITEM CSEIT-2, Syllabus in Annexure-I). Subsequently, the same was also approved by the Academic Council, Same subjects with syllabus (along with their COs) has been adopted for Batch admitted in 2018-19 without any changes. Subjects are: -** <table><tr><td>**Departmental Elective (DE-3)**</td><td>**Course Code**</td></tr><tr><td>Networking with TCP/IP</td><td>150711</td></tr><tr><td>Data Mining & Warehousing</td><td>150712</td></tr><tr><td>Distributed System</td><td>150713</td></tr></table> *Syllabus* (along with their COs) are attached in <u>Annexure-1</u>, <u>BOS Approved Minutes Dated 30 May 2020 May be referred.</u>
Item 2:	To propose the list of courses which the students can opt from SWAYAM/NPTEL/MOOC Platform, to be offered in *online mode under Departmental Elective (DE) category,* for credit transfer in the *VII Semester (Batch admitted in 2018-19)* **The list of Departmental Elective (DE-4) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VII Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.** <table><tr><td colspan="2">**Departmental Elective (D E- 4)**</td><td>**Course Code**</td></tr><tr><td>**Course ID: noc21_cs62**</td><td>Cloud Computing</td><td>150754</td></tr><tr><td>**Course ID: noc21_cs76**</td><td>Deep learning – IIT Ropar</td><td>150755</td></tr><tr><td>**Course ID: noc21_cs73**</td><td>Software Testing</td><td>150756</td></tr></table> *In continuation, it is also discussed and recommended that the above-mentioned list of Departmental Elective (DE) course may be kept dynamic and newly emerging courses may be inducted in line with the industrial need and emerging developments (as and when required).* **Scheme is attached in the <u>Annexure-2</u>**
Item 3:	To propose the list and syllabi for all *Open Category (OC)* Courses of *VII Semester* under the flexible curriculum along with their COs *(Batch admitted in 2018-19)* **The courses to be offered under Open Category (OC) Courses for B.Tech VII Semester (for the students of other departments) under flexible curriculum, has**

already been finalized during the BoS meeting, dated 30th May 2020 (under the ITEM CSEIT-4, Syllabus in Annexure-II). Subsequently, same was also approved by the Academic Council, two courses from the same approved list with syllabus (along with their COs) have been adopted for Batch admitted in 2018-19 without any change. Subjects are: -

OC-2	Code
Soft Computing	900208
Network Security	900209
OC-3	
R Programming	900220
Computer Networks	900222

It is further discussed that the Open Category (OC) courses are meant only for the students of other departments; therefore, the above list of courses may be kept dynamic (as per the need and demand from other departments).

Syllabus (along with their COs) are attached in <u>Annexure-3</u>

Scheme is attached in <u>Annexure-2</u>

Item 4:

To propose the list of "Additional Courses" which can be opted for getting an

1) *Honours (for students of the host department)*
2) *Minor Specialization (for students of other departments)*

[These will be offered through SWAYAM NPTEL MOOC based Platforms for the V semester (for the batch admitted in 2019-20) and for VII semester students (for the batch admitted in 2018-19)]

The courses available on SWAYAM/NPTEL/MOOC based learning platforms for Honours and Minor Specialization were discussed and identified. The same is listed, as mentioned below

1) **Courses for "Minor Specialization"** - *V Semester*

Course ID: noc21_cs55	Programming in C++	Domain Specialization- programming (NPTEL rules must be satisfied)
Course ID: noc21-cs67	Programming, Data Structures and Algorithms in Python	Domain Specialization- programming
Course ID: noc21-cs72	Introduction to Operating Systems	Domain Specialization- Systems
Course ID: noc21-cs62	Cloud Computing	Domain Specialization- Systems

2) **Courses for "Honours"** *V Semester*

Course ID: noc21-cs75	The Joy of Computing using Python
Course ID: noc21-cs95	Advanced computer architecture
Course ID: noc21-cs62	Cloud computing

3) **Courses for "Minor Specialization"** - *VII semester*

Course ID: noc21-cs97	Computer Graphics
Course ID: noc21-cs83	Theory of Computation
Course ID: noc21-cs73	Software Testing

4) Courses *for "Honours"- VII Semester*

Course ID: noc21-cs93	Deep Learning for Computer Vision
Course ID: noc21-cs92	Parameterized Algorithms
Course ID: noc21-cs86	Big Data Computing

In the emergent situation, the above list may be expanded.

Item 5:	To review and update the syllabi for all *Departmental Core (DC) Courses* of *VII & V Semester (for b*atches admitted in 2018-19 & 2019-20 respectively) under the flexible curriculum along with their COs **Departmental Core (DC) Courses of V Semester has already been finalized during the BoS meeting, dated 9th April 2019 (under the ITEM- 1, Syllabus in Annexure-I). Subsequently, the same was also approved by the Academic Council, Same subject with syllabus (along with their COs) has been adopted for Batch admitted in 2019-20 without any change. Subjects are: -** <table><tr><td>**Departmental Core (DC) Courses**</td></tr><tr><td>Software Engineering 150502 (DC-9)</td></tr><tr><td>Theory of Computation 150503 (DC-10)</td></tr><tr><td>Microprocessor & Interfacing 150504 (DC-11)</td></tr></table> Scheme- Vth Sem 2019 admitted batch is attached in Annexure-4(a), Syllabus (along with their COs) attached in the Annexure-4(b).
Item 6:	To propose the list of courses which the students can opt from SWAYAM/NPTEL/MOOC Platform for *Seminar/Self Study Courses* in V Semester (Batch admitted in 2019-20) **The courses to be offered under *Seminar/Self Study through* SWAYAM / NPTEL based learning platform for B.Tech V semester (2019 admitted batch) (CSE), under flexible curriculum were discussed and finalized as per the following:** <table><tr><td>Course ID: noc21-cs78</td><td>Python for Data Science</td></tr><tr><td>Course ID: noc21-cs103</td><td>Introduction to Quantum Computing: Quantum Algorithms and Qiskit</td></tr><tr><td>Course ID: noc21-mg57</td><td>Gender justice and workplace security</td></tr><tr><td>Course ID: noc21-mg74</td><td>Decision-Making Under Uncertainty</td></tr></table> **This will be compulsory to register for one online course using SWAYAM/NPTEL. Further, the evaluation will be based on attendance, assignments and presentations. In the emergent situation, the above list may be expanded. Same is also mentioned here in** **Annexure -4(a) Scheme of V Sem – 2019 Admitted Batch**
Item 7:	Scheme & Syllabi (along with the Course Outcomes) of III & IV semester of the B.Tech students of 2020-21 admitted batch according to the revised structure. **The newly proposed scheme and curriculum for B.Tech (CSE) III and IV Semester were presented before the house.** **Scheme & Syllabus (along with their COs) attached in the Scheme Annexure-5(a) and Syllabus Annexure - 5(b)** **The courses to be offered under *Seminar/Self Study through* SWAYAM / NPTEL**

	based learning platform for B.Tech III semester (2020 admitted batch) (CSE), under flexible curriculum were discussed and finalized as per the following: | Course ID: noc21-cs81	C Programming and Assembly Language
Course ID: noc21-hs70	Patent Drafting for Beginners
Course ID: noc21-ge18	Stress Management
Course ID: noc21-mg74	Decision-Making Under Uncertainty | This will be compulsory to register for one online course using SWAYAM/NPTEL. Further, the evaluation will be based on attendance, assignments and presentations. In the emergent situation, the above list may be expanded.
Item 8:	To review and finalize the Experiment list/ Lab manual for Laboratory Courses to be offered in V and VII semester (Batches admitted in 2018-19 & 2019-2020) The experiment list and lab manual for the Laboratory Course has been revised and attached in Annexure-6. Moreover, the proposed list may be expanded.
Item 9:	To propose a suggestive list of projects which can be assigned under the 'Skill based mini-project' category in various laboratory courses to be offered in July-December 2021. The list of projects which can be assigned under the 'Skill based mini-project' has been finalized and attached in Annexure-7. Moreover, the proposed list may be expanded.
Item 10:	To review the CO attainments for July-December 2020 semester, to identify gaps and to suggest corrective measures for the improvement in the CO attainment levels Attached in Annexure-8
Item 11:	To review curriculum feedback from various stakeholders, its analysis and impact The detailed analysis report of feedback on curriculum and Course Outcomes (COs) from various stakeholders (students, alumni, faculty members, etc.) was presented and discussed. The house noticed and appreciated that most of the suggested courses (on emerging areas) / activities (from alumni) are in practice (at present) in the department. Moreover, it is discussed that the department will take necessary initiatives, wherever required. Attached in Annexure-9
Item 12:	To review course outcomes (COs) feedback of various courses, its analysis and impact Attached in Annexure-10
Item 13:	To present matters, if any, related to new curriculum/structure PG programme (Batch admitted in 2020-21) needing ratification in the forthcoming Academic Council meeting. 1. M.Tech II semester OC and DE Courses for admitted batch 2020-21. (New list after rectification) | DE-2* (Through SWAYAM/NPTEL)

620216- Cloud Computing
620217- Social Networking
OC-2
800204 - Internet of Things
800205 - Deep Learning	

Syllabus of OC-2 Course are being attached in the <u>Annexure-11</u>

<u>M Tech Scheme(Second Sem) with Revised DE and OC courses – Annexure 11(a)</u>

2. The list of courses which the students can opt from SWAYAM/NPTEL/MOOC Platform for *Self Learning/Presentation(620222)* in II Semester (Batch admitted in 2020-21) M Tech

noc21-cs78	Python for Data Science

3. The list and syllabi for all *Open Category (OC)* Courses **(MOOC Course)** of *III Semester* under the flexible curriculum along with their COs *(Batch admitted in 2020-21)*

noc21-cs86	Big Data Computing
noc21-cs101	Computer Vision

Already approved Scheme of M Tech 3rd Semester- 30 May 2020

4. **MCA Agenda, Schemes and Syllabus to be presented in BOS is also enclosed**

Item 14:

Any other department specific matter(s).

1) **DE-2 VI Semester (Jan-June 2021) for admitted batch 2018-19(New list after rectification)**

Course ID: noc21_cs45	Data Analytics with Python- 150651
Course ID: noc21_cs24	Introduction to Machine Learning- 150652
Course ID: noc21_cs42	An Introduction to Artificial Intelligence-150654
Course ID: noc21_cs26	Artificial Intelligence: Knowledge Representation and Reasoning- 150655
Course ID: noc21_cs51	Machine Learning, ML - 150656

2) **DE-1 (Through traditional Mode) VI Semester for admitted batch 2018-19 (New list after rectification).**

Network & Web Security-150611
Image Processing-150612
Mobile Computing-150613

3) **Honours Specialization VI Semester for admitted batch 2018-19 (New list after rectification)**

Course ID: noc21_cs46	GPU Architecture and Programming
Course ID: noc21_cs28	Privacy and Security in online social media
Course ID: noc21_cs49	Computational Complexity Theory

4) **Minor Specialization VIII Semester for admitted batch 2017-18 (New list after rectification)**

Course ID: noc21_cs43	Foundations of Cryptography
Course ID: noc21_cs24	Introduction to Machine Learning
Course ID: noc21_cs46	GPU Architecture and Programming

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5) **Honours Specialization VIII Semester (Jan-June 2021) for admitted batch 2017-18 (New list after rectification)**

Course ID: noc21_cs50	User-centric computing for Human-Computer Interaction
Course ID: noc21_cs71	Reinforcement Learning
Course ID: noc21_cs30	Information Security-5-Secure Systems Engineering
Course ID: noc21_cs43	Foundations of Cryptography

6) Rectification of Already approved Scheme for 2020-21 Admitted Batch in UG CSE (Slight Modification as per suggestions of Academic Development Cell)

Scheme & Syllabi (along with the Course Outcomes) of I & II semester of the B.Tech students of 2020-21 admitted batch(Modified scheme) according to the revised structure and the same scheme is adopted for admitted batch 2021-22.

The newly proposed scheme and curriculum for B.Tech (CSE) I and II Semester were presented before the house.
Scheme & Syllabus (along with their COs) which was approved in Nov2020 BOS meeting is attached in the <u>Scheme Annexure-12</u> and <u>Syllabus Annexure - 13</u>

<u>Scheme of Ist and IInd Sem is enclosed after Modification in Annexure-14</u>

Guidelines for IT Workshop Lab Course (May be expanded as per need)
<u>Annexure 15</u>

List of Program and Skill Based Project for Lab Course of 2nd Sem UG- CSE (150211,150212) <u>Annexure-16</u>

Suggestions by Members

1. Members have appreciated the overall scheme and also appreciated the concept of Novel engaging course.
2. Members suggested that in Self-study/Seminar courses the offered subjects should be increased. House has accepted and more subjects are added in the list.
3. Experts suggested that in Courses for "Minor Specialization" - *V Semester, at least two courses from two domains should be offered under* domain specialization courses so that student may choose two courses from same domain. Suggestion is accepted and implemented.
4. Subject- *Theory of Computation (Code-150503)* Syllabus has been revised.

ANNEXURE – I

Syllabi
of
Departmental Elective (DE) Courses
B.Tech VII Semester
(Computer Science & Engineering)
Under Flexible Curriculum
[ITEM-1]

Department of Computer Science and Engineering
NETWORKING WITH TCP/IP
150711 (DE-3)

COURSE OBJECTIVES

- To build an understanding of the fundamental concepts of TCP/IP with computer networking.
- To familiarize the student with the basic taxonomy and terminology of the TCP/IP area.
- To understand the network traffic, congestion, controlling and resource allocation.

Unit-I

Introduction : ARPANET, ISDN and Broadband ISDN, Protocols and Standards, Internet Administration , ATM Model, SONET & SDH, TCP/IP Protocol Suite, Network Addressing at various layer

Unit-II

IP Layer: Connection Oriented & Connection less Internet Working, IPV4 Addressing, Subnetting, Supernetting. Delivery and Forwarding of IP Packets, IPv4,IPV6, ARP, RARP, ICMPv4, IGMP, Mobile IP, Unicast Routing Protocols (RIP, OSPF, and BGP), Multicasting and Multicast Routing Protocols.

Unit-III

TCP and UDP Layer: TCP Reliable data transfer, Connection Establishment & Release, TCP Frame, Header Checksum, Sliding Window Concept for error control, congestion control and TCP timer, UDP Format, Pseudo header, Encapsulation, Checksum, Multiplexing & Demultiplexing. Stream Control Transmission Protocol.

Unit- IV

Application Layer: Client-Server Paradigm, DHCP, DNS, TELNET, FTP, TFTP, World Wide Web and HTTP, Electronic Mail: SMTP, POP, IMAP, and MIME, SNMP, BOOTP.

Unit-V

Multimedia and Next Generation Protocol: Voice over IP, Real Time Transport Protocol, IPv6 Addressing, IPv6 Protocol, ICMPv6, Firewall, PGP, HTTPS.

RECOMMENDED BOOKS

- Data and Computer Communication, W. Stalling, Pearson
- Internetworking with TCP/IP - Vol. – I, D.E. Comer, PHI
- Data Communication & Networking, B.A. Forouzan
- ISDN and Broad band ISDN with Frame Relay & ATM, W. Stalling
- LANs, Keiser

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. define the concept of computer network and various layered architecture.

CO2. compare the classless and class full addressing of IPV4 .

CO3. identify the different types of networking devices and their functions within a network.

CO4. analyze various protocols of computer networks for assisting network design and implementation.

CO5. design client server applications and communication model and protocols for communication.

CO6. elaborate various TCP/IP protocol for achieving multimedia and security services.

Department of Computer Science and Engineering

DATA MINING & WAREHOUSING
150712 (DE-3)

COURSE OBJECTIVES

- To understand the value of data mining in solving real-world problems.
- To gain understanding of algorithms commonly used in data mining tools.
- To develop ability for applying data mining tools to real-world problems.

Unit - I

Introduction: Motivation, important, Data type for Data Mining: Relational Databases, Data Ware-Houses. Transactional Databases, Advanced Database System and Its Applications, Data Mining Functionalities Concept/Class Description, Association Analysis Classification & Prediction, Cluster Analysis, Outliner Analysis Classification of Data Mining Systems, Major Issues in Data Mining.

Unit - II

Data Warehouse and OLTP Technology for Data Mining: Differences between Operational Database Systems & Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology, Emerging Scenario of Pattern Warehousing System.

Unit - III

Data Pre-processing: Data Cleaning, Data Integration and Transformation, Data Reduction Discretization and Concept Hierarchy Generation. Data Mining Primitives Languages and System Architectures, Concept Description, Characterization and Comparison Analytical Characterization.

Unit - IV

Mining Association Rules in Large Databases: Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single Dimensional Boolean Association Rules from Transactional Databases: The Apriori Algorithm, Generating Association Rules from Frequent Items, Improving the Efficiency of Apriori, other Algorithms &

their Comparison, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint Based Association Rule Mining.

Unit - V

Classification & Predication and Cluster Analysis: Issues Regarding Classification & Predication, Different Classification Methods, Predication, Cluster Analysis, Major Clustering Methods, Currently Available Tools, Case Study.

RECOMMENDED BOOKS

- Data Mining: Concepts and Techniques, Han and Kamber, Morgan Kaufmann Publications.
- Data Mining Techniques, A. K. Pujari, Universities Press Pvt. Ltd.

COURSE OUTCOMES
After completion of this course, the students would be able to:
CO1. classify various databases systems and data models of data warehouse.
CO2. compare various methods for storing & retrieving data from different data sources/repository.
CO3. apply pre-processing techniques for construction of data warehouse.
CO4. analyse data mining for knowledge discovery & prediction.
CO5. explain data mining methods for identification of association for transactional databases.
CO6. develop various classification and clustering algorithms for data using data mining.

Department of Computer Science and Engineering
DISTRIBUTED SYSTEMS
150713 (DE-3)

COURSE OBJECTIVES

- To provide students contemporary knowledge of distributed systems.
- To equip students with skills to analyze and design distributed applications.
- To gain experience in the design and testing of a large software system, and to be able to communicate that design to others.

Unit - I

Introduction to Distributed Systems: Architecture for Distributed System, Goals of Distributed System, Hardware and Software Concepts, Distributed Computing Model, Advantages & Disadvantage Distributed System, Issues in Designing Distributed System.

Unit -II

Distributed Share Memory: Basic Concept of Distributed Share Memory (DSM), DSM Architecture & Its Types, Design & Implementations Issues in DSM System, Structure of Share Memory Space, Consistency Model and Thrashing.

Unit - III

Distributed File System: Desirable Features of Good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault Tolerance.

Unit - IV

Inter Process Communication and Synchronization: Data Representation & Marshaling, Group Communication, Client Server Communication, RPC-Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms - Bully & Ring Algorithms.

Unit - V

Distributed Scheduling and Deadlock Distributed Scheduling- Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock- Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms. Case Study of Distributed System: Amoeba, Mach, Chorus.

RECOMMENDED BOOKS

- Distributed Operating System Concept & Design, Sinha, PHI .
- Distributed System Concepts and Design, Coulouris & Dollimore, Pearson Pub.
- Distributed Operating System, Andrew S. Tanenbaum, Pearson.

COURSE OUTCOMES
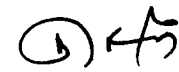
After completion of this course, the students would be able to:
CO1. Tell the basic elements and concepts related to distributed system technologies
CO2. Demonstrate knowledge of the core architectural aspects of distributed systems.
CO3. Identify how the resources in a distributed system are managed by algorithm.
CO4. Examine the concept of distributed file system and distributed shared memory.
CO5. Compare various distributed system algorithms for solving real world problems.
CO6. Develop application for achieving various services of distributed system

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Annexure-2

Scheme of
B.Tech VII
For batch admitted 2018-19
(Computer Science & Engineering)
Under Flexible Curriculum
[Item-1]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Scheme of Examination
B.Tech. VII Semester (Computer Science and Engineering) *for batch admitted in Academic Session 2018-19*

S. No.	Subject Code	Category	Subject Name & Title	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits
				Theory Slot			Practical Slot		MOOCs						
				End Sem.	Mid Sem. Exam	Quiz/ Assignment	End Sem.	Lab Work & Sessional	Assignment	Exam		L	T	P	
1.	DE	DE	Departmental Elective (DE-3)	70	20	10	-	-	-	-	100	3	-	-	3
2.	DE	DE	Departmental Elective (DE-4)	-	-	-	-	-	25	75	100	2	-	-	2
3.	OC	OC	Open Category (OC-2)	70	20	10	-	-	-	-	100	2	1	-	3
4.	OC	OC	Open Category (OC-3)	70	20	10	-	-	-	-	100	3	-	-	3
5.	100008	MC	Intellectual Property Rights (IPR) (MC)	70	20	10	-	-	-	-	100	2	-	-	2
6.	150701	DLC	Departmental Lab (DLC-6)	-	-	-	50	50	-	-	100	-	-	4	2
7.	150702	DLC	Summer Internship Project-III (04 weeks) (Evaluation) (DLC-7)	-	-	-	50	50	-	-	100	-	-	4	2
8.	150703	DLC	Creative Problem Solving (Evaluation) (DLC-8)	-	-	-	25	25	-	-	50	-	-	2	1
	Total			280	80	40	125	125	25	75	750	12	1	10	18
Additional Courses for obtaining Honours or minor Specialization by desirous students			Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization												

DE -3 (Through Traditional Mode)		
S. No.	Subject Code	Subject Name
1.	150711	Networking with TCP/IP
2.	150712	Data Mining & Warehousing
3.	150713	Distributed Systems

DE -4*		
S. No.	Subject Code	Subject Name
1.	150754	Cloud Computing
2.	150755	Deep learning - IITRopar
3.	150756	Software Testing

OC-2		
S. No.	Subject Code	Subject Name
1.	900208	Soft Computing
2.	900209	Network Security

OC-3		
S. No.	Subject Code	Subject Name
1.	900220	R Programming
2.	900222	Computer Networks

Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

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List of courses to be opted for Honours or Minor specialization in VII Semester

Honours* (to be opted by students of Parent Department)	Minor Specialization* (to be opted by students of Other Department)
Deep Learning for Computer Vision	Computer Graphics
Big Data Computing	Theory of Computation
Parameterized Algorithms	Software Testing

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

<u>Annexure-3</u>

Syllabi
of
Open Category (OC) Courses
offered by Department of CSE in
B.Tech VII Semester
Under Flexible Curriculum

[ITEM-3]

Department of Computer Science and Engineering
SOFT COMPUTING
900208 (OC-2)

COURSE OBJECTIVES

- To provide the student with the basic understanding of neural networks and fuzzy logic fundamentals, Program the related algorithms and Design the required and related systems.

- To understand the fundamental theory and concepts of neural networks, neuro-modeling, several neural network paradigms and its applications.

- To understand the basics of an evolutionary computing paradigm known as genetic algorithms and its application to engineering optimization problems.

Unit-I

Introduction and Fundamental Concept of ANN: Basic models of Artificial Neural Networks, Terminologies of ANNs McCulloch-Pitts Neurons, Linear Separability, Hebb Network, **Supervised Learning Networks:** Introduction, Perceptron Networks, Back Propagation Networks, Radial Basis Function Networks, Hopefield networks.

Unit-II

Unsupervised Learning: Fixed weight Competitive Nets, Kohonen Self-Organizing Map, Learning vector quantization. Counter propagation Networks, Adaptive Resonance Theory Network.

Unit-III

Fuzzy Set Theory: Fuzzy Sets, Fuzzy Membership Functions, Operations on Fuzzy Sets, Fuzzy Relations, Fuzzy rules, Fuzzy Reasoning, **Defuzzification:** Lembda-Cuts for Fuzzy sets (Alpha-Cuts), Lembda-Cuts for Fuzzy Relations. Fuzzy Inference System: Introduction, Mamdani Fuzzy Model, Takagi-Sugeno Fuzzy Model.

Unit-IV

Introduction: Biological Background, Traditional optimization and Search Techniques, Basic Terminologies in GA, Operators in Genetic Algorithm, Stopping Condition for

Genetic Algorithm Flow, Classification of Genetic Algorithm, Comparison with Evolutionary algorithm, Application of Genetic algorithm.

Unit-V

Hybrid Soft Computing Techniques: Introduction, Neuro-fuzzy Hybrid system, Adaptive Neuro fuzzy inference system(ANFIS), Genetic Neuro Hybrid system, Application of Soft Computing Techniques.

RECOMMENDED BOOKS

- Principles of Soft Computing, S. N. Sivanandam and S. N. Deepa , Wiley
- Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications-S. Rajasekaran & G.A. Vijayalakshmi Pai, PHI.
- Introduction to Soft Computing Neuro-Fuzzy and Genetic Algorithms, Samir Roy and Udit Chakraborty, Pearson.
- Neural Networks and Learning Machines-Simon Haykin PHI.
- Fuzzy Logic and Engineering Application, Tomthy Ross, TMH

COURSE OUTCOMES

After completion of this course, the students would be able to:
CO1.   define basic concepts of neural network and fuzzy systems.
CO2.   compare solutions by applying various soft computing approaches on a given problem.
CO3.   develop and train different supervised and unsupervised learning.
CO4.   classify various nature inspired algorithms according to their application aspect.
CO5.   compare the efficiency of various hybrid systems.
CO6.   design a soft computing model for solving real world problems.

Department of Computer Science and Engineering

R PROGRAMMING
900220 (OC-3)

COURSE OBJECTIVES

- To understand the critical programming language concepts.
- To perform data analysis using R commands.
- To make use of R loop functions and debugging tools.

Unit-I

Introduction to R: R Commands, Objects, Functions, Simple Manipulations, Matrices and Arrays, Factors, Lists, Data Frames.

Unit-II

Programming Using R: Introduction, Function Creation, Scripts, Logical Operators, Conditional Statements, Loops in R, Switch Statement, Creating List and Data Frames, List and Data Frame Operations, Recursive List.

Unit-III

Object- Oriented Programming in R: Introduction, S3 Classes, S4 Classes, References Classes, Debugging Principle in R, Import and Export Data from CSV, SAS and ODBC.

Unit-IV

Mathematical and Statistical Concepts, Hypothesis Testing, Different Statistical Distribution, Regression, Time Series Analysis.

Unit-V

Graphics in R: Basic Plots, Labelling and Documenting Plots, Adjusting the Axes, Specifying Colour, Fonts and Sizes, Plotting symbols, Customized Plotting, Packages in R for Windows, Linus and Mac.

RECOMMENDED BOOKS

- "R for Beginners", Sandip Rakshit, Tata Mc Graw Hill Education.
- "R programming for Data Science", Roger D. Peng, Learn publishing.
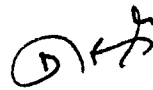
COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. define basic programming constructs used in R.

CO2. explain the various commands used in R.

CO3. apply various concept of programming for controlling the flow of data using R.

CO4. analyze the concept of concept of object oriented programming in R.

CO5. choose appropriate packages of R programming for dealing various tasks.

CO6. predict results from the datasets using R commands.

Department of Computer Science and Engineering

COMPUTER NETWORKS
900222 (OC-3)

COURSE OBJECTIVES

- Familiarize the student with the basic taxonomy and terminology of the computer networking.

- Provide detail knowledge about various layers, protocols and devices that facilitate networking.

- Enable Students to deal with various networking problems such as flow control, error control and congestion control.

Unit-I

Introduction: Computer Network, Types- LAN,MAN & WAN, Data Transmission Modes- Serial & Parallel, Simplex, Half Duplex & Full Duplex, Synchronous & Asynchronous Transmission, Transmission Medium- Guided & Unguided, Cables- Twisted Pair, Coaxial Cable & Optical Fiber, Networking Devices-Repeaters, Hub, Switch, Bridge, Router, Gateway and Modem, Performance Criteria- Bandwidth, Throughput, Propagation Time & Transmission Time, Network Standardization- OSI Reference Model & TCP/IP Reference Mode.

Unit-II

Physical Layer: Network Topologies- Bus, Ring, Star & Mesh, Line Coding- Unipolar, Polar and Bipolar, Switching- Circuit Switching, Message Switching & Packet Switching, Multiplexing: FDM – Frequency Division Multiplexing, WDM – Wavelength Division Multiplexing & TDM – Time Division Multiplexing.

Unit-III

Data Link Layer: Introduction, Design Issues, Services, Framing, Error Control, Flow Control, ARQ Strategies, Error Detection and Correction, Parity Bits, Cyclic Redundant Code (CRC), Hamming Codes, MAC Sub Layer- The Channel Allocation Problem, Pure ALOHA ,Slotted ALOHA, CSMA ,CSMA/CD, IEEE 802.3, IEEE 802.4 and IEEE 802.5.

Unit-IV

Network Layer & Transport Layer: Introduction, Design Issues, Services, Routing- Distance Vector Routing, Hierarchical Routing & Link State Routing, Shortest Path Algorithm- Dijkstra's Algorithm & Floyd–Warshall's Algorithm, Flooding, Congestion Control- Open Loop & Closed Loop Congestion Control, Leaky Bucket & Token Bucket Algorithm. Connection Oriented & Connectionless Service, IP Addressing.

Unit-V

Presentation, Session& Application Layer: Introduction, Design Issues, Presentation Layer- Translation, Encryption- Substitutions and Transposition Ciphers, Compression- Lossy and Lossless. Session Layer – Dialog Control, Synchronization. Application Layer- Remote Login, File Transfer & Electronic Mail.

RECOMMENDED BOOKS

- Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill.
- Computer Networks, Andrew S. Tanenbaum, Pearson Education India.
- Computer Networks and Internets, Douglas E. Comer, Pearson India.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. explain the fundamental concepts of computer network.
CO2. illustrate the basic taxonomy & terminologies of computer network.
CO3. identify various parameter for affecting the performance of computer network.
CO4. analyze the concepts of communication using various layer of OSI model.
CO5. evaluate the performance of computer network in congestion and Internet.
CO6. design the network environment and applications for implementation of computer networking concept.

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Scheme of
B.Tech V
For batch admitted 2019-20
(Computer Science & Engineering)
Under Flexible Curriculum
[Item-VI]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Scheme of Examination
B.Tech. V Semester (Computer Science & Engineering)

For batches admitted in Academic Session 2019-20

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours per week			Total Credits
				Theory Slot			Practical Slot			L	T	P	
				End Sem.	Mid Sem Exam.	Quiz/ Assisgnment	End Sem.	Lab work & Sessional					
1.	100005*	HSMC-4	Ethics, Economics, Entrepreneurship& Management	70	20	10	-	-	100	3	-	-	3
2.	150501	BSC- 6	Discrete Structures	70	20	10	-	-	100	3	1	-	4
3.	150502	DC-9	Software Engineering	70	20	10	30	20	150	2	1	2	4
4.	150503	DC-10	Theory of Computation	70	20	10	30	20	150	2	1	2	4
5.	150504	DC-11	Microprocessor & Interfacing	70	20	10	30	20	150	2	1	2	4
6.	150505	DLC-3	Minor Project-I**	-	-	-	30	20	50	-	-	2	1
7.	150506	DLC-4	Summer Internship Project-II (Evaluation)	-	-	-	25	-	25	-	-	6	3
8.	150507	SEMINAR/ SELF STUDY	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)*	-	-	-	-	25	25	-	-	2	1
	Total			350	100	50	145	105	750	12	4	16	24
9.	100006*	MC-3	Indian Constitution & Traditional Knowledge (Audit Course)	70	20	10	-	-	100	3		-	03

Department level activity/workshop/awareness programme to be conducted; certificate of compliance to be submitted by HoD to the Exam Controller through Dean Academics

Additional Course for Honours or minor Specialization	Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization

Group A/B programmes will offer this course in V/VI Semester respectively.

Group A/B programmes will offer this course in V/VI Semester respectively. (This is a non-credit course and it is optional to appear & pass in the end semester examination. However, a separate mark sheet will be issued to those who will qualify)

The minor project-I may be evaluated by an internal committee for awarding sessional marks.

Compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance, assignments and presentation

GROUP A: (Electrical, Electronics. Computer Science & Engineering. Information Technology. Electronics & Telecommunication)

GROUP B: (Civil. Mechanical. Chemical. Biotech. Automobile)

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List of courses to be opted for Honours or Minor specialization in V Semester

Honours* *(to be opted by students of Parent Department)*	Minor Specialization* *(to be opted by students of Other Department)*
Cloud computing	Programming in C++
Advanced computer architecture	Programming, Data Structures and Algorithms in Python
The Joy of Computing using Python	Introduction to Operating Systems
	Cloud Computing

* **Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform**

For Sr No8 in Scheme of Vth Sem

150507	SEMINAR/ SELF STUDY	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)"	Course ID: noc21-cs78	Python for Data Science
			Course ID: noc21-cs103	Introduction to Quantum Computing: Quantum Algorithms and Qiskit
			Course ID: noc21-mg57	Gender justice and workplace security
			Course ID: noc21-mg74	Decision-Making Under Uncertainty

Department of Computer Science and Engineering

SOFTWARE ENGINEERING
150502 (DC-9)

COURSE OBJECTIVES

- To understand the nature of software development and software life cycle process models, agile software development, SCRUM and other agile practices.
- To understand project management and risk management associated with various types of projects.
- To know basics of testing and understanding concept of software quality assurance and software configuration management process.

Unit - I

Introduction to Software Engineering: Definition, software engineering-layered Technology, Software Characteristics and Components, **Software model:** Software Development of Life Cycle Model (SDLC), The Waterfall Model, Iterative Waterfall Model, Prototyping Model, Spiral Model, RAD Model. **Selection criteria of model:** Characteristics of Requirements, Status of Development Team, Users participation, Type of Project and Associated Risk.

Unit - II

Requirement Engineering: Definition, Requirement Engineering Activity, **Types of Requirement-** Functional and Non-functional Requirements, User and System Requirements, Requirement Elicitation Methods, Requirement Analysis Methods, Requirement Documentation (SRS), Requirement Validation, Requirement Management.

Unit - III

Design Concept, Principle and Methods: Design Fundamentals, Design Principles, Effective Modular Design, Design Representations, Architectural design, Procedural design, data Directed design, Real Time Design, Object Oriented Design, Coupling and Cohesion.

Unit - IV

Software Metrics, Project Management and Estimation: Metrics in Process and Project domains. Software Measurement. Software Quality Metrics. **Project Management** Basics People, Product, Process, Project, **Estimation** Software Project Estimation, Decomposition Techniques- Function Point Estimation. Line of Code (LOC) based estimation, Empirical Estimation. COCOMO Model. Project Scheduling Techniques.

Unit - V

Software Testing: Definitions, Software Testing Life Cycle (STLC), , Test Case Design, Strategic Approach to Software Testing- Verification & Validation , Strategic issues, Criteria for completion of Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Black Box Testing Techniques, White Box Testing Techniques, Acceptance Testing.

RECOMMENDED BOOKS

- Software Engineering, Sommerville, Pearson.
- Software Engineering: A Practitioner's Approach, Roger S. Pressman, McGraw Hill.
- Software Engineering, K.K. Agrawal & Yogesh Singh, New Age Publication.
- Software Engineering. Rajib Mall, PHI.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. explain the various fundamental concepts of software engineering.

CO2. develop the concepts related to software design & analysis.

CO3. compare the techniques for software project management & estimation.

CO4. choose the appropriate model for real life software project.

CO5. design the software using modern tools and technologies.

CO6. test the software through different approaches.

Department of Computer Science and Engineering
THEORY OF COMPUTATION
150503 (DC-10)

COURSE OBJECTIVE

- To understand computability, decidability, and complexity through problem solving.

- To analyse and design abstract model of computation & formal languages

- To understand and conduct mathematical proofs for computation and algorithms.

Unit-I

Introduction to Theory of Computation: Automata, Computability and Complexity, Alphabet, Symbol, String, and Formal Languages, Examples of automata machines. Finite Automata as a language acceptor and translator. Moore machines and Mealy machines. Composite Machine, Conversion from Mealy to Moore and vice versa.

Unit-II

Types of Finite Automata: Non Deterministic Finite Automata (NDFA), Deterministic finite automata machines, conversion of NDFA to DFA, minimization of automata machines, regular expression, Arden's theorem. Pumping lemma, applications. Closure properties of regular languages. 2 way DFA.

Unit-III

Grammars: Types of grammar, context sensitive grammar, context free grammar, and regular grammar, Derivation trees, Rightmost and Leftmost derivations of Strings, ambiguity in grammar, simplification of context free grammar, killing null and unit productions, conversion of grammar to automata machine and vice versa, Chomsky hierarchy of grammar, Chomsky Normal Form (CNF) and Greibach Normal Form (GNF).

Unit-IV

Push down Automata: Definition, Model, Acceptance of CFL, Acceptance by Final State and Empty stack, Designing of PDA, deterministic and non-deterministic PDA, conversion of PDA into context free grammar and vice versa, CFG equivalent to PDA, Context sensitive language and linear bounded automata (LBA).

Unit-V

Turing Machine: Techniques for construction. Universal Turing machine. Multitape, multihead and multidimensional Turing machine. N-P complete problems, Decidability and Recursively Enumerable Languages, decidable languages, un decidable languages. Halting problem of Turing machine & the post correspondence problem (PCB).

RECOMMENDED BOOKS

- Introduction to Automata Theory Language & Computation, Hopcroft & Ullman, Narosa Publication.
- Element of the Theory Computation, Lewis & Christors, Pearson.
- Theory of Computation, Chandrasekhar & Mishra. PHI.
- Theory of Computation, Wood, Harper & Row.
- Introduction to Computing Theory, Daniel I-A Cohen, Wiley.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. explain the basic concepts of switching and finite automata theory & languages.

CO2. relate practical problems to languages, automata, computability and complexity.

CO3. construct abstract models of computing and check their power to recognize the languages.

CO4. analyse the grammar, its types, simplification and normal form.

CO5. interpret rigorously formal mathematical methods to prove properties of languages, grammars and automata.

CO6. develop the abstract models for engineering applications using automata theory, and languages

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Department of Computer Science and Engineering

MICROPROCESSOR & INTERFACING
150504 (DC-11)

COURSE OBJECTIVES

- To understand different processors and basic architecture of 16 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand 8051 microcontroller.

Unit-I

Microprocessors: Introduction to x86 microprocessors, RISC and CISC processors, 8086 Architecture-Functional Diagram, Register Organization, Memory Segmentation, Programming Model, Memory Address, Physical Memory Organization, Minimum and maximum mode signals, Bus Cycle and Timing Diagrams, Instruction Formats, Addressing Modes, Instruction Set, Interrupts of 8086.

Unit-II

Basic Peripherals and Interfacing: 8212, 8155, 8255, 8755, interfacing with LED's, ADC, DAC, stepper motors and I/O & Memory Interfacing.

Unit-III

Special Purpose Programmable Peripheral Devices and Interfacing: 8253, 8254 programmable interval timer, 8259A programmable interrupt controller and 8257 DMA controllers, Keyboard and Display Interfacing.

Unit-IV

Serial and Parallel Data Transfer: Serial and Parallel data transmission, Types of communication system, Baud rate RS-232C, Modem and various bus standards, USART – 8251A.

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Unit-V

Introduction to Microcontrollers: 8051 Microprocessor and its Architectures, Pin Description, Input-Output configurations, Interrupts, Addressing Modes. An overview of 8051 Instruction Set.

RECOMMENDED BOOKS

- The Intel Microprocessors, Architecture, Programming and Interfacing, B.B. Brey, PHI.
- Microprocessor 8086: Architecture, Programming and Interfacing, Sunil Mathur, PHI.
- Advanced Microprocessor and Interfacing, D.V. Hall, Mc-Graw Hill.
- Advanced Microprocessor and Peripherals – Architecture, Programming and Interfacing, A.K. Ray & K.M. Bhurchandi, Tata McGraw Hill.
- Interfacing Techniques in Digital Design with Emphasis on Microprocessors, R.L. Krutz, John Wiley.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. compare the architecture and feature of different 16-bit microprocessor interfacing chips & microcontrollers.

CO2. develop programming skills in assembly language of 8086 microprocessor and 8051 microcontroller.

CO3. demonstrate the concept of interfacing with peripheral devices.

CO4. make use of different interrupts and addressing modes.

CO5. design an interfacing for I/O devices.

CO6. build a system based on 8086 microprocessor and 8051 microcontroller.

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Annexure-5(a)

Scheme of
B.Tech III & IV Semester
For batch admitted 2020-21
(Computer Science and Engineering)
Under Flexible Curriculum
[Item-7]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Scheme of Examination
B.Tech. III Semester (Computer Science and Engineering)

For batches admitted in Academic Session 2020-21 onwards

S. No.	Subject Code	Category Code	Subject Name	End Sem. Exam	Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment	End Sem. Exam	Lab Work & Sessional	Skill based mini project	Total Marks	L	T	P	Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam
				Theory Slot				**Practical Slot**									
				End Term Evaluation		Continuous Evaluation			Continuous Evaluation								
1.	100025	BSC	Engineering Mathematics-II	50	10	20	20	-	-	-	100	3	-	-	3	Offline (3/0)	PP
2.	150311	DC	Computer System Organization	50	10	20	20	-	-	-	100	2	1	-	3	Blended(2/1)	PP
3.	150312	DC	Operating Systems	50	10	20	20	-	-	-	100	2	1	-	3	Blended(2/1)	PP
4.	150313	DC	Computer Graphics	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	PP
5.	150314	DC	Design & Analysis of Algorithms	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	PP
6.	150315	DLC	Computer Hardware & Troubleshooting Lab	-	-	-	-	60	20	20	100	-	-	4	2	Offline	SO
7.	150316	SEMINAR/ SELF STUDY	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)#	-	-	-	-	-	40		40			2	1	Online + Mentoring	SO
8.	200XXX	CLC	Novel engaging courses	-	-	-	-	50			50	-	-	2	1	Interactive	SO
9.	150317	DLC	Summer Internship Project –I (Institute Level) (Evaluation)	-	-	-	-	60			60			4	2	Offline	SO
			Total	250	50	100	100	290	100	60	950	11	4	16	23		-
10.	1000002	MAC	Biology for Engineers (Mandatory Audit Course)$$	50	10	20	20	-	-	-	100	2	-	-	Grade	Online	MCQ

MCQ: Multiple Choice Question AO: Assignment + Oral   OB: Open Book   PP: Pen Paper   SO: Submission &Oral   CLC:College level course
#compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance, assignments and presentation, Additional Foundation course for branch change students, AC-06 dated05/12/2020
*subjects which are of more theoretical in nature , **subjects which are of more designing/algorithmic/computational in nature,***subjects which are of partially computational/design /programming nature (i.e. conceptual building part can be covered in online mode + computing /design part in offline mode or for MOOC based courses, the mentoring slot can be treated as offline mode delivery of partial contents to make the teaching learning "Blended"),$Proficiency in course/subject – includes the weightage towards ability/ skill/ competence /knowledge level /expertise attained /attendance ,one minute paper writing etc. in that particular course/subject,$$ Course will run for Group A/B in III/IV semester respectively. Passing is optional; however, a separate mark sheet will be issued to those who qualify.

Mode of Teaching					Mode of Examination					Total Credits
Theory				Lab	NEC	Theory			Lab	SIP/ SLP/ NEC	
Offline	Online	Blended		Offline	Interactive	PP	A+O	MCQ	SO	SO	
		Offline	Online								
3	-	8	4	7	1	17	-	-	2	4	23
13.04	-	34.78	17.39	30.43	4.34	73.91	-	-	8.69	17.39	Credits %

ACADEMICS
M.T.S

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Scheme of Examination
B.Tech. IV Semester (Computer Science and Engineering)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam
				Theory Slot				Practical Slot				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation								
				End Sem. Exam	$^\$$Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment		Lab Work & Sessional	Skill based mini project							
1.	150411	DC	Computer Networks	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	PP
2.	150412	DC	Database Management System	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	PP
3.	150413	DC	Software Engineering	50	10	20	20	-	-		100	3	-	-	3	Blended (2/1) MCQ	PP MCQ
4.	150414	DC	Theory of Computation	50	10	20	20	-	-		100	2	1	-	3	Blended (2/1)	PP
5.	150415	DLC	Programming Lab* Python Programming	-	-	-	-	60	20	20	100	-	-	4	2	Offline	SO
6.	150416	DC	Discrete Structures	50	10	20	20	-	-	-	100	3	-	-	3	Offline (3/0)	PP
7.	2000XXX	CLC	Novel engaging courses					-	50		50	-	-	2	1	Interactive	SO
	Total			250	50	100	100	180	110	60	850	13	2	10	20		
8.	1000001	MAC	Indian Constitution and Traditional Knowledge(Mandatory Audit Course) $$	50	10	20	20	-	-	-	100	2	-	-	Grade	Online	MCQ
			Summer Internship Project-II (Soft skills Based) for two weeks duration: Evaluation in V Semester														

MCQ: Multiple Choice Question   AO: Assignment + Oral   OB: Open Book   PP: Pen Paper   SO: Submission & Oral   CLC: College level course

#compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance, assignments and presentation,
*subjects which are of more theoretical in nature , **subjects which are of more designing/algorithmic/computational in nature,***subjects which are of partially computational/design /programming nature (i.e. conceptual building part can be covered in online mode + computing /design part in offline mode or for MOOC based courses, the mentoring slot can be treated as offline mode delivery of partial contents to make the teaching learning "Blended"),$Proficiency in course/subject – includes the weightage towards ability/ skill/ competence /knowledge level /expertise attained /attendance ,one minute paper writing etc. in that particular course/subject,$$ Course will run for Group A/B in III/IV semester respectively. Passing is optional; however, a separate mark sheet will be issued to those who qualify.

Mode of Teaching						Mode of Examination					Total Credits
Theory				Lab	NEC	Theory			Lab	SIP/ SLP/ NEC	
Offline	Online	Blended		Offline	Interactive	PP	A+O	MCQ	SO	SO	
		Offline	Online								
3	-	8	4	4	1	17 14	-	-03	2	1	20
15	-	40	20	20	5	85 70	-	-15	10	5	Credits %

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Department of CSE
OOP and Methodology (150212)

LIST OF SKILL-BASED MINI-PROJECTS

1. 'Movie World' Shop has a huge collection of movies (in the form of DVDs). You are required to make software using OOPS paradigm that manages the rental operations of movies.

2. Question Bank computerizes the MCQ based exams. It takes input from a file having questions and their answers and presents randomly before the exam takers. Use OOPS concepts to implement the question bank system.

3. Design an OOPS to implement the basic operations of Leave Management System.

4. An Inventory System computerizes the Stock, Sale and Purchase of goods. Design an OOPS to implement it.

5. An electricity board charges the following rates to domestic users to discourage large consumption of energy: For the first 100 units - 60P per unit For next 200 units - 80P per unit Beyond 300 units - 90P per unit All users are charged a minimum of Rs.50.00. if the total amount is more than Rs.300.00 than an additional surcharge of 15% is added. Design an OOPS system to register users to the system, maintain his/her record and display monthly bills.

6. Library Systems is aimed to computerize the library management operations, e.g. Registering a Student, Issuing a book, Handling Books Return, etc. Design an OOPS system to implement the same.

7. Design an OOPS to implement a Personal Diary Management System.

Please Note: Each project has to be submitted by a group of 3 to 4 students, and each group will be assigned only one project.

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List of Courses offered for Self-Study/Seminar in III Sem (2020 admitted batch)

150316	SEMINAR/ SELF STUDY	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)#	Course ID: noc21-cs81	C Programming and Assembly Language
			Course ID: noc21-hs70	Patent Drafting for Beginners
			Course ID: noc21-ge18	Stress Management
			Course ID: noc21-mg74	Decision-Making Under Uncertainty

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<u>**Annexure-5(b)**</u>

Syllabi of
Departmental Courses (DC) Courses
B.Tech III Semester
For batch admitted 2020-21
(Computer Science and Engineering)
Under Flexible Curriculum
[Item-7]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR-474005

(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)

Department of Computer Science and Engineering

COMPUTER SYSTEM ORGANIZATION
150311 (DC)

COURSE OBJECTIVES

- To provide the fundamental knowledge of a computer system and its processing units.

- To provide the details of input & output operations, memory management and performance measurement of the computer system.

- To understand how computer represents and manipulate data.

Unit -I

Introduction: Von-Neumann Model, Various Subsystems, CPU, Memory, I/O, System Bus, CPU and Memory Registers, Program Counter, Accumulator, Register Transfer and Micro Operations: Register Transfer Language, Register Transfer, Tree-State Bus Buffers, Bus and Memory Transfers, Arithmetic Micro-Operation, Logic Micro-Operation, Shift Micro- Operation Register Transfer Micro Operations, Arithmetic Micro-Operations, Logic Micro- Operations and Shift Micro-Operations.

Unit- II

Computer Arithmetic: Addition and Subtraction with Signed-Magnitude, Multiplication Algorithm, Division Algorithm, Division Algorithms, Floating-Point Arithmetic Operations.

Central Processing Unit (CPU): General Purpose Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC).Hardwired and Micro programmed Control.

Unit -III

Microprocessors: Introduction of 8085 Microprocessor: Architecture, Instruction Set, Addressing Modes, Interrupts and Basic Assembly Language Programming.

Unit -IV

Input-Output Organization: Peripheral Devices, I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA (DMA Controller, DMA Transfer),

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Input-Output Processor (IOP), Data Transfer- Serial/Parallel, Simplex/ Half Duplex/ Full Duplex.

Unit-V

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory- Organization and Mappings, Memory Management Hardware, Introduction to Pipelining & Multiprocessors.

RECOMMENDED BOOKS

- Computer System Architecture, Morris Mano, PHI.
- Microprocessor Architecture, Programming and Applications with the 8085, Gaonkar,
- Computer Organization, Carl Hamacher, THM.
- Computer Architecture and Organization, J P Hayes, Mc-Graw Hills, New Delhi.

COURSE OUTCOMES

After completion of the course students would be able to:

CO1. Recall the basic building blocks of computer Architecture.
CO2. Explain different memories and the functional units of a processor.
CO3. Explain the concept of working of microprocessor, multiprocessor and pipelining.
CO4. Analyze various modes of Input-Output data transfer.
CO5. Evaluate the arithmetic related to the number system.
CO6. Develop the skill of writing low level programming.

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Department of Computer Science and Engineering

OPERATING SYSTEMS
150312 (DC)

COURSE OBJECTIVES
- Provide basic knowledge of computer operating system structures and functioning.
- Compare several different approaches to memory management, file management and process management
- Understand various problems related to concurrent operations and their solutions.

Unit- I

Basics of operating systems: Generations, Types, Structure, Services, System Calls, System Boot, System Programs, Protection and Security.

Process management: Process Concepts, Process States, Process Control Block, Scheduling-Criteria, Scheduling Algorithms and their Evaluation, Threads, Threading Issues.

Unit-II

Process synchronization: Background, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors.

Deadlock: System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery form Deadlock.

Unit-III

Memory management: Main Memory, Swapping, Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation, Virtual Memory, Demand Paging, Page Replacement Algorithms, Allocation of Frames, Thrashing.

Unit-IV

Storage management: Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, RAID Structure.

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Unit-V

File system interface: File Concept, Access Methods, Directory Structure, File System Structure, Allocation Methods, and Free-Space Management.

System Protection: Goals. Principles. Domain of Protection. Access Matrix. Access Control.

RECOMMENDED BOOKS

- Operating System Concepts, Silberschatz, Ninth Edition, Willey Publication.
- Operating Systems, Internals and Design Principles, Stallings, Seventh Edition, Pearson Publication.
- Modern Operating Systems, Tanenbaum, Fourth Edition. Pearson Publication.

COURSE OUTCOMES

After the successful completion of this course, the student will be able to:

CO1. Outline the basic concept of operating systems
CO2. Analyze the working of operating system
CO3. Examine the working of various scheduling/allocation approaches
CO4. Measure the performance of various scheduling/allocation approaches
CO5. Analyze the various operating system problems/issues
CO6. Develop the Solution of various operating system problems/issues

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COMPUTER GRAPHICS
150313(DC)

COURSE OBJECTIVES

- To provide an introduction to the theory and practice of computer graphics.
- To give a good exposure related to Computer Graphics algorithms and to design various graphics primitives.
- To enhance the proficiency in programming skills related to animation and graphics object Design

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Unit-I

Introduction to Computer Graphics: Interactive Computer Graphics, Application of Computer Graphics, Random and Raster Scan Displays, Storage Tube Graphics Display, Calligraphic Refresh Graphics Display, Flat Panel Display, Refreshing, Flickering, Interlacing, Resolution, Bit Depth, Aspect Ratio etc.

Unit-II

Scan Conversion Technique: Image representation, Line drawing: DDA, Bresenham's Algorithm. Circle Drawing: General Method, Mid-Point, DDA, Bresenham's Circle Generation Algorithm, And Ellipse Generation Algorithm, Curves: Parametric Function, Bezier Method, B-Spline Method.

Unit-III

2D & 3D Transformations: Translation, Rotation, Scaling, Reflection, Shearing, Inverse Transformation, Composite Transformation, World Coordinate System, Viewing Transformation, Representation of 3D object on Screen, Parallel and Perspective Projections.

Unit-IV

Clipping: Point clipping, Line Clipping, Simple Visibility Line Clipping Algorithm, Cohen Sutherland Line Clipping Algorithm etc., Polygon Clipping, Convex and Concave Polygon, Sutherland Hodgeman Polygon Clipping Algorithm etc., Area Filling, Hidden Surface Elimination: Z- Buffer algorithm and Painter's Algorithm.

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Unit-V

Basic Illumination Models: Diffuse Reflection, Specular Reflection, Phong Shading, Gouraud Shading, and Color Models like RGB, YIQ, CMY, HSV etc., and Introduction to Digital Image Processing (DIP), Fundamental Steps and Components of DIP.

RECOMMENDED BOOKS

- Computer Graphics, Donald Hearn and M.P. Becker, PHI Publication.
- Computer Graphics principle and Practice, FoleyVandam, Feiner, Hughes.
- Principles of Computers Graphics, Rogers, TMH.
- Computer Graphics, Sinha and Udai, TMH.
- Digital Image Processing, Gonzalez.

COURSE OUTCOMES

After completion of the course students will be able to:

CO1. Explain interactive Computer Graphics, various display devices and explore applications of computer graphics.

CO2. Illustrate various line generations, circle generation, curve generation and shape Generation algorithms.

CO3. Apply various 2-Dimensional and 3-Dimensional transformations and projections on Images.

CO4. Classify methods of image clipping and various algorithms for Line and Polygon clipping.

CO5. Choose appropriate filling algorithms, Hidden Surface Elimination algorithm and apply on various images.

CO6. Discuss various color models, shading methods, animation and Digital Image Processing.

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COMPUTER GRAPHICS
150313(DC)

List of Experiments

1. Installation and Introduction to OpenGL basics, graphic functions, commands for compiling and executing an OpenGL Program.
2. Write an OpenGL Program to create an output window, to plot a point with given coordinates and other basic demonstrations.
3. Write an OpenGL Program to implement DDA Line Drawing Algorithm.
4. Write an OpenGL Program to implement Bresenham Line Algorithm.
5. Write an OpenGL Program to implement Mid-Point Circle Algorithm.
6. Write an OpenGL Program to implement following 2D transformations:
    i. Translation of a point, line and polygon.
    ii. Scaling of a line and polygon.
    iii. Rotation of a line and polygon around origin.
7. Write an OpenGL Program to implement:
    i. Flood Filling Algorithm using polygon.
    ii. Boundary Filling Algorithm using polygon.

COURSE OUTCOMES
After completion of the course students will be able to:

CO1. Demonstrates the fundamental concepts of Computer Graphics and its applications.
CO2. Explain and use hardware's and software's component of computer graphics
CO3. Apply various image generation, manipulations and color model techniques in coding.
CO4. Implement algorithms for create and manipulate image in programs.
CO5. Develop the ability to write computer programs for create image and animation using graphics concepts.
CO6. Develop application programs and projects in terms of image and animation using computer graphics.

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DESIGN & ANALYSIS OF ALGORITHMS
150314 (DC)

COURSE OBJECTIVE:

- To introduce the topic of algorithms as a precise mathematical concept.
- To demonstrate the familiarity with major algorithm design paradigms and methods of analysis.
- To design efficient algorithms for common computer engineering problems.
- To enhance the skills using well-known algorithms and data structures for solving real-life problems.

Unit-I

Introduction to Computational Model: RAM model, Algorithms and its importance, Recurrences and Asymptotic Notations, Growth of function, Mathematical Analysis of Non-Recursive and Recursive Algorithm, Review of Sorting & Searching Algorithms, Basic Tree and Graph Concept: Binary Search Trees, Height Balanced Tree, B-Trees and Traversal Techniques.

Unit-II

Divide and Conquer Method: Introduction and its Examples such as Finding the maximum and minimum, Binary Search, Merge Sort, Quick Sort and Strassen's Matrix Multiplication.

Unit-III

Greedy Method: Introduction, Characteristics, greedy activity selection. **Minimum Cost Spanning Trees**: Prim's and Kruskal's Algorithm, knapsack Problem, Single Source Shortest Path: Dijkstra's single source shortest path algorithm, Huffman Coding.

Unit-IV

Dynamic Programming: Introduction, The principle of Optimality, Examples of Dynamic Programming Methods such 0/1 Knapsack, Travelling salesman problem, Floyds All Pairs Shortest Path, Longest Common Subsequence and Reliability Design.

Unit-V

Backtracking: Concept and its Examples like 4-Queen's Problem, Knapsack problem Hamiltonian Circuit Problem, Graph Coloring Problem etc. **Branch and Bound**: Introduction and its Examples like Travelling Salesperson Problem etc. **NP Completeness**: Introduction, Class P and NP, Polynomial Reduction, NP-Hard and NP-Complete problem.

RECOMMENDED BOOKS:

- Fundamentals of Computer Algorithms, Horowitz & Sahani, Universities press
- Introduction to Algorithms, Coreman Thomas, Leiserson CE, Rivest RL, PHI.
- Design & Analysis of Computer Algorithms, Ullman, Pearson.
- Algorithm Design, Michael T Goodrich, Robarto Tamassia, Wiley India.

COURSE OUTCOMES:
After Completion of this course, the students would be able to:

CO1: Tell the basic features of an Algorithms.
CO2: Outline major Algorithms and Data Structures.
CO3: Apply various algorithmic design paradigms.
CO4: Analyze the asymptotic performance of Algorithms.
CO5: Compare different design techniques to develop algorithms for computational problems.
CO6: Design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach.

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DESIGN AND ANALYSIS OF ALGORITHM
150314(DC)

List of Programs

1. WAP to implement the following using array as data structure and analyze its time Complexity.
   - a. Insertion sort
   - b. Selection sort
   - c. Bubble sort
   - d. Quick sort
   - e. Bucket sort
   - f. Radix sort
   - g. Heap sort
   - h. Merge sort

2. WAP to implement Linear and Binary Search and analyze its time complexity.
3. WAP to implement Matrix Chain Multiplication and analyze its time complexity.
4. WAP to implement Longest Common Subsequence Problem and analyze its time Complexity.
5. WAP to implement Optimal Binary Search Tree Problem and analyze its time complexity.
6. WAP to implement Huffman Coding and analyze its time complexity.
7. WAP to implement Dijkstra's Algorithm and analyze its time complexity.
8. WAP to implement Bellman Ford Algorithm and analyze its time complexity.
9. WAP to implement DFS and BFS and analyze their time complexities.
10. WAP to Implement 0/1 knapsack using dynamic programming.

COURSE OUTCOMES
After completion of this course, the students would be able to:

CO1. Relate the principles of algorithm design in solving problems.
CO2. Demonstrate basic algorithms and different problem solving strategies.
CO3. Build creativeness and confidence to solve non-conventional problems.
CO4. Analyze running times of algorithms using asymptotic analysis.
CO5. Compare various algorithm design approaches for solving real world problems.
CO6. Design and implement optimization algorithms in specific applications

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COMPUTER HARDWARE & TROUBLESHOOTING LAB
150315 (DLC)

COURSE OBJECTIVES:

- To understand the components on the motherboard.
- To perform system administration tasks.
- To be aware of different memories, I/O devices, installation and SMPS.
- To understand system related problems and methods of troubleshooting

Unit-I

Familiarize the computer system Layout: Marking positions of SMPS, Motherboard, FDD, HDD, SSD, CD, DVD and add on cards. Front panel indicators & switches and Front side & rear side Connectors.

Unit-II

Understanding of Motherboard and its interfacing component.

Unit-III

Install and configure computer drivers and system components. Disk formatting, Partitioning, Disk Image, Clone and Disk operating system commands, Disassembly and Reassembly of hardware. BIOS, Overclocking, Booting with USB/CD.

Unit-IV

Install, upgrade and configure Windows and Linux operating systems.

Unit -V

Remote desktop connections and file sharing. Identify, install and manage network connections -Configuring IP address and Domain name system. Installation of printer and scanner software. Using Disk Defragmenter, Check Disk and Disk Clean-up, Window restore point, Window Registry, Troubleshooting and Managing Systems.

RECOMMENDED BOOKS:

- Craig Zacker & John Rourke, "The Complete Reference:PC hardware", New Delhi, Tata McGraw-Hill
- Mike Meyers, "Introduction to PC Hardware and Troubleshooting", New Delhi, Tata McGraw-Hill

COURSE OUTCOMES:

After completion of this course, the students would be able to:

CO1. Outline the features and functions of motherboard, BIOS and Storage devices.
CO2. Assemble personal computer
CO3. Create partitioning of hard disk.
CO4. Install system and application software.
CO5. Configure network, Printer, Scanner and other devices.
CO6. Troubleshoot and Managing Systems

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COMPUTER HARDWARE & TROUBLESHOOTING LAB
150315 (DLC)

List of Experiments

1. Study the different parts of computer system.

2. Study different parts of motherboard

3. Study various types of connectors.

4. Draw the pin details of various connectors.

5. Study of CMOS setup and PC Troubleshooting.

6. Partition and format the hard disc

7. Installation of OS: Linux and windows

8. Connect systems in network using switch

9. Connect the systems in peer-to-peer network

10. Configure e-mail client and e-mail server

11. Configure browser for Internet access using proxy server

12. Configure Virtual Private Network (VPN)

13. Create Disk Image/Clone.

14. Overclocking, Booting with USB/CD.

15. Using Disk Defragmenter, Check Disk and Disk Clean-up, Window restore point and Window Registry.

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Syllabi of
Departmental Courses (DC) Courses
B.Tech IV Semester
(Computer Science and Engineering)
Under Flexible Curriculum

Department of Computer Science and Engineering

COMPUTER NETWORKS
150411 (DC)

COURSE OBJECTIVES

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.

Unit-I

Introduction: Computer Network, Types- LAN,MAN &WAN, Data transmission modes- Serial & Parallel, Simplex, Half duplex & full duplex, Synchronous & Asynchronous transmission, Transmission medium- Guided & Unguided, Cables- Twisted pair, Coaxial cable & Optical fiber, Networking devices-Repeaters, Hub, Switch, Bridge, Router, Gateway, Modem, Proxy Server, Wireless router, & Wireless Access Point (WAPs). Performance Criteria- Bandwidth, Throughput, Latency (Delay), Propagation Time, Transmission time & Queuing Time, Network Standardization- OSI Reference Model & TCP/IP Reference Mode.

Unit-II

Physical Layer: Network topologies- Bus, Ring, Star Topology & Mesh, Switching- Circuit switching, Message switching & Packet switching, Multiplexing; FDM – Frequency division multiplexing, WDM – Wavelength division multiplexing & TDM – Time division multiplexing, Wireless transmission- Electromagnetic spectrum, Radio transmission & Microwave transmission.

Unit-III

Data Link Layer: Introduction, Design issues, Services, Framing, Error control, Flow control, ARQ Strategies, Error Detection and correction, Parity bits, Cyclic Redundant Code (CRC), Hamming codes, MAC Sub Layer- The channel allocation problem, Pure ALOHA ,Slotted ALOHA, CSMA ,CSMA/CD,CSMA/CA, IEEE 802.3 frame format.

Unit-IV

Network Layer& Transport Layer: Introduction, Design issues, Services, Routing- Distance vector routing, Hierarchical routing & Link state routing, Shortest path algorithm- Dijkstra's Algorithm& Floyd–Warshall's Algorithm, Flooding, Congestion

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Control- Open Loop & Closed Loop Congestion Control, Leaky Bucket & Token bucket Algorithm. Connection Oriented & Connectionless Service, Port addressing basics.

Unit-V

Presentation, Session& Application Layer: Introduction, Design issues, Presentation layer- Translation, Encryption & Compression. Session Layer – Dialog Control, Synchronization. Application Layer- Remote login, File transfer & Electronic mail.

RECOMMENDED BOOKS

- Behrouz A. Forouzan "Data Communication and Networking", McGraw – Hill Publications.
- Andrew Tanenbaum – Computer Networks, PHI
- Peterson and Davie, "Computer Networks, A systems Approach", 5th ed., Elsevier, 2011.
- Ying-Dar Liu, Ren-Hwang, Fred Baker, "Computer Networks: An open Source Approach", McGraw – Hill, 2001.

COURSE OUTCOMES

After completion of the course students would be able to:

CO1. Outline the Data Communications System and its components.
CO2. Identify the different types of network topologies and protocols.
CO3. Enumerate the layers of the OSI model and function(s) of each layer.
CO4. Identify the different types of network devices and their functions within a network
CO5. Analyze the problems associated with various networking protocols and measure the Performance
CO6. Familiarity with the basic protocols of computer networks, and how they can be used to

assist in network design and implementation

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COMPUTER NETWORKS
150411 (DC)

List of Experiments

1) Study of different types of network cables and practically implement cross wired cable and straight through cable using clamping tool.
2) Install and configure Network Devices: HUB, Switch and Routers.
3) Configure Internet connection and use Ipconfig, tracert, ping, arp and Netstat utilities to debug the network issues.
4) Configure a Network topology using simulation software.
5) Simulation and analysis of Error and Flow Control protocols.
6) Simulation & Analysis of Routing Protocols.
7) Network Traffic flow analysis using Wireshark utility.
8) Installation and working of web proxy software's(CCproxy).
9) Data transfer between two systems using Socket programming
10) Simulate stop and wait protocol using Socket programming.

COURSE OUTCOMES
After completion of this course, the students would be able to:

CO1. Outline various techniques for encoding, decoding and digital data communication.

CO2. Analyze network topologies and Protocols.

CO3. Configure various networking devices and softwares.

CO4. Design and Simulate networking protocols.

CO5. Design Error Control and Flow Control techniques.

CO6. Troubleshot networking issues.

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DATABASE MANAGEMENT SYSTEM
150412 (DC)

COURSE OBJECTIVES
- To understand the fundamental concepts of a database management system.
- To analyses database requirements and determine the entities involved in the system and their relationship to one another.
- To develop the logical design of the database using data modelling concepts & normalization.
- To manipulate a database using SQL commands.

Unit-I
Introduction: DBMS Concepts & Architecture, File processing system, limitation of file processing system, Advantages of Database System, Schemas, Instances, Data Independence, Data dictionary, Functions of DBA, Database languages, Data Models: Hierarchical Data Model, Network Data Model & Relational Data Model, E-R Model, Comparison between Models, Introduction of File organization Techniques.

Unit-II
Relational Data Models: Entities & Attributes, Entity types, Key Attributes, Relationships, Domains, Tuples, types of Attributes, Relations, Characteristics of Relations, Keys, Attributes of Relation, Relational Database, Integrity Constraints.
Relational Algebra: Concept and Relational Algebra operations like Select, Project, Join, Division, Union etc.

Unit-III
SQL: Introduction of SQL, features of SQL, Data Definition & Data Manipulation commands in SQL, SQL operators, Update Statements & Views in SQL, Query & Sub query, Data Retrieval Queries & Data Manipulation Statements examples etc. Overview of Tuple Oriented Calculus & Domain Oriented Relational Calculus.

Unit-IV
Normalization: Introduction to Normalization, concepts of anomalies and its types, closure set of dependencies and of attributes, Various Normal Forms: 1NF, 2NF, 3NF, BCNF, Functional Dependency, Decomposition, Dependency Preservation, Loss Less & Lossy Join, Definition of Dangling Tuple, and Multi-values Dependencies.

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Unit-V

Transaction Processing & Concurrency Control: Transaction Processing Concepts, ACID properties, State Diagram, Types of Transaction, Basic idea of serializability, Concurrency Control, Concurrent operation of Databases, Recovery, Types of Recovery. Basic overview of Distributed Databases System and Relational Database Management System, Concepts of Object-Oriented Database System and its tools.

RECOMMENDED BOOKS

- Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGraw-Hill, 6th Edition.
- Raghu Ramakrishnan, Johannes Gehrke,"Database Management System", McGraw Hill., 3rd Edition.
- Elmasri & Navathe, "Fundamentals of Database System", Addison-Wesley Publishing, 5th Edition.
- Date C.J, "An Introduction to Database", Addison-Wesley Pub Co, 8th Edition.
- B.C. Desai, "An introduction to Database systems"

COURSE OUTCOMES
After completion of the course students would be able to:

CO1. Define the terminology, features, classifications, and characteristics embodied in database systems.

CO2. Identify different issues involved in the design and implementation of database system.

CO3. Analyse database schema for a given problem domain.

CO4. Justify principles for logical design of databases, including the E R modelling and Normalization approach.

CO5. Apply transaction processing concepts and recovery methods over real time data.

CO6. Formulate, using relational algebra and SQL, solutions to a broad range of query
_ Problems,

Department of Computer Science and Engineering

DATABASE MANAGEMENT SYSTEM
150412 (DC)
List of Experiments

1. Implementation of DDL commands of SQL with suitable examples
   1. Create table
   2. Alter table
   3. Drop table
2. Implementation of DML commands of SQL with suitable examples
   1. Insert
   2. Update
   3. Delete
3. Implementation of different types of function with suitable examples
   1. Number function
   2. Aggregate function
   3. Character function
   4. Conversion function
   5. Date function
4. Implementation of different types of operators in SQL
   1. Arithmetic operators
   2. Logical operators
   3. Comparison operators
   4. Set operation
5. Implementation of different types of joins
   1. Inner join
   2. Outer join
   3. Natural join
6. Study and implementation of
   1. Group by and having clause
   2. Order by clause
   3. Indexing
7. Study and implementation of
   1. Sub queries
   2. Views
8. Study and implementation of different types of constraints.
9. Study and implementation of Database Backup and Recovery commands.   Study and implementation of Rollback, Commit, Savepoint.

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SOFTWARE ENGINEERING
150413 (DC)

COURSE OBJECTIVES

- To understand the nature of software development and software life cycle process models, agile software development, SCRUM and other agile practices.
- To understand project management and risk management associated with various types of projects.
- To know basics of testing and understanding concept of software quality assurance and software configuration management process.

Unit-I

Introduction to Software Engineering: Definition, software engineering-layered Technology, Software Characteristics and Components, Software model: Software Development of Life Cycle Model (SDLC), The Waterfall Model, Iterative Waterfall Model, Prototyping Model, Spiral Model, RAD Model. Selection criteria of model: Characteristics of Requirements, Status of Development Team, Users participation, Type of Project and Associated Risk.

Unit - II

Requirement Engineering: Definition, Requirement Engineering Activity , Types of Requirement- Functional and Non-functional Requirements, User and System Requirements, Requirement Elicitation Methods, Requirement Analysis Methods, Requirement Documentation (SRS), Requirement Validation, Requirement Management.

Unit – III

Design Concept, Principle and Methods: Design Fundamentals, Design Principles, Effective Modular Design, Design Representations, Architectural design, Procedural design, data Directed design, Real Time Design, Object Oriented Design, Coupling and Cohesion.

Unit - IV

Software Metrics, Project Management and Estimation: Metrics in Process and Project domains, Software Measurement, Software Quality Metrics, Project Management- Basics-People, Product, Process, Project, Estimation- Software Project

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Estimation, Decomposition Techniques- Function Point Estimation, Line of Code (LOC) based estimation, Empirical Estimation, COCOMO Model, Project Scheduling Techniques.

Unit – V

Software Testing: Definitions, Software Testing Life Cycle (STLC), , Test Case Design, Strategic Approach to Software Testing- Verification & Validation , Strategic issues, Criteria for completion of Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Black Box Testing Techniques, White Box Testing Techniques, Acceptance Testing.

RECOMMENDED BOOKS

- Software Engineering, Sommerville, Pearson.
- Software Engineering: A Practitioner's Approach, Roger S. Pressman, McGraw Hill.
- Software Engineering, K.K. Agrawal & Yogesh Singh, New Age Publication.
- Software Engineering, Rajib Mall, PHI.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. Explain the various fundamental concepts of software engineering.
CO2. Develop the concepts related to software design & analysis.
CO3. Compare the techniques for software project management & estimation.
CO4. Choose the appropriate model for real life software project.
CO5. Design the software using modern tools and technologies.
CO6. Test the software through different approaches.

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Department of Computer Science and Engineering

THEORY OF COMPUTATION
150414 (DC)

COURSE OBJECTIVE

- To understand computability, decidability, and complexity through problem solving.
- To analyse and design abstract model of computation & formal languages
- To understand and conduct mathematical proofs for computation and algorithms.

Unit-I
Introduction to Theory of Computation: Automata, Computability and Complexity, Alphabet, Symbol, String, and Formal Languages, Examples of automata machines, Finite Automata as a language acceptor and translator, Moore machines and Mealy machines, Composite Machine, Conversion from Mealy to Moore and vice versa.

Unit-II
Types of Finite Automata: Non Deterministic Finite Automata (NDFA), Deterministic finite automata machines, conversion of NDFA to DFA, minimization of automata machines, regular expression, Arden's theorem. Pumping lemma, applications, Closure properties of regular languages, 2 way DFA.

Unit-III
Grammars: Types of grammar, context sensitive grammar, and context free grammar, regular grammar. Derivation trees, Rightmost and Leftmost derivations of Strings, ambiguity in grammar, simplification of context free grammar, killing null and unit productions, conversion of grammar to automata machine and vice versa, Chomsky hierarchy of grammar,. Chomsky Normal Form (CNF) and Greibach Normal Form (GNF).

Unit-IV
Push down Automata: Definition, Model, Acceptance of CFL, Acceptance by Final State and Acceptance by Empty stack, Example of PDA, deterministic and non-deterministic PDA, conversion of PDA into context free grammar and vice versa, CFG equivalent to PDA.

Unit-V
Turing Machine: Techniques for construction. Universal Turing machine Multitape, multihead and multidimensional Turing machine, N-P complete problems. Decidability and Recursively Enumerable Languages, decidability, decidable languages, undecidable languages, Halting problem of Turing machine & the post correspondence problem (PCB).

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RECOMMENDED BOOKS

- Introduction to Automata Theory Language & Computation, Hopcroft & Ullman, Narosa Publication.
- Element of the Theory Computation, Lewis & Christors, Pearson.
- Theory of Computation, Chandrasekhar & Mishra, PHI.
- Theory of Computation, Wood, Harper & Row.
- Introduction to Computing Theory, Daniel I-A Cohen, Wiley.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. Explain the basic concepts of switching and finite automata theory & languages.

CO2. Relate practical problems to languages, automata, computability and complexity.

CO3. Construct abstract models of computing and check their power to recognize the languages.

CO4. Analyse the grammar, its types, simplification and normal form.

CO5. Interpret rigorously formal mathematical methods to prove properties of languages, grammars and automata.

CO6. Develop an overview of how automata theory, languages and computation are applicable in engineering application.

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Department of Computer Science and Engineering

PROGRAMMING LAB.
150415(DLC)
Python Programming

COURSE OBJECTIVES
- To understand components of Python Program
- To learn the basic construct of python programming for solving real world research-based problems.
- To visualize and analyze data using python libraries

Unit -I

Setting up programming environment, running python programs from a terminal, variables and simple data types: variables, strings, numbers and maths, comments, conditional statements.

Unit -II

Introducing loops, working of input function, various operations on Tuples, lists, Set and Dictionary, Loops, Conditional Statement,

Unit -III
Built in function, defining a function, passing arguments, return value, lambda function, exception handling

Unit -IV
Object oriented programming, Creating and using class and object, methods, inheritance, debugging.

Unit V
Working with packages, pandas, NumPy, Matplotlib and scikit-learn

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RECOMMENDED BOOKS

- Java: The Complete Reference Hebert Schildt, Mc Graw Hill.
- Object-Oriented Programming with C++ and Java Debasis Samanta, Prentice Hall India.

COURSE OUTCOMES

After successful completion of course, the student will be able to:

CO1. Tell the use of various built-in data structures used in python.

CO2. Outline the working of file handling operations, normal functions and lambda functions in python.

CO3. Apply the concepts of object oriented programming in python.

CO4. Analyze the data and visualize it using python's matplotlib.

CO5. Rule out various important characteristics of data using scikit-learn package.

CO6. Create efficient algorithms in python to solve real world problems.

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Department of Computer Science and Engineering

PROGRAMMING LAB.
150415(DLC)
Python Programming

List of Experiments

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1. Python program to take input from user and display "Hello MITS Gwalior".
2. Python program to do arithmetic operations.
3. Python program to find area of rectangle, circle and triangle.
4. Python program to check number is even or odd, prime not prime.
5. Python program find factorial of a number.
6. Python program to check year is leap year or not.
7. Python Program to implement the operation on List, Tuple, Set and Dictionary.
8. Python Program to handle the exception and file handling operation.
9. Python Program to create and use of user defined function.
10. Python Program to solve a problem using Lambda function
11. Python Program for creating an object with and without inheritance.

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Department of CSE

DISCRETE STRUCTURES
150416

COURSE OBJECTIVES:
- To perceive the knowledge of basic algebra
- To use logical notation to define fundamental mathematical concepts
- To familiarize predicate & propositional logic
- To know about the graph theory and its application in computer engineering
- To familiarize the discrete numeric function and generating function.

Unit 1:
Finite and infinite sets, mathematical induction, Principles of inclusion and exclusion, functions and relations, summations, binary relations, equivalence relations, Congruence Relation and partitions, partial ordering relations and lattices, Pigeonhole principle.

Unit 2:
Propositional logic, syntax, semantics of Atf (atomic formula), Wff'(well formed formula's),validity and satisfiability of wff' by Quine's method, Normal and closure form of prepositional calculus.

Unit 3:
Basic of Graph Theory as a Discrete Structure, planner graphs, Graph Coloring, multi-graphs and weighted graph, shortest path in weighted graph, Introduction to Eularian paths and circuits, Hamiltonian paths and circuits, Introduction to trees, rooted trees, Path length in rooted trees, spanning trees and cut trees.

Unit 4:
Introduction to discrete numeric functions and generating functions, Introduction to recurrence relations, linear recurrence relations with constant coefficients, homogeneous solutions, particular solutions and total solutions.

Unit 5:
Introduction to group, subgroups, generations and evaluation of power, cosets and Lagrange's theorem, group codes, isomorphism and automorphism, homomorphism and normal sub groups, ring, integral domain and field.

COURSE OUTCOMES:
After completing this course, the students will be able to:
CO1. Understand logical notation to define and reason mathematically about the fundamental data types and structures used in computer algorithms and systems.
CO2. Outline various mathematical concepts along with their applications.
CO3. Implement the applications of various types of graphs to solve real life problem.
CO4. Apply the mathematical concepts to solve engineering problems.
CO5. Analyze the set theory, prepositional logic, graph theory, discrete numeric function and algebraic structure to examine the real world problem.
CO6. Design analytical skill and interpret applications of engineering in real time troubleshooting.

RECOMMENDED BOOKS:
- J. Tremblay and R. Manohar: Discrete Mathematical Structures with Application to Computer science.
- Narsingh Deo: Graph Theory.
- C.L.Liu: Discrete Mathematics.

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Department of CSE

DISCRETE STRUCTURES
150416

- K.H. Rosen: Discrete Mathematics and its Applications
- S. Lipschutz, Discrete Mathematics

Department of Computer Science and Engineering

SOFTWARE ENGINEERING LAB
150502 (DC-9)

COURSE OBJECTIVES

- To explain methods of capturing, specifying, visualizing and analyzing software requirements.

- To understand concepts and principles of software design and user-centric approach and principles of effective user interfaces.

- To know the basics of testing and understand the concept of software quality assurance.

LIST OF EXPERIMENTS

Experiment 1: Identify the requirements from problem statements
Requirements | Characteristics of Requirements | Categorization of Requirements | Functional Requirements | Identifying Functional Requirements

Experiment 2: Estimation of project metrics using estimation techniques like COCOMO model
Project Estimation Techniques | COCOMO | Basic COCOMO Model | Intermediate COCOMO Model | Complete COCOMO Model | Advantages of COCOMO | Drawbacks of COCOMO | Halstead's Complexity Metrics

Experiment 3: Modeling UML Use Case diagrams and capturing Use Case Scenarios
Use case diagrams | Actor | Use Case | Subject | Graphical Representation | Association between Actors and Use Cases | Use Case Relationships | Include Relationship | Extend Relationship | Generalization Relationship | Identifying Actors | Identifying Use cases | Guidelines for drawing Use Case diagrams

Experiment 4: E-R modeling from the problem statements
Entity Relationship Model | Entity Set and Relationship Set | Attributes of Entity | Keys | Weak Entity | Entity Generalization and Specialization | Mapping Cardinalities | ER Diagram | Graphical Notations for ER Diagram | Importance of ER modeling

Experiment 5: Modeling UML Class diagrams and Sequence diagrams
Structural and Behavioral aspects | Class diagram | Elements in class diagram | Class | Relationships | Sequence diagram | Elements in sequence diagram | Object | Life-line bar | Messages

Experiment 6: Modeling Data Flow diagrams
Data Flow Diagram | Graphical notations for Data Flow Diagram | Explanation of Symbols used in DFD | Context diagram and leveling DFD

Experiment 7: Create flow chart for an algorithm using Raptor
Assignment, Call, Input, Output, Selection and Loop symbols

Experiment 8: Estimation of Test coverage metrics and structural complexity
Control Flow Graph | Terminologies | McCabe's Cyclomatic Complexity | Computing Cyclomatic Complexity | Optimum Value of Cyclomatic Complexity | Merits | Demerits

Experiment 9: Designing Test Suites
Software Testing | Standards for Software Test Documentation | Testing Frameworks | Need for Software Testing | Test Cases and Test Suite | Types of Software Testing | Unit Testing | Integration Testing | System Testing | Example | Some Remarks

Experiment 10: Do requirement analysis and develop Software Specification Sheet (SRS) for suggested system.

Experiment 11: To prepare time line chart/Gantt chart/PERT chart for selected software project.

Experiment 12: To perform the implementation view diagram: Component diagram for the system.

RECOMMENDED TOOLS

- Selenium
- Star UML
- UMLet
- Raptor

REFERENCE

- Virtual Labs (http://vlabs.iitkgp.ernet.in/se/)

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1: demonstrate the basic concept of UML.

CO2: discuss the software development process using different tools.

CO3: display the various ways for solving different common modelling problems using UML.

CO4: use the knowledge of Software engineering and project management.

CO5: identify the vocabulary, rules and idioms of the UML and learn how to model it effectively.

CO6: design the software systems using software engineering concepts.

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Department of Computer Science and Engineering

THEORY OF COMPUTATION LAB
150503 (DC-10)

LIST OF EXPERIMENTS

1. Design a Program for creating machine that accepts three consecutive one.

2. Design a Program for creating machine that accepts the string always ending with 101.

3. Design a Program for Mode 3 Machine

4. Design a program for accepting decimal number divisible by 2.

5. Design a program for creating a machine which accepts string having equal no. of 1's and 0's.

6. Design a program for creating a machine which count number of 1's and 0's in a given string.

7. Design a Program to find 2's complement of a given binary number.

8. Design a Program which will increment the given binary number by 1.

9. Design a Program to convert NDFA to DFA.

10. Design a Program to create PDA machine that accept the well-formed parenthesis.

11. Design a PDA to accept WCW^R where w is any string and W^R is reverse of that string and C is a Special symbol.

12. Design a Turing machine that's accepts the following language $a^n b^n c^n$ where n>0.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1: demonstrate various computational models.

CO2: construct abstract models of computing.

CO3: justify the power of abstract models in computing to recognize the languages.

CO4: Apply analytical thinking and intuition for problem solving in the related areas.

CO5: identify the limitations of computation in problem solving.

CO6: develop set of rules for syntax verification.

Department of Computer Science and Engineering

MICROPROCESSOR & INTERFACEING LAB
150504 (DC-11)

LIST OF EXPERIMENTS

1. Write an assembly language program to perform the addition of two 8-bit number using 8085/8086 instruction set.
2. Write an assembly language program to find the sum of numbers in array of data using 8085/8086 instruction set.
3. Write an assembly language program to perform the subtraction of two 8-bit number using 8085/8086 instruction set.
4. Write an assembly language program to move data block starting at location 'X' to location 'Y' without overlap using 8085/8086 instruction set.
5. Write an assembly language program to arrange set of 8-bit numbers starting at location in ASCENDING/DESCENDING order. Display the stored vector in address data field using 8085/8086 instruction set.
6. Write an assembly language program to perform the multiplication of two 8-bit numbers using 8085/8086 instruction set.
7. Write an assembly language program to find the larger number in array of data using 8085/8086 instruction set.
8. Write an assembly language program to perform the division of two 8-bit numbers using 8085/8086 instruction set.
9. Write an assembly language program to convert two BCD numbers in memory of the equivalent HEX number using 8085/8086 instruction set.
10. Write an assembly language program to convert given hexadecimal number into its equivalent BCD number using 8085/8086 instruction set.
11. Write an assembly language program to convert given hexadecimal number into its equivalent ASCII number using 8085/8086 instruction set.
12. Write an assembly language program to convert given ASCII character into its equivalent hexadecimal number using 8085/8086 instruction set.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1: differentiate the various types of instructions and addressing modes.
CO2: identify the Hex code/ Machine code of instructions in assembly language.
CO3: perform interfacing of various peripheral devices and memory with microprocessor.
CO4: demonstrate the arithmetic & Logical operation using instruction set of 8086/8051 microprocessor.
CO5: use of 8086/8051 for interfacing with I/O devices.
CO6: build the assembly language programs in 8086/8051 to solve real world problems.

Skill based mini-project of
Laboratory Courses
B.Tech III
Semester
(Computer Science and Engineering)
Under Flexible Curriculum
[Item-9]

Department of Computer Science and Engineering

COMPUTER GRAPHICS
150313(DC)

Skill Based Projects

1. Develop a project to implement a stretch band effect. In which a user will click on the screen and drag the mouse / arrow keys over the screen coordinates. The line should be updated like rubber-band and on the right-click gets fixed.

2. Develop a project to implement the DDA algorithm for drawing line. In this project a programmer is expected to shift the origin to the center of the screen and divide the screen into required quadrants.

3. Develop a project with menu option to input the line coordinates from the user to generate a line using Symmetrical DDA algorithm, Brenham's algorithm and DDA algorithm on a single screen with different colors.

4. Develop a project to demonstrate 2D animation such as clock simulation, vehicle movement etc.

5. Develop a project to demonstrate 2D animation such as rising sun, sunset, blinking stars.

6. Develop a project to implement the bouncing ball inside a defined rectangular window.

7. Develop a project to draw Bezier and B-Spline Curves with interactive user inputs for control polygon defining the shape of the curve.

8. Develop a project to demonstrate shear transformation in different directions on a unit square situated at the origin.

9. Develop a project in which a set of lines and a rectangular area of interest is given by user, the task is to remove lines which are outside the area of interest and clip the lines which are partially inside the area.

10. Develop a small graphics editor with line, circle, parabola, hyperbola generation.

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Department of Computer Science and Engineering

DESIGN AND ANALYSIS OF ALGORITHM
150314(DC)

Skill Based Projects

1. Develop a project to show graphical implementation of any two sorting methods.
2. Develop a GUI project for implementation of Sorting and searching methods.
3. Implement Kruskal and Prim's algorithm for solving minimum spanning tree problem on Different graphs, and on the basis of complexity analysis deduce which among them is the best suited algorithm.
4. Implement Greedy algorithm and Backtracking algorithm to find a solution for the graph coloring problem on various graphs, and on the basis of complexity analysis deduce which among them is the best suited algorithm.
5. Solve Travelling Salesman Problem using Greedy Algorithm and Brute Force Algorithms, and on the basis of complexity analysis deduce which among them is the best suited algorithm.
6. Using complexity analysis, deduce among brute force and greedy algorithm, which is better for solving 0/1 Knapsack problem.
7. Implement Merge sort, Insertion sort and Quick sort for the following cases:
    a)   Unsorted list of numbers (with size of list > 100)
    b)   Sorted list of numbers (with size of list > 100)
    c)   Unsorted list of numbers (with size of list <= 20)
    d)   Sorted list of numbers (with size of list <= 20)
    Then on the basis of complexity analysis, deduce which among them is best suited for each case.
8. Compare the Exhaustive Search Algorithm and Greedy Algorithm for solving Job Scheduling Problem.
9. Implement different shortest path algorithms on various graphs and compare the performance with each other in order to conclude the best among them.

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Department of Computer Science and Engineering

COMPUTER HARDWARE & TROUBLESHOOTING LAB
150315 (DLC)

Skill Based Project

1. Disassemble and assemble various components of the computer System.
2. Install and Configure Windows/Linux Operating System.
3. Boot System using USB/CD.
4. Install and Configure Drivers and System software such as Printer drivers, Scanner Drivers,Sound and display drivers etc
5. Install multiple operating system on a system.
6. Create the clone of the hard disk.
7. Connect few systems using network and IP address setting to configure network.
8. To connect a multiple hard disk drive in a computer and then create a multiple volume.
9. Troubleshoot system using Disk Defragmenter, Check Disk and Disk Clean-up, Window restore point.
10. Study the details of editing the registry. Try the commands and observe its use.
11. Install Apache Web server, MongoDB and other software's.

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Department of Computer Science and Engineering

COMPUTER NETWORKS
150411 (DC)

Skill-Based Projects

1) Create a patch cord to connect network. Develop a small network to connect 3 systems.

2) Develop an application to simulate PING and TRACEROUTE commands.

3) Simulate Sliding window protocol using socket programming.

4) Simulate Stop and Wait protocol using socket programming.

5) Create chat application using socket Programming.

6) Develop a utility for cyclic redundancy check.

7) Develop a project for Hamming codes.

8) Develop application to produce even/odd parity for given input.

9) Develop a GUI application to find out shortest path using Dijkstra's Algorithm .

10) Develop application to find out shortest path using Floyd–Warshall Algorithm.

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Department of Computer Science and Engineering

DATABASE MANAGEMENT SYSTEM
150412 (DC)

Skill-Based Projects

1. Develop a project for Library book management database.
2. Develop a project for Hostel seat booking system database
3. Develop a project for Learning management system
4. Develop a project for Restaurant management system database
5. Develop a project for Employee referral system database
6. Develop a project for I-card generation system database
7. Develop a project for Certificate Management System Database
8. Develop a project for Electric Bill System Database
9. Develop a project for Course management system database
10. Develop a project for Client Management System Database
11. Develop a project for Hotel Management System Database

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Department of Computer Science and Engineering

PROGRAMMING LAB.
150415(DLC)
Python Programming

Skill Based Project

1. Develop Tic-Tac-Toe Game.
2. Develop Countdown Clock and Timer application.
3. Develop a Scientific digital calculator.
4. Develop music player.
5. Develop an application for Random password generator.
6. Develop an application for Sending emails.
7. Develop Keylogger application.
8. Develop Web Crawler application.
9. Visualize the Publicly available real world data set using various function and identify the suitable plot for better representation.
10. Handle the missing data and categorical value in a real world Data Set.
11. Build a prediction model based on Classification Data Set.
12. Build a prediction model based on Regression Data Set.
13. Build a prediction model based on Clustering Data Set.

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Department of Computer Science and Engineering

Basic Computer Engineering
100023

List of Skill Based Mini-projects for Basic Computer Engineering

1. Develop a project in C/C++ to implement Tic tac toe game
2. Develop a project in C/C++ to implement basic operation of Leave Management System
3. Develop a project for report card system using C/C++.
4. Develop a project in C/C++ which can generate a Calendar for any year.
5. Develop a project in C/C++ which demonstrates the operations performed by an ATM Machine.
6. Develop a project in C/C++ to create a Number System Conversion system.
7. Develop a project in C/C++ to implement basic operation of Department Store Management System
8. Develop a project in C/C++ to implement basic operation of Library Management System
9. Develop a project in C/C++ to implement basic operation of Bus Reservation System
10. Develop a project in C/C++ to implement Periodic Table.
11. Develop a project in C/C++ to implement Digital clock

Please Note: Each project has to be submitted by a group of 2 to 4 students (Depending upon project), and each group will be assigned only one project.

Madhav Institute of Technology and Science, Gwalior
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Department of Computer Science & Engineering

B. Tech. Computer Science & Engineering
CO Attainment, Gap Analysis and Action Taken (Session: July-Dec. 2020 Semester)

	Course Name		Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Target	Gap	Action Taken
Semester3	150301: Digital Electronics	CO1	Explain the computer architecture for defining basic component and functional unit	65.33	75	67.264	65	-	No action needed
		CO2	Recall different number system and solve the basic arithmetic operations	75.33	84.7	75.604	65	-	
		CO3	Develop the understanding of combinational circuits	76	77.7	76.34	65	-	
		CO4	Analyze the basic concepts of sequential circuits	72	79.16	73.432	65	-	
		CO5	Compare various memories	66.67	75	68.336	65	-	
		CO6	Solve the Boolean functions using logic gates	66.67	84.7	70.276	65	-	
	150302: Data Structures	CO1	Outline the basics of algorithms and their performance criteria	64	76.81	66.56	65	-	Detailed analysis of conducted Quizzes and assignments
		CO2	Explain the working of linear and non-linear data structures	64	69.57	65.11	65	-	
		CO3	Identify the appropriate data structure to solve the specific problems	66.67	65.22	66.38	65	-	
		CO4	Analyse the performance of various data structures and their applications	65.33	68.12	65.89	65	-	
		CO5	Evaluate the time and space complexities of various data structures and their applications	64	62.32	63.66	65	1.336	
		CO6	Design the optimal algorithmic solutions for various problems	66.67	62.32	65.80	65	-	
	150304: OOPs and methodology	CO1	Tell the concepts of classes & objects and their significance in real world	92.8	77.78	89.796	70	-	No action needed
		CO2	Explain the benefits of object oriented design	92.8	76.39	89.518	70	-	
		CO3	Build C++ classes using appropriate encapsulation and design principles	88.8	75	86.04	70	-	
		CO4	Analyze the utilization of inheritance and polymorphism in the solution of problems	86.4	76.39	84.398	70	-	
		CO5	Choose appropriate object orient programming concepts for solving real world problems	93.6	76.39	90.158	70	-	
		CO6	Develop solutions to problems demonstrating usage of control structures, modularity, I/O and other standard language constructs	84.8	77.78	83.396	70	-	

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B. Tech. Computer Science & Engineering
CO Attainment, Gap Analysis and Action Taken (Session: July-Dec. 2020 Semester)

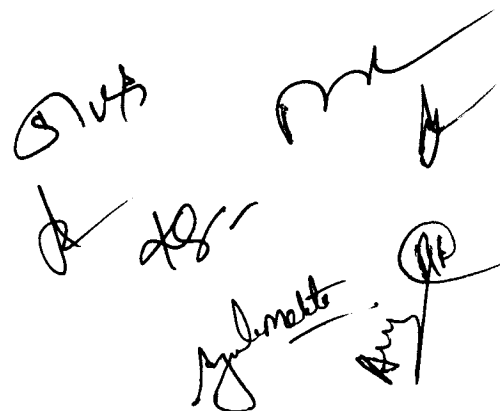| Course Name		Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Target	Gap	Action Taken
150303: Computer Graphics and Multimedia	CO1	Illustrate the fundamental concepts of Computer Graphics, hardware & software components and its applications.	54	72	57.6	60	2.4	Conducted Remedial classes and tutorial classes and Extra practice sessions
	CO2	Explain various graphical image genration & manipulation methods and algorithms.	65	68	65.6	60	-	
	CO3	Apply various methods of generation & manipulation of images for creating graphical images and color models.	61	69	62.6	60	-	
	CO4	Explain various rendering, illumination and color models of realistic image or pictures using image processing techniques	66.4	71	67.32	60	-	
	CO5	Discuss various methods to create natural seen & realistic images in 2D &3D space.	56	62	57.2	60	2.8	
	CO6	Design & analysis of various graphical image processing techniques and animation.	57	61	57.8	60	2.2	
150305: Hardware LAB	CO1	Explain basics of different computer peripherals and interfaces.	52	64	54.4	55	0.6	No action needed
	CO2	Demonstrate architecture of various computer hardware devices and their functioning.	92	75	88.6	60	-	
	CO3	Demonstrate the details of system buses, memory system, and I/O interfaces.	100	71	94.2	60	-	
	CO4	Identify the existing configuration of the computers peripherals and creating wireless network through the access point	92	81	89.8	60	-	
	CO5	Analyze progress in contemporary peripherals and bus systems	100	85	97	60	-	
	CO6	construct a networking based on IPv4 address scheme	68	61	66.6	60	-	
150503: Theory of Computation	CO1	explain the basic concepts of switching and finite automata theory & languages.	95.2	83.3	92.82	60	-	No action needed
	CO2	Relate practical problems to languages, automata, computability, and complexity	85.6	85.4	85.56	65	-	
	CO3	Construct abstract models of computing and analyse their power to recognize the languages.	68.8	87.5	72.54	60	-	
	CO4	analyse the grammar, its types, simplification and normal form	89.6	82.2	88.12	60	-	
	CO5	interpret rigorously formal mathematical methods to prove properties of languages, grammars and automata	67.2	80.2	69.8	60	-	
	CO6	develop an overview of how automata theory, languages and computation are applicable in engineering application	76.8	77	76.84	75	-	

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B. Tech. Computer Science & Engineering
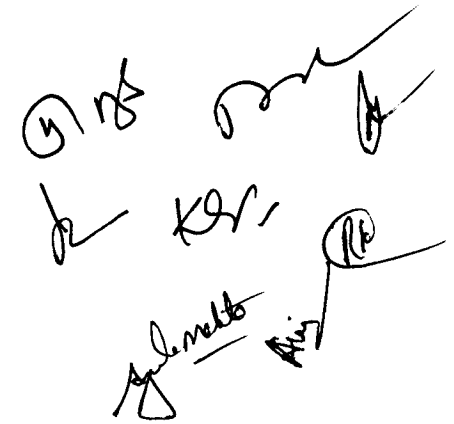## CO Attainment, Gap Analysis and Action Taken (Session: July-Dec. 2020 Semester)

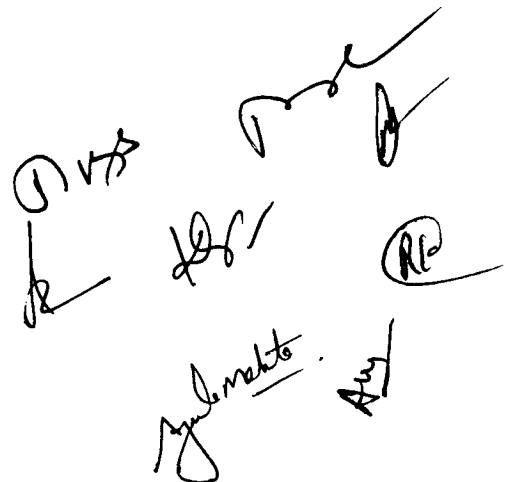|	Course Name		Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Target	Gap	Action Taken
Semester5	150502: Software Engineering	CO1	explain the various fundamental concepts of software engineering.	92.8	88	92.8	75	-	No action needed
		CO2	develop the concepts related to software design & analysis.	97.6	81	97.6	80	-	
		CO3	compare the techniques for software project management & estimation	99.2	72	99.2	85	-	
		CO4	choose the appropriate model for real life software project	93.6	84	93.6	80	-	
		CO5	design the software using modern tools and technologies	94.4	76	94.4	80	-	
		CO6	test the software through different approaches	93.6	91	93.6	75	-	
	150504: Microprocessor & Interfacing	CO1	Classify the concepts of different advanced microprocessors and microcontroller	84	66.00	80.4	65	-	No action needed
		CO2	Illustrate the various peripheral interfaces, controllers and bus standards	72	81.00	73.8	65	-	
		CO3	Build a system using peripheral devices and controllers for 8086 microprocessor	71	82.00	73.2	65	-	
		CO4	Distinguish the interface with various devices to the microprocessor	68	69.00	68.2	65	-	
		CO5	Design an interface for various devices on 8086/8051 based systems	78	72.00	76.8	65	-	
		CO6	Develops skills in assembly language programming for 8051 & 8086 applications	69	75.00	70.2	65	-	
	150501: Discrete Structures	CO1	understand the basic concepts of set theory, propositional logic, graph theory, discrete numeric function and algebraic structure	56	76.81	60.16	55	-	No action needed
		CO2	Illustrate the knowledge of course content and distinguish between them in terms of their applications	68	71.01	68.60	65	-	
		CO3	Implement the course content to solve the problems.	65	73.91	66.78	60	-	
		CO4	Apply the concept of studied topics with suitable technique faced in engineering problems	58.4	71.01	60.92	60	-	
		CO5	Analyze the basic concepts of set theory, propositional logic, graph theory, discrete numeric function and algebraic structure to examine the real world problems	80	76.81	79.36	65	-	
		CO6	Design the analytical skill and interpret applications of engineering beneficial in real time troubleshooting	61.6	68.12	62.90	60		

Madhav Institute of Technology and Science, Gwalior

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Computer Science & Engineering

B. Tech. Computer Science & Engineering
CO Attainment, Gap Analysis and Action Taken (Session: July-Dec. 2020 Semester)

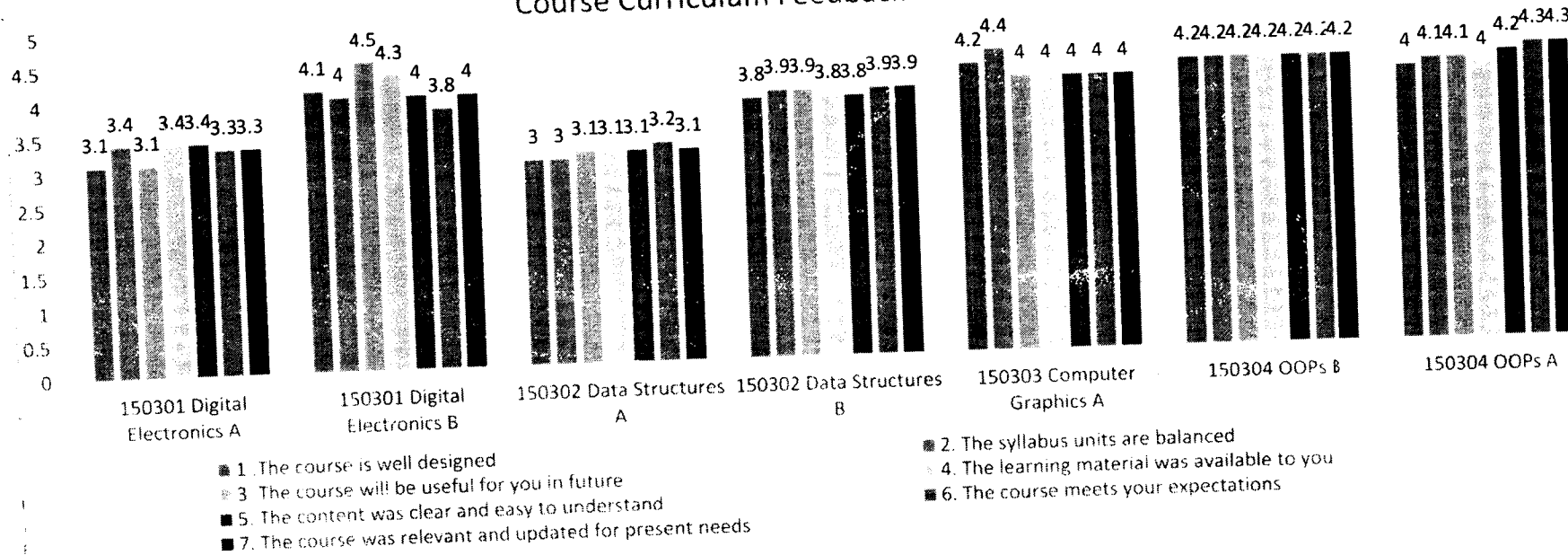| Course Name			Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Target	Gap	Action Taken
150505: Minor project		CO1	Able to formulate a real problem	92	81	89.8	70	-	
		CO2	Express the technical ideas, strategies and methodologies	76	68	74.4	70	-	
		CO3	Utilize the new tools, algorithms, techniques to obtain solution of the project	64	75	66.2	65	-	No action needed
		CO4	Test and validate the develop the prototype/results	76	71	75	70·	-	
		CO5	Write a project report	68	69	68.2	65	-	
		CO6	Present the oral demonstration	92	73	88.2	70	-	
150711: Networking with TCP/IP		CO1	define the concept of computer network and various layered architecture	75	87	77.4	65	-	
		CO2	compare the classless and class full addressing of IPV4	81	85	81.8	65	-	
		CO3	identify the different types of networking devices and their functions within a network	71	74	71.6	65	-	
		CO4	analyze various protocols of computer networks for assisting network design and implementation.	76	81	77	65	-	No action needed
		CO5	design client server applications and communication model and protocols for communication.	69	89	73	65	-	
		CO6	elaborate various TCP/IP protocol for achieving multimedia and security services.	71	80	72.8	65	-	
150713: Distributed Systems		CO1	tell the basic elements and concepts related to distributed system technologies	75.2	81	76.36	60	-	
		CO2	demonstrate knowledge of the core architectural aspects of distributed systems.	85.6	84	85.28	65	-	
		CO3	identify how the resources in a distributed system are managed by algorithm	76	79	76.6	60	-	No action needed
		CO4	examine the concept of distributed file system and distributed shared memory	88	82	86.8	60	-	
		CO5	compare various distributed system algorithms for solving real world problems	85.6	76	83.68	60	-	
		CO6	develop application for achieving various services of distributed system	85.6	72	82.88	75	-	

B. Tech. Computer Science & Engineering
CO Attainment, Gap Analysis and Action Taken (Session: July-Dec. 2020 Semester)

Course Name		Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Target	Gap	Action Taken
150712: Data Mining and Warehousing	CO1	Illustrate various tools of Data Mining and their techniques to solve the real time problems	61.6	85	66.28	60	-	No action needed
	CO2	Apply data preprocessing and data quality for construction of data warehouse	60	85	65	60	-	
	CO3	Identify various data bases and modeling of data warehouse and comparing various methods for storing & retrieving data from different data sources/repository.	64.8	85	68.84	60	-	
	CO4	Develop various classification algorithms for data using data mining.	60	82	64.4	60	-	
	CO5	Make use of data mining methods for identification of association for transactional databases.	60.8	87	66.04	60	-	
	CO6	Analyse data mining for knowledge discovery & prediction	60	90	66	60	-	
Internet of Things LAB	CO1	understand the key components that make up an IoT system	68	75	69.4	65	-	No action needed
	CO2	explain the definition and usage of the term "Internet of Things" in different contexts	72	71	71.8	65	-	
	CO3	differentiate between the levels of the IoT stack and be familiar with the key technologies and protocols employed at each layer of the stack	80	84	80.8	65	-	
	CO4	apply the knowledge and skills acquired during the course to build and test a complete, working IoT system involving prototyping, programming and data analysis	80	68	77.6	65	-	
	CO5	understand where the IoT concept fits within the broader ICT industry and possible future trends	80	71	78.2	65	-	
	CO6	appreciate the role of big data, cloud computing and data analytics in a typical IoT system	68	65	67.4	65	-	
100008: Intellectual Property Rights	CO1	Imbibe the knowledge of Intellectual Property and its protection through various laws	66.67	75	68.336	65	-	
	CO2	apply the knowledge of IPR for professional development	61.33	68	62.664	65	2.34	Given extra assignments to students. Also conducted extra classes
	CO3	Identify the appropriate data structures to solve specific problems	64	62	63.6	65	1.4	
	CO4	develop a platform for protection and compliance of Intellectual Property Rights & knowledge	64	71	65.4	65	-	
	CO5	create awareness amidst academia and industry of IPR and Copyright compliance	60	65	61	60	-	
	CO6	deliver the purpose and function of IPR and patenting	60	62	60.4	60	-	

DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (July- December 2020)

Course Curriculum Feedback - UG 2nd Year Section A & B

Bar chart showing feedback ratings (scale 0 to 5) for the following courses:
- 150301 Digital Electronics A: 3.1, 3.4, 3.1, 3.4, 3.4, 3.3, 3.3
- 150301 Digital Electronics B: 4.1, 4, 4.5, 4.3, 4, 3.8, 4
- 150302 Data Structures A: 3, 3, 3.1, 3.1, 3.1, 3.2, 3.1
- 150302 Data Structures B: 3.8, 3.9, 3.9, 3.8, 3.8, 3.9, 3.9
- 150303 Computer Graphics A: 4.2, 4.4, 4, 4, 4, 4, 4
- 150304 OOPs B: 4.2, 4.2, 4.2, 4.2, 4.2, 4.2, 4.2
- 150304 OOPs A: 4, 4.1, 4.1, 4, 4.2, 4.3, 4.3

Legend:
- 1. The course is well designed
- 2. The syllabus units are balanced
- 3. The course will be useful for you in future
- 4. The learning material was available to you
- 5. The content was clear and easy to understand
- 6. The course meets your expectations
- 7. The course was relevant and updated for present needs

Course Code & Name	Mention the course / contents, which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
-	NIL	NIL	NIL

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (July- December 2020)

Course Curriculum Feedback - UG 3rd Year Section A & B

Bar chart data:

Course	1	2	3	4	5	6	7
150501 Discrete Structures A	4.2	3.8	4	3.8	3.8	4	4.2
150502 Software Engineering A	3.7	3.7	3.9	3.8	3.7	3.7	3.7
150503 Theory of Computation A	3.3	3.2	3.2	3.2	3.2	3.3	3.1
150503 Theory of Computation B	3.9	3.8	3.8	3.9	3.8	3.6	3.9
150504 Microprocessor and Interfacing A	3.3	3.3	3.5	3.4	3.3	3.2	3.1
150504 Microprocessor and Interfacing B	3.8	3.7	4	3.7	3.6	3.6	3.6

Legend:
- 1 .The course is well designed
- 3. The course will be useful for you in future
- 5. The content was clear and easy to understand
- 7. The course was relevant and updated for present needs
- 2. The syllabus units are balanced
- 4. The learning material was available to you
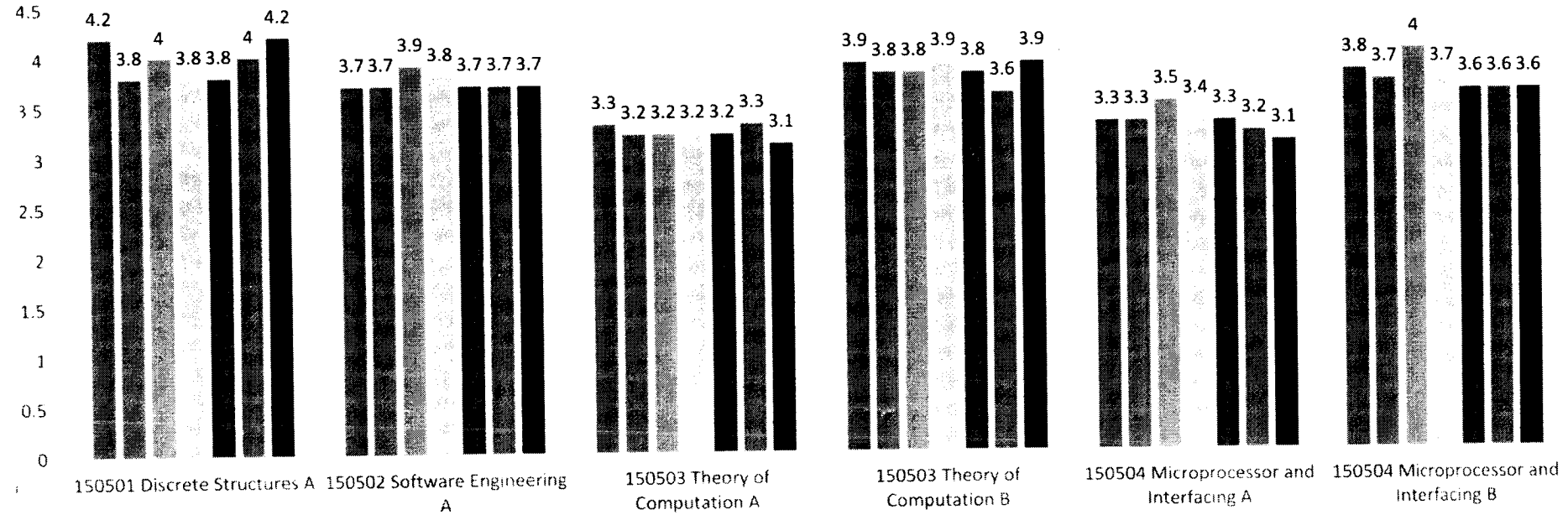- 6. The course meets your expectations

Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
-	NIL	NIL	NIL

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (July- December 2020)

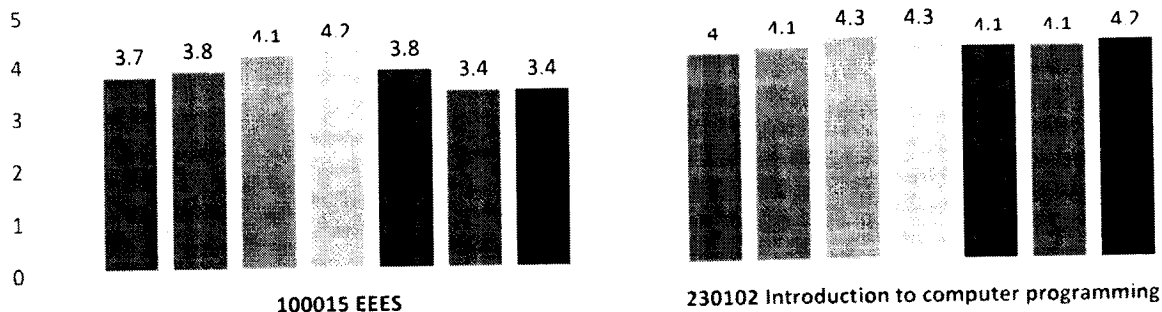| Course Code	Course Name	Action Taken
150302	Data Structures	Additional Notes and tutorial sheets were provided to students, and the syllabus of the course will be analyzed in upcoming BoS meeting.
150503	Theory of computation	New and updated topics (with higher applicability in current market/industry) should be added after thorough discussion in the BoS meeting.
150504	Microprocessor & Interfacing	The course content was suggested for analysis and neccesary updation in the upcoming BoS meeting.

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 58 - First Year

100015 EEES

3.7 3.8 4.1 4.2 3.8 3.4 3.4

230102 Introduction to computer programming

4 4.1 4.3 4.3 4.1 4.1 4.2

■ 1 .The course is well designed
■ 2. The syllabus units are balanced
※ 3. The learning material was available to you
  4. The content was clear and easy to understand
■ 5. The course was relevant and updated for present needs
■ 6. The course meets your expectations
■ 7. The course will be useful to meet your higher studies/future aspirations

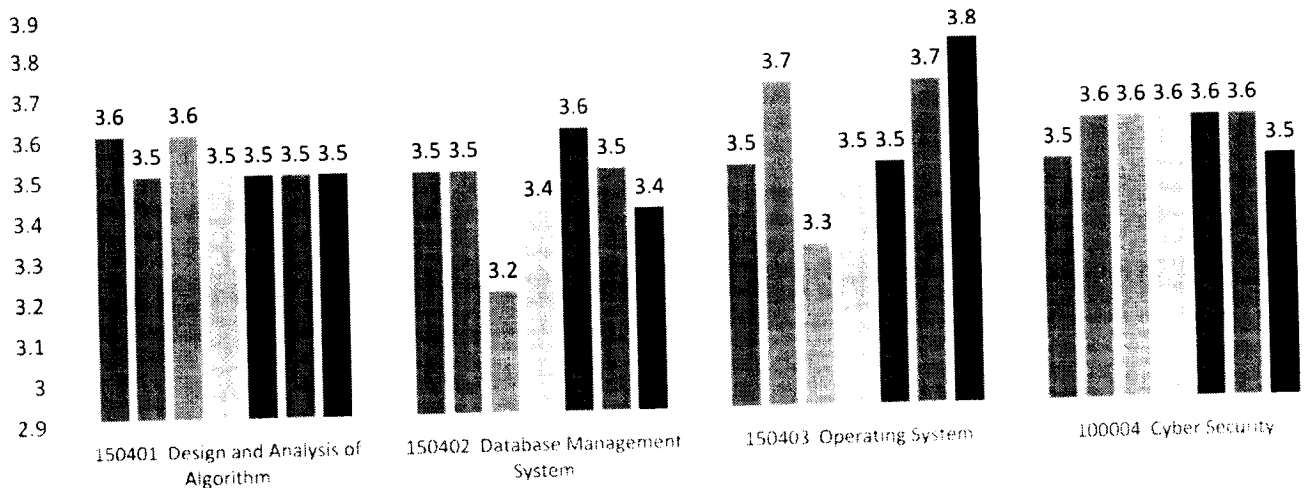| Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
230102 Intro. To computer programming	c language is outdated these days	Pointers arithmetic and more on pointers	Python should be included

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 38 - UG 2nd Year Section A

Bar chart with courses: 150401 Design and Analysis of Algorithm, 150402 Database Management System, 150403 Operating System, 100004 Cyber Security

- 1 .The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your expectations
- 7. The course will be useful to meet your higher studies/future aspirations

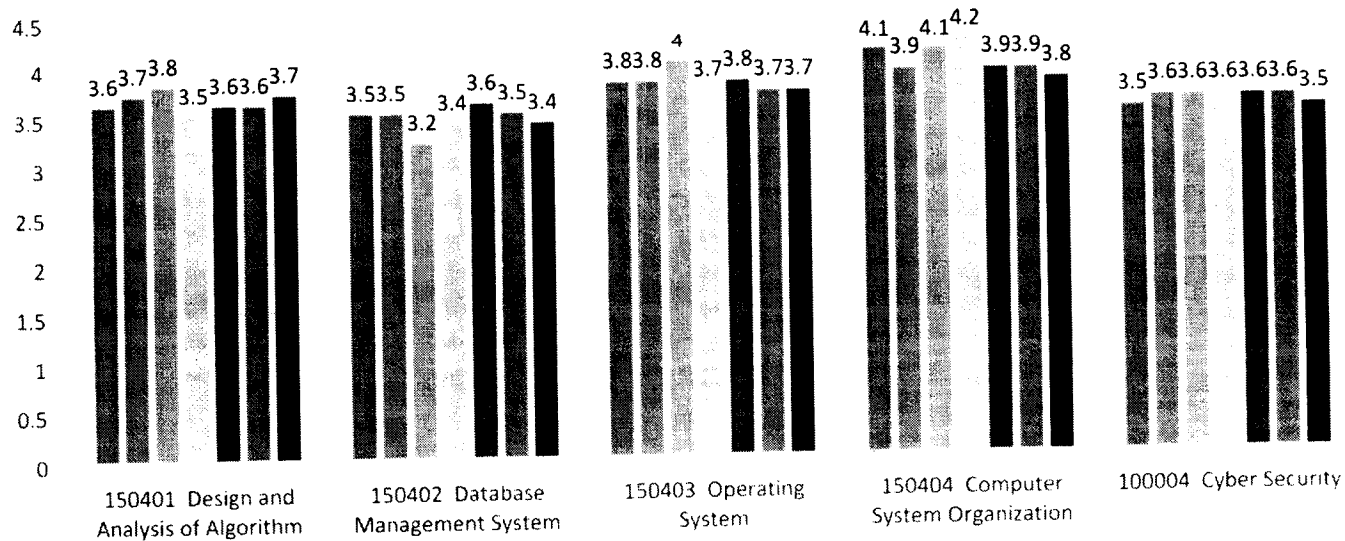| Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
-	NIL	NIL	NIL

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE

Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 43 - UG 2nd Year Section B

Bar chart showing feedback ratings for courses:

- **150401 Design and Analysis of Algorithm**: 3.6, 3.7, 3.8, 3.5, 3.6, 3.6, 3.7
- **150402 Database Management System**: 3.5, 3.5, 3.2, 3.4, 3.6, 3.5, 3.4
- **150403 Operating System**: 3.8, 3.8, 4, 3.7, 3.8, 3.7, 3.7
- **150404 Computer System Organization**: 4.1, 3.9, 4.1, 4.2, 3.9, 3.9, 3.8
- **100004 Cyber Security**: 3.5, 3.6, 3.6, 3.6, 3.6, 3.6, 3.5

■ 1 .The course is well designed

■ 2. The syllabus units are balanced

■ 3. The learning material was available to you

4. The content was clear and easy to understand

■ 5. The course was relevant and updated for present needs

■ 6. The course meets your expectations

■ 7. The course will be useful to meet your higher studies/future aspirations

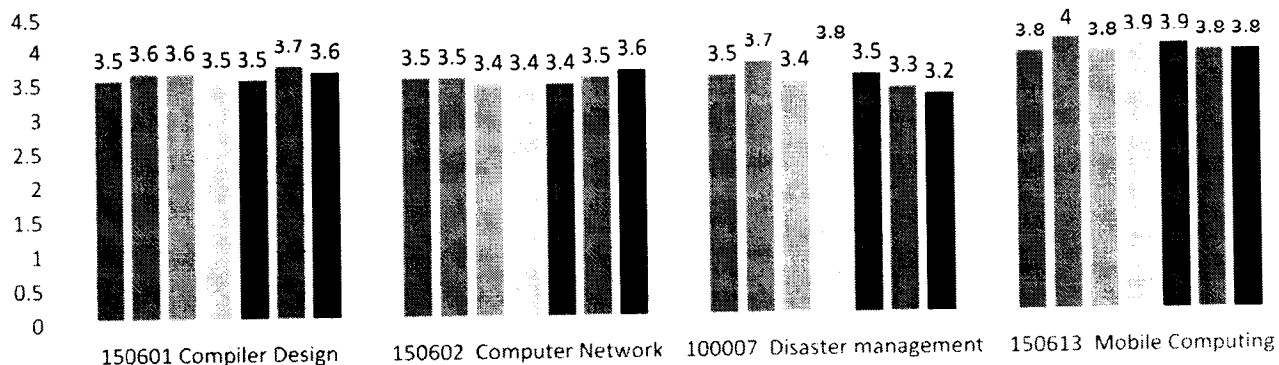| Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
-	NIL	NIL	NIL

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 36 - UG Third Year Section A

- 1. The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your expectations
- 7. The course will be useful to meet your higher studies/future aspirations

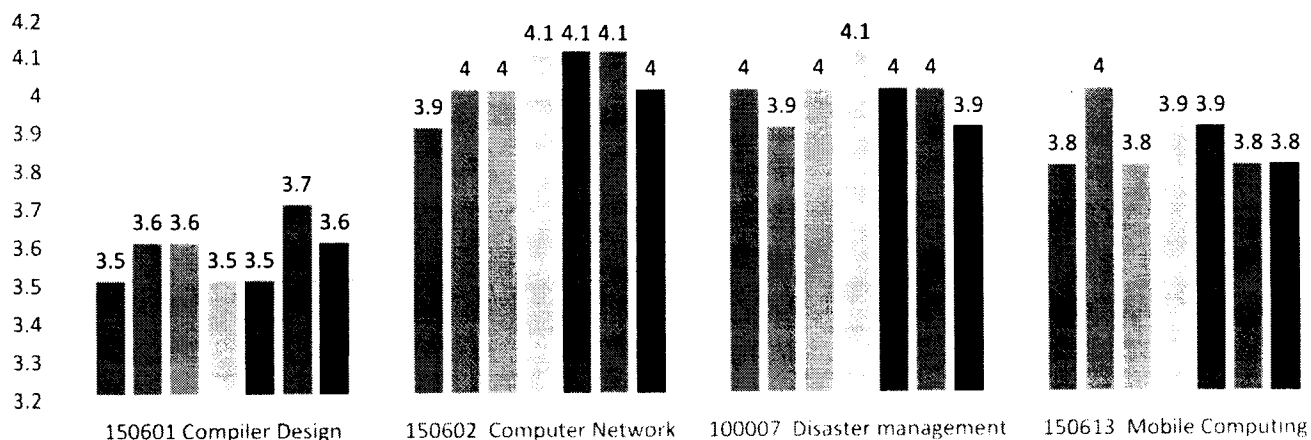| Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
150601 Compiler Design	NIL	NIL	Programming languages like Python &data science.

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 39 - UG Third Year Section B

1. The course is well designed
2. The syllabus units are balanced
3. The learning material was available to you
4. The content was clear and easy to understand
5. The course was relevant and updated for present needs
6. The course meets your expectations
7. The course will be useful to meet your higher studies/future aspirations

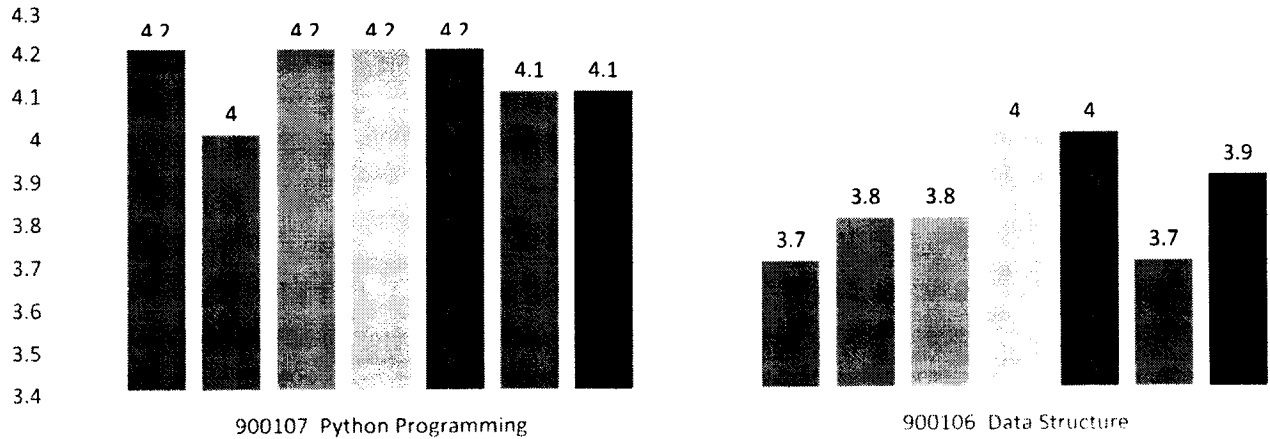| Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
150602 Computer Networks	Topologies	Layers	NIL
150601 Compiler Design	NIL	NIL	Programming languages like Python & data science.

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 35 - UG Third Year Open Category Courses

900107 Python Programming

900106 Data Structure

- 1 .The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your expectations
- 7. The course will be useful to meet your higher studies/future aspirations

Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
-	NIL	NIL	NIL

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE

Course Curriculum Feedback Analysis (Jan – June 2021)

Sample Size: 11 - PG First Year

- 1 .The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your expectations
- 7. The course will be useful to meet your higher studies/future aspirations

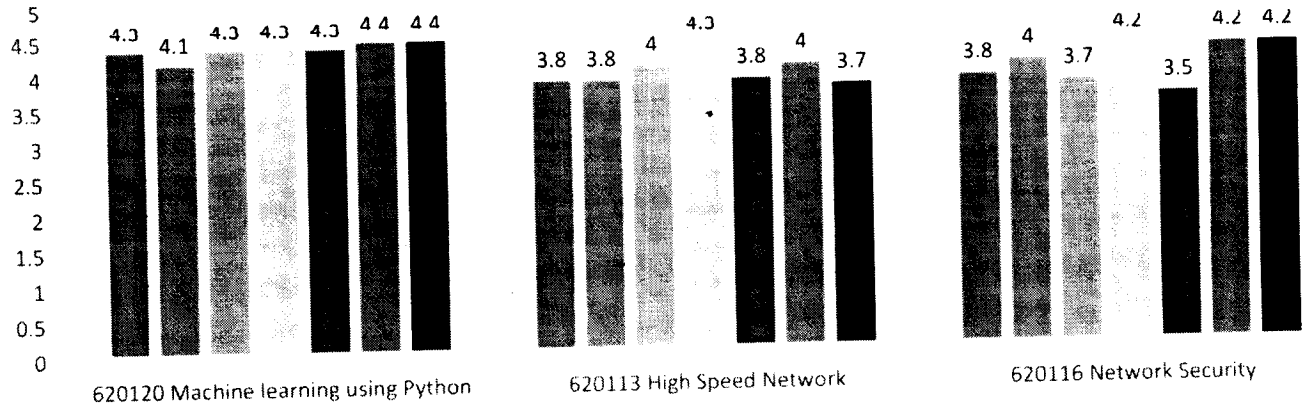| Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
Network Security, 900106	NIL	AI	NIL

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (Jan – June 2021)

ACTION TAKEN

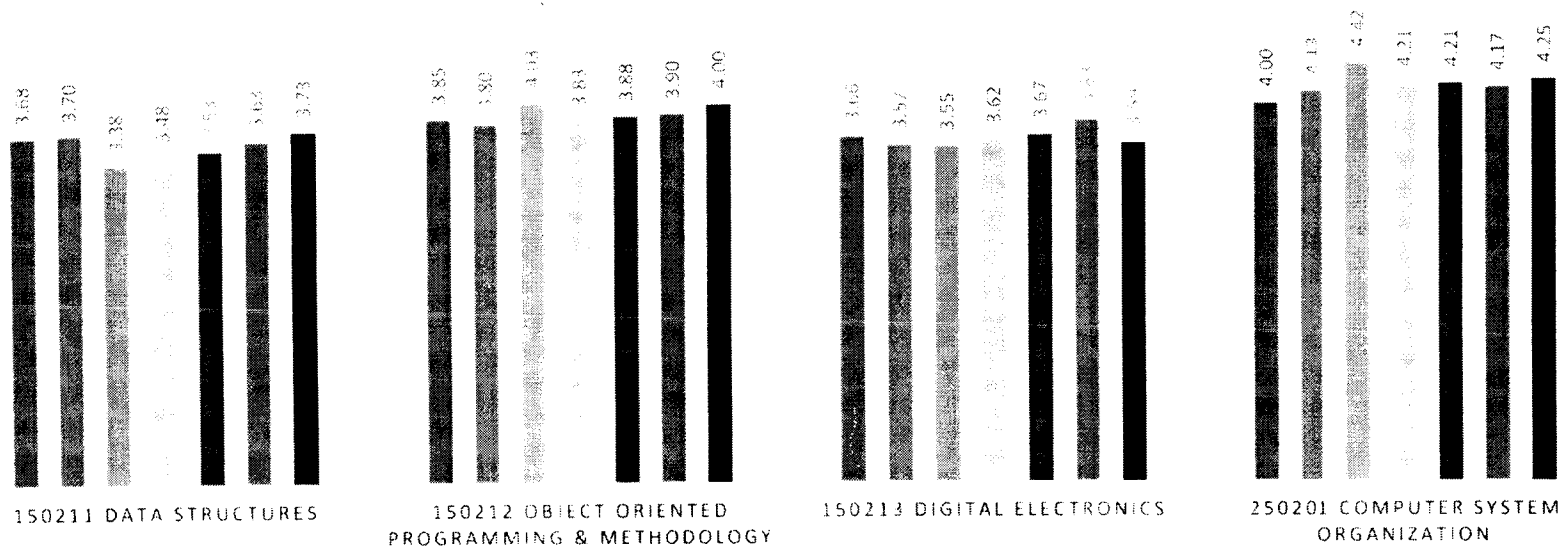| Course Code	Course Name	Action taken
230102	Intro. to computer programming	The courses like python programming and machine learning will be suggested to be incorporated in the curriculum after discussion in the BoS meeting.
150402	Database Management system	Instructed the concerned faculties to provide the learning material to the students timely and try to explain the contents in easily manner by taking real life examples.
150403	Operating System	Provided additional learning material and t-sheets to the students and instructed the faculties for timely sharing of lecture materials.
100007	Disaster management	Necessary changes in the course content, to meet the needs of CSE students, should be made after thorough discussion in the BoS meeting.
150601	Compiler Design	New and updated topics (with higher applicability in current market/industry) should be added after thorough discussion in the BoS meeting.

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DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (April– July 2021)

SAMPLE SIZE: 64 - UG 1ST YEAR

- 1 .The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your expectations
- 7. The course will be useful to meet your higher studies/future aspirations

150211 DATA STRUCTURES   150212 OBJECT ORIENTED PROGRAMMING & METHODOLOGY   150213 DIGITAL ELECTRONICS   250201 COMPUTER SYSTEM ORGANIZATION

Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
150211 Data structures	NA	Trees concept	NA
150213 Digital electronics	Unit-4	NA	NA

DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (April– July 2021)

SAPMLE SIZE: 11 - PG 1ST YEAR

■ 1 .The course is well designed

■ 2. The syllabus units are balanced

▩ 3. The learning material was available to you

4. The content was clear and easy to understand

■ 5. The course was relevant and updated for present needs

■ 6. The course meets your expectations

■ 7. The course will be useful to meet your higher studies/future aspirations

| 620211 ALGORITHM DESIGN TECHNIQUES & ANALYSIS | 620212 ADVANCDE TOPICS IN DATA MINING & WAREHOUSING | 620213 IMAGE PROCESSING & RETRIVEL TECHNIQUE | 620215 DEEP LEARNING |
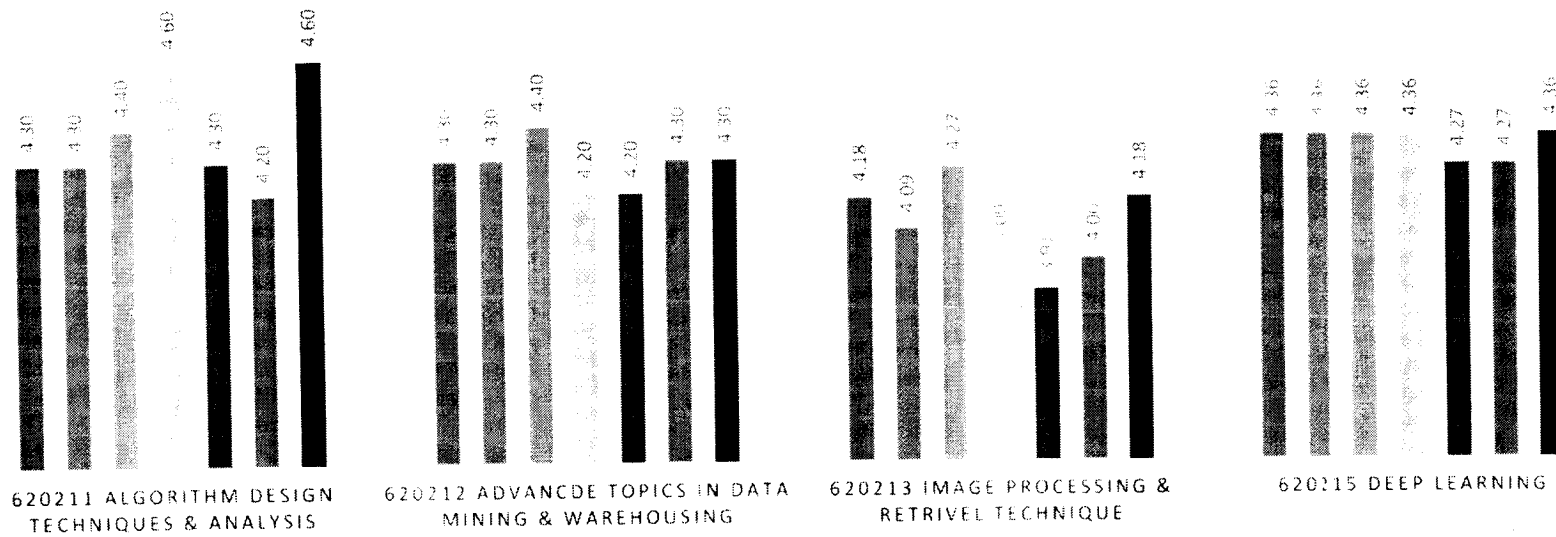
Course Code & Name	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
-	NA	NA	NA

Semester wise Analysis:

DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (April– July 2021)

UG 2nd Semester:

Subject Code	Subject Name	Semester	Faculty Name	Excellent in %	Very good in %	Good in %	Satisfactory in %	Poor in %
150211	Data Structures	2	Prof. Sheo Kumar	18.22	32.86	38.22	10.71	0
150212	Object Oriented Programming & Methodology	2	Prof. Mohit Jain	24.64	44.64	26.43	4.29	0
150213	Digital Electronics	2	Prof. Julie Kumari	16.26	37.93	39.41	6.40	0
250201	Computer System Organization	2	Prof. Anjula Mehto	45.83	30.36	21.43	2.38	0

UG 2nd Sem, Sample Size: 64

On an average 26% students are Excellent, 37% are very good, 31% are good, 6% are satisfactory and 0% are poor with the current syllabus of the various programmes designed by the Department of Computer science & engineering, MITS Gwalior.
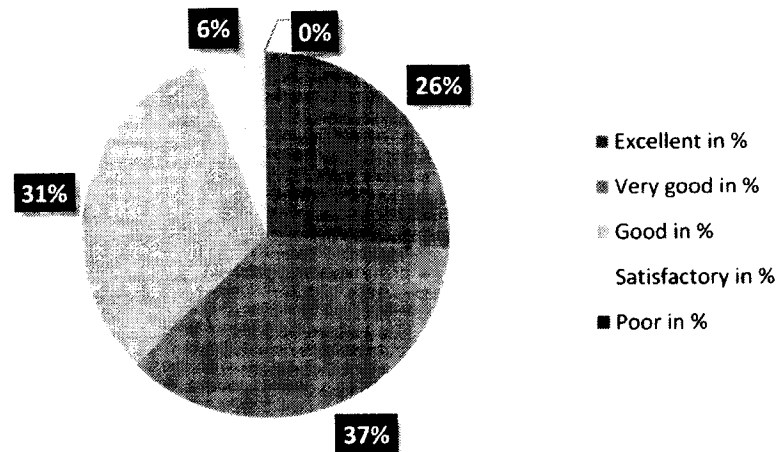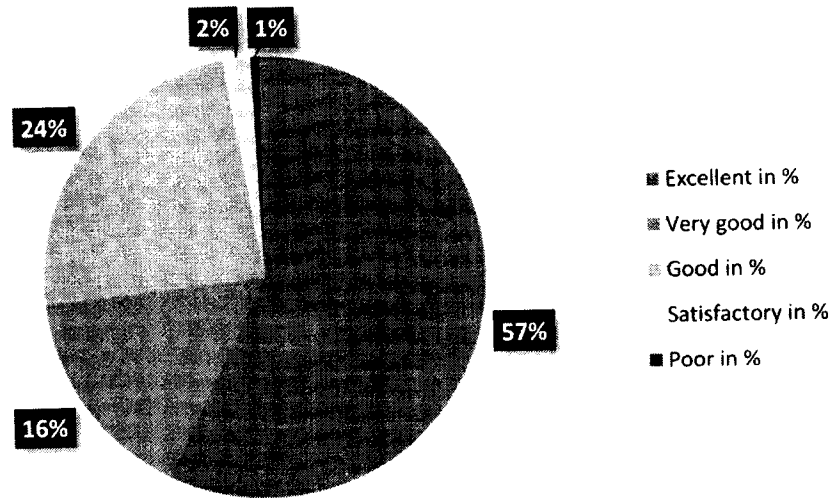
DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (April– July 2021)

PG 2nd Semester:

Subject Code	Subject Name	Semester	Faculty Name	Excellent in %	Very good in %	Good in %	Satisfactory in %	Poor in %
620211	Algorithm Design Techniques & Analysis	2	Prof. Aishwarya	62.86	12.86	24.29	0	0
620212	Advanced Topics in Data Mining & Warehousing	2	Prof. Sneha Garg	62.86	7.14	25.71	4.29	0
620213	Image Processing & Retrivel Technique	2	Prof. Ram Parvesh Das	46.75	24.68	22.08	3.90	2.60
620215	Deep Learning	2	Prof. Lav Upadhyay	57.14	19.48	23.38	0	0

PG 2nd Sem, Sample Size: 11

- Excellent in %
- Very good in %
- Good in %
- Satisfactory in %
- Poor in %

On an average 57% students are Excellent, 16% are very good, 24% are good, 2% are satisfactory and 1% are poor with the current syllabus of the various programmes designed by the Department of Computer science & engineering, MITS Gwalior.

DEPARTMENT OF CSE
Course Curriculum Feedback Analysis (April– July 2021)

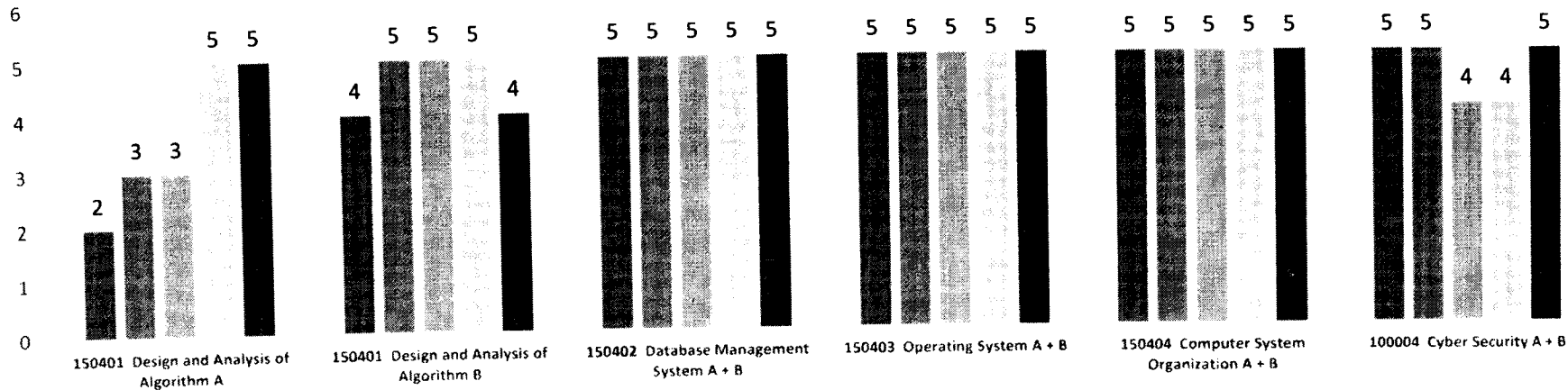| Course Code	Course Name	Action Taken
150211	Data structures	As per the feedback from students, some of the topics like trees and graphs in the course will be discussed in the BoS meeting and necessary updation will be done (if needed).
150213	Digital electronics	Entire syllabus is referred to be analyses and discussed in the BoS meeting for necessary removal of outdated content/topics.
620213	Image processing & Retrieval Techniques	The syllabus is forwarded to the concerned course committee for necessary updations (if needed).

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021) - UG 2nd Year

Bar chart showing feedback scores for courses: 150401 Design and Analysis of Algorithm A; 150401 Design and Analysis of Algorithm B; 150402 Database Management System A + B; 150403 Operating System A + B; 150404 Computer System Organization A + B; 100004 Cyber Security A + B

■ 1. The availability of books & E-learning material in the institute is good. (Please give your opinion)

▓ 2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?

▨ 3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.(If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]

■ 5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

Course with section	The environment of department/institute is conducive for innovative teaching and research. (Please comment)	The institute supports you in your initiatives for updating your knowledge/skills and in achieving career growth. (Please comment)	The institute provides basic infrastructural facilities required for teaching learning. (Please comment)	You get academic freedom to implement your ideas and conduct your courses without interference from authorities. (Please comment)	In general you are satisfied with your work environment and institute culture..(Please comment)	(i) Honours:	(ii) Minor specialization:	(iii) Departmental electives:	(iv) Open electives:
150401 Design and Analysis of Algorithm A	It's good	Yes	Yes	Yes	Yes	-	-	-	-
150402 Database Management System A + B	yes	Yes	Yes	Yes	Yes	IoT	Artificial Intelligence	Computer Network	Language Python
150403 Operating System A	good environment	Yes Helpful	Yes	Yes	Satisfied	-	-	Ethical Hacking	
150403 Operating System B	Yes	-	Yes	-	-	-	-	-	-
150404 Computer System Organization A	good environment	Yes Helpful	Yes	Yes	Satisfied			Ethical Hacking	
150404 Computer System Organization B	Agree, we are given freedom to explore new mediums to be better faculty	Agree	Agree	Agree	Agree	-	-	-	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

JAN-JUNE 2021 - UG 2nd Year:

Curriculum Evaluation Point	Response in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The availability of books & E-learning material in the institute is good. (Please give your opinion)	0	12.5	0	12.5	75
2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?	0	0	12.5	0	87.5
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)	0	0	12.5	12.5	75
4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]	0	0	0	12.5	87.5
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	12.5	87.5

Strongly disagree 0%

Disagree 12%

Neutral

Strongly agree 75%
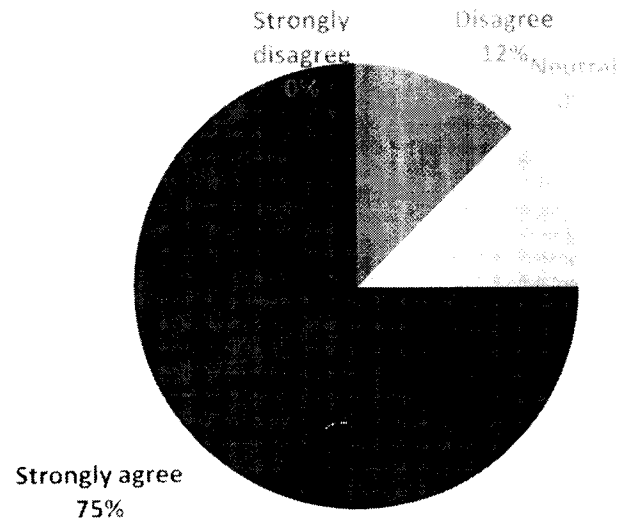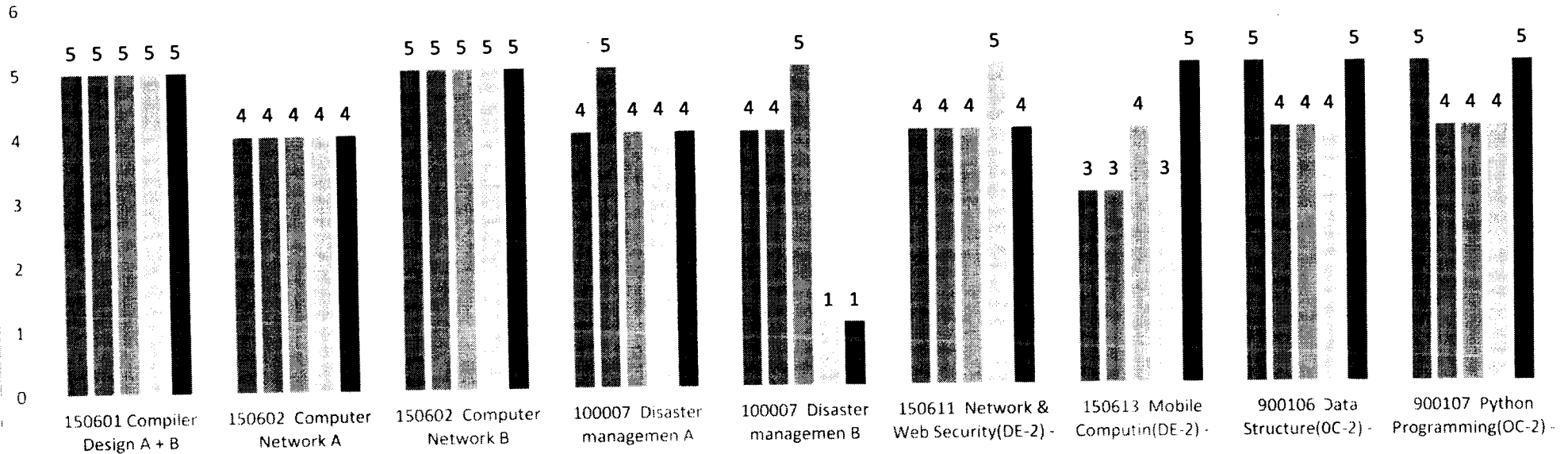
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021) - UG Third Year

■ 1. The availability of books & E-learning material in the institute is good. (Please give your opinion)

■ 2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?

▨ 3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.(If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]

■ 5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

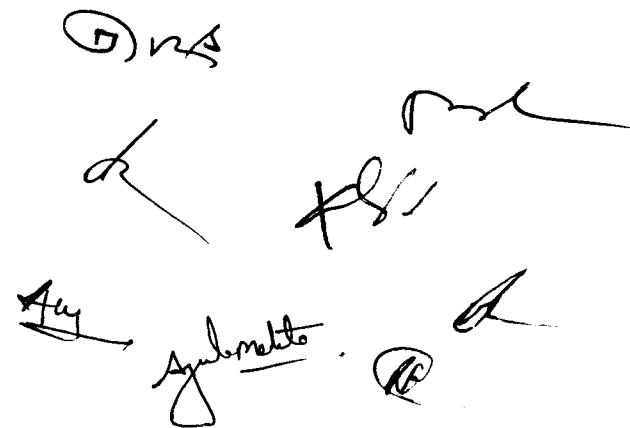| Course with section	The environment of department/institute is conducive for innovative teaching and research. (Please comment)	The institute supports you in your initiatives for updating your knowledge/skills and in achieving career growth. (Please comment)	The institute provides basic infrastructural facilities required for teaching learning. (Please comment)	You get academic freedom to implement your ideas and conduct your courses without interference from authorities. (Please comment)	In general you are satisfied with your work environment and institute culture..(Please comment)	(i) Honours:	(ii) Minor specialization:	(iii) Departmental electives:	(iv) Open electives:
150601 Compiler Design A + B	Good Environment	Yes Helpful	Yes	Yes	Satisfied	-	-	Ethical Hacking	-
150613 Mobile Computin(DE-2)	Yes	Yes	Yes	Yes	Yes	-	-	-	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

JAN-JUNE 2021 - UG 3rd Year:

Curriculum Evaluation Point	Response in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The availability of books & E-learning material in the institute is good. (Please give your opinion)	0	0	11.11111	44.44444	44.44444
2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?	0	0	12.5	50	37.5
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)	0	0	0	62.5	37.5
4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]	12.5	0	12.5	37.5	37.5
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	12.5	0	0	37.5	50

Strongly agree 44%
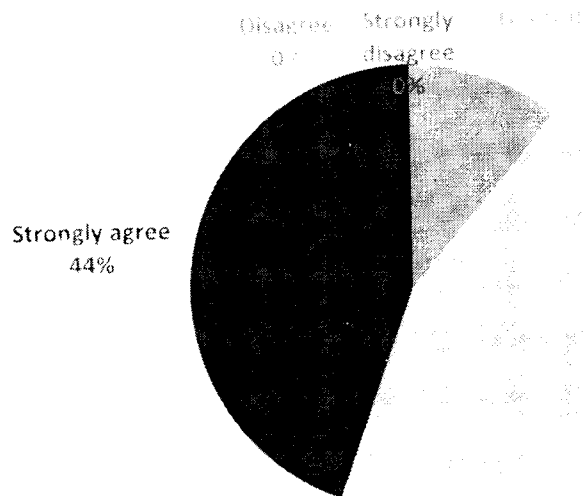
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF CSE
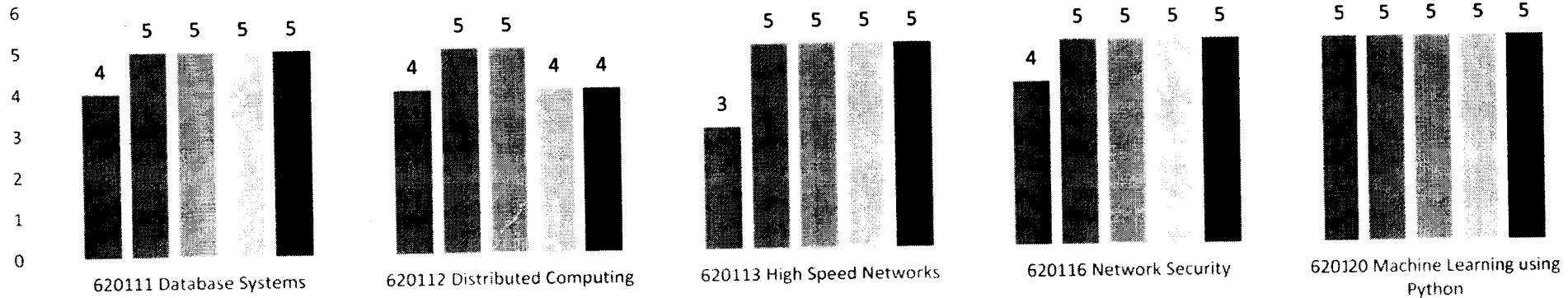## FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

FACULTY COURSE CURRICULUM FEEDBACK (DEC - MARCH 2021) - PG First Year

Bar chart showing feedback scores across courses:
- 620111 Database Systems: 4, 5, 5, 5, 5
- 620112 Distributed Computing: 4, 5, 5, 4, 4
- 620113 High Speed Networks: 3, 5, 5, 5, 5
- 620116 Network Security: 4, 5, 5, 5, 5
- 620120 Machine Learning using Python: 5, 5, 5, 5, 5

■ 1. The availability of books & E-learning material in the institute is good. (Please give your opinion)

■ 2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?

■ 3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

 4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]

■ 5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)

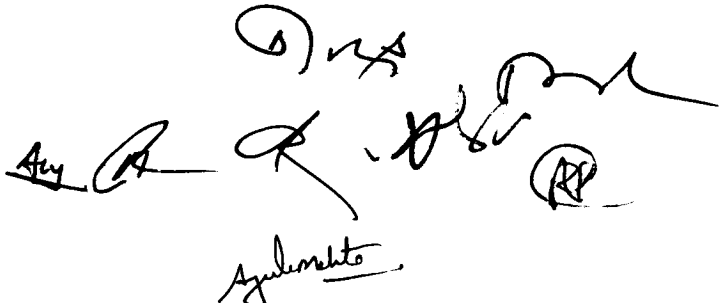# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

Dec. – March 2021 – PG Ist Year Ist Sem:

Curriculum Evaluation Point	Response in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The availability of books & E-learning material in the institute is good. (Please give your opinion)	0	0	20	60	20
2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?	0	0	0	0	100
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)	0	0	0	0	100
4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]	0	0	0	20	80
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	20	80

Strongly agree 20%

Strongly disagree 0%

Disagree 0%

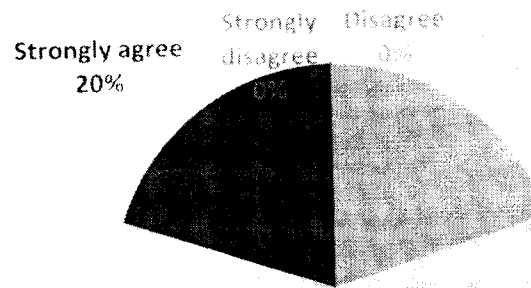# FACULTY COURSE CURRICULUM FEEDBACK (MAR-JULY 2021) - PG
FIRST YEAR

1. The availability of books & E-learning material in the institute is good. (Please give your opinion)

2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?

3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]

5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF CSE
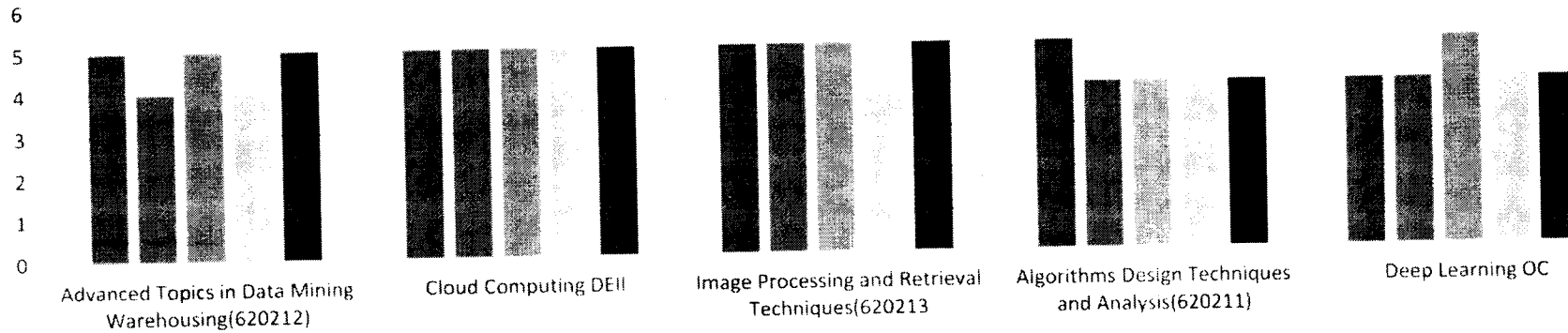## FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

March – July 2021 – PG Ist Year2nd Sem:

Curriculum Evaluation Point	Response in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The availability of books & E-learning material in the institute is good. (Please give your opinion)	0	0	0	20	80
2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?	0	0	0	60	40
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)	0	0	0	20	80
4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]	0	0	0	80	20
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	40	60

Strongly disagree 0%   Disagree 0%   Neutral

Strongly agree 80%

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)

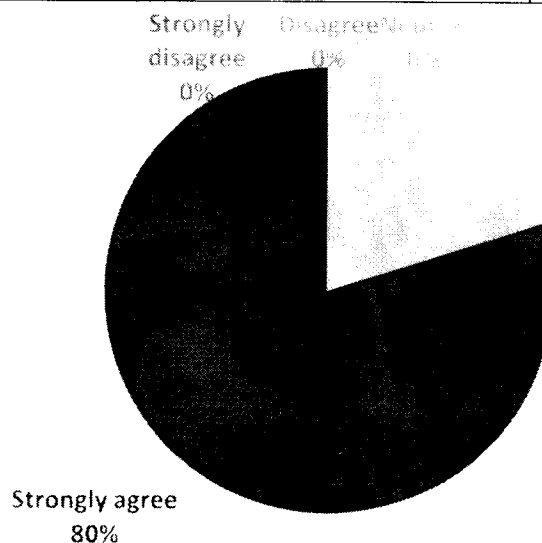## FACULTY COURSE CURRICULUM FEEDBACK (MAR-JULY 2021) - UG
FIRST YEAR

Bar chart with categories: Digital Electronic(150213), Object-Oriented Programming & Methodolog(150212), (Civil) Basic Computer Engineering(100023), (EE) Basic Computer Engineering, (ME/AU) Basic Computer Engineering 10002

■ 1. The availability of books & E-learning material in the institute is good. (Please give your opinion)

■ 2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?

■ 3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]

■ 5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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DEPARTMENT OF CSE
FACULTY COURSE CURRICULUM FEEDBACK (JAN-JUNE 2021)
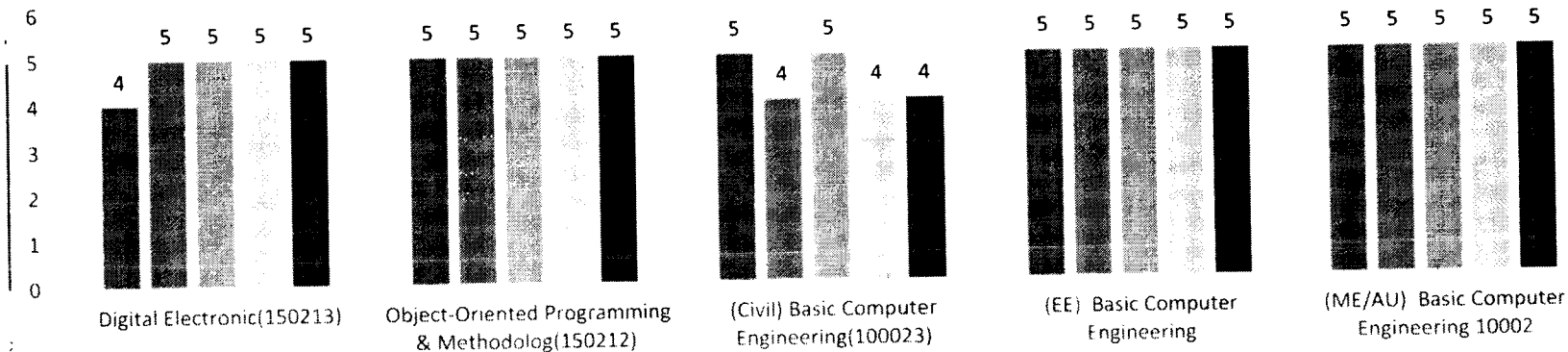
March – July 2021 – UG Ist Year 2nd Sem:

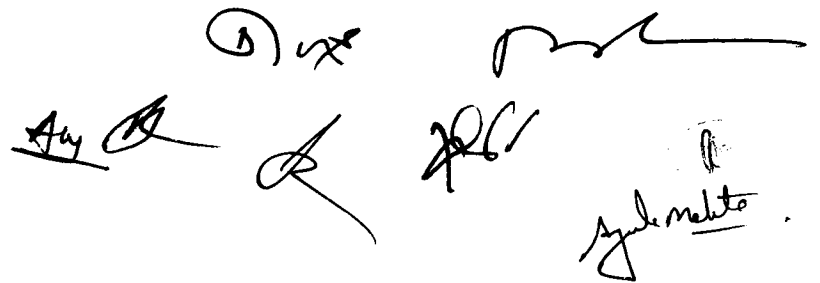| Curriculum Evaluation Point	Response in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The availability of books & E-learning material in the institute is good. (Please give your opinion)	0	0	0	20	80
2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?	0	0	0	20	80
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)	0	0	0	0	100
4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.[If you feel some changes (new content to be added or outdated content to be removed) are needed, please suggest]	0	0	0	20	80
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	20	80

Strongly disagree 0%
Disagree 0%
Strongly agree 80%

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of CSE

Parent – Teacher Feedback Summary (Jan. - June 2021)

Feedback Scale: 5 – Strongly agree, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Strongly disagree

Parameter (Average IGrading)	How do you rate the availability of books & E-learning material in the institute library / website?	Is any new course to be introduced- to meet current needs & technological changes?	How do you rate the quality and relevance of the courses included in the programme of study	Your ward demonstrates knowledge of the recent trends and developments in the field	the institute provides good support for improving overall personality of your ward.	The teaching, learning and evaluation system in the institute is good	The institute conducts many activities that help your ward in getting job opportunities and campus placement.	The infrastructure, other facilities and ambience of the institute is good.	In general you are happy and satisfied with the institute.
First Year	3.6	3.4	3.8	4	3.6	3.6	3.5	3.4	3.7
Second year	3.4	3.6	3.7	4.2	4.3	4.2	4.4	4.4	4.5
Third Year	4.2	4.4	4	4.2	3.6	4.4	4.2	3.7	3.4
Fourth Year	3.4	3.6	4	3.8	4	3.8	3.4	3.8	3.8
M. Tech CSE	3.4	3.8	4	4	3.6	4.1	3.1	3.7	3.8
MCA I Year	3.9	4	4	3.9	3.9	3.8	3.8	3.8	4.2
MCA II Year	3.7	3.8	3.9	4	3.8	4	3.7	3.8	3.9
Percentage of Satisfaction	73.14	76	78.29	80.29	76.57	79.71	74.57	76	78
Level of Satisfaction	Very Good	Very Good	Very Good	Excellent	Very Good	Very Good	Very Good	Very Good	Very Good

Explanation :

<50 %	Below Average
50% to 60%	Average
60% - 70%	Good
70% - 80%	Very Good
Greater than 80%	Excellent

Other Comments/ Suggestions by Parents:

In my suggestion, The academic calendar is hectic. Many students are dealing with family losses every 2-3 weeks yet they are complied to attend their quizzes and Assignments even when their mental health isn't good. The institute should give some time to the first-year students, a week break or something like that. When every other institute can give a break to their students then certainly, Our Prestigious college can offer it, too. Thanks.

Course of web development should be present.

Too much time spent on devices, a little change in schedule would be good

Quiz must to be taken on saturday.

If you take quiz on sunday it will destroy students only free day .if in case you take quiz in any other day then a proper alert on whatsapp is must.
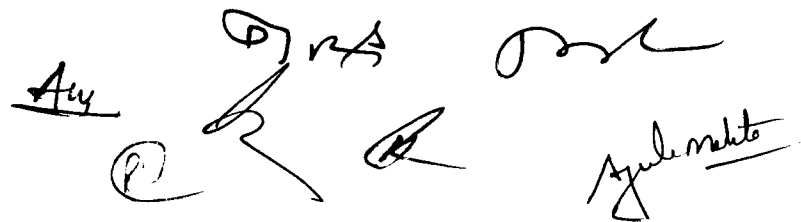
The faculty ensure that he/she:

Upload recording, notes , ppt etc daily.

you should reduce the fee. As we are not using any library facility, lab . and many other you should reduce fee of 2nd year .

Fast the process of scholarship.

Many a student have submitted their document 3 or 4 months ago but they are still remain for verification at institute level.

Graphical Representation of Parent – Teacher Feedback (Jan. - June 2021)

■ How do you rate the availability of books & E-learning material in the institute library / website?
■ Is any new course to be introduced- to meet current needs & technological changes?
   How do you rate the quality and relevance of the courses included in the programme of study
■ Your ward demonstrates knowledge of the recent trends and developments in the field
■ the institute provides good support for improving overall personality of your ward.
   The teaching, learning and evaluation system in the institute is good
■ The institute conducts many activities that help your ward in getting job opportunities and campus placement.
   The infrastructure, other facilities and ambience of the institute is good.
■ In general you are happy and satisfied with the institute.

ALUMNI SATISFACTION SURVEY: Sample Size = 71

■ Strongly Disagree ■ Disagree   Neutral ■ Agree ■ Strongly Agree

Number of Responses

Do you find
yourself capable
of making a
good career ?

Do you feel that
you are capable
of learning new
things in the
constantly chan-
ging technolo-
gical world.

Are you able to
apply, analyze,
design and create
products and
solutions for real
life Computer
Science and En-
gineering prob-
lems

Do you feel that
you are able to
manage projects
in an ethical
manner and work
efficiently as a
member/leader of
multidisciplinary
teams.

Summary Sheet

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Satisfaction Index
Do you find yourself capable of making a good career ?	1	1	2	27	40	4.46
Do you feel that you are capable of learning new things in the constantly changing technological world.	0	1	2	29	39	4.49
Are you able to apply, analyze, design and create products and solutions for real life Computer Science and Engineering problems	1	1	10	36	23	4.11
Do you feel that you are able to manage projects in an ethical manner and work efficiently as a member/leader of multidisciplinary teams.	0	2	9	37	23	4.14

**Alumni Satisfaction Index has been calculated on 5 Point Scale
(5: Strongly Agree, 4: Agree, 3: Neutral, 2: Disagree, 1: Strongly Disagree)**

EMPLOYER SATISFACTION SURVEY : Sample Size : 62
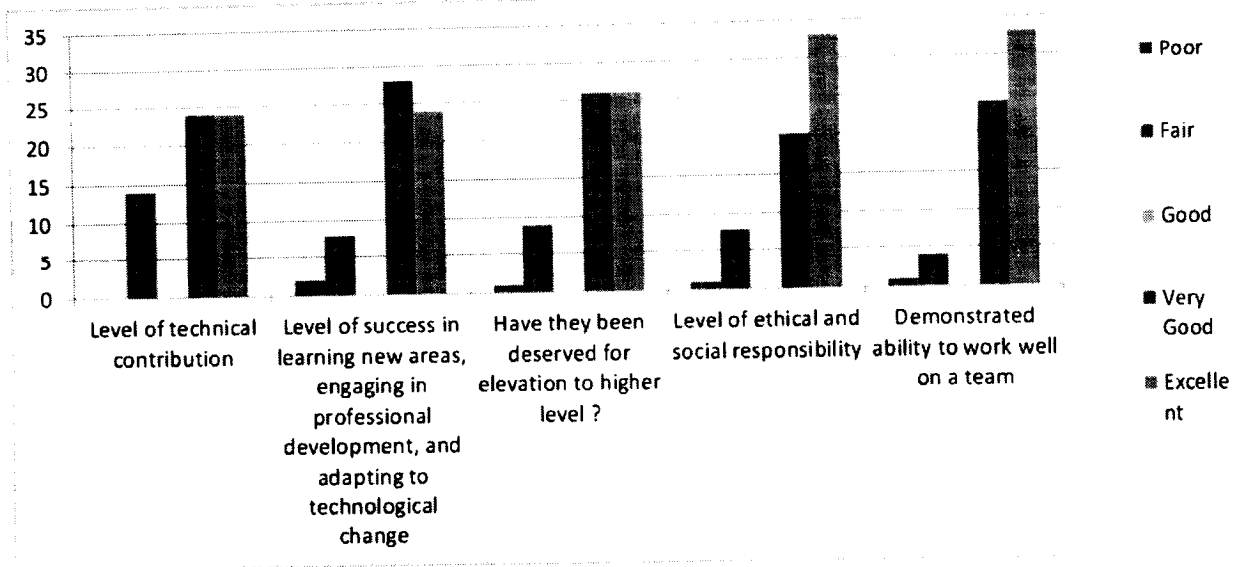
SUMMARY SHEET (Employer Satisfaction Survey) Sample Size : 62

Parameter (Average Grading)	Poor	Fair	Good	Very Good	Excellent	Employer Satisfaction Index
Level of technical contribution	0	14	0	24	24	3.94
Level of success in learning new areas, engaging in professional development, and adapting to technological change	2	8	0	28	24	4.03
Have they been deserved for elevation to higher level ?	1	9	0	26	26	4.08
Level of ethical and social responsibility l	1	8	0	20	33	4.23
Demonstrated ability to work well on a team	1	4	0	24	33	4.35

Employer Satisfaction Index (ESI) (on a scale of 5) (5: Excellent, 4: Very Good, 3: Good, 2: Fair, 1: Poor)

STUDENTS EXIT SURVEY FEEDBACK
Summary Sheet- 2021 BATCH: Sample Size : 115

Parameter	Excellent	Very Good	Good	Above Average	Average
Rate the Faculty Teaching Approach in the UG or PG Programs:	8	28	56	9	14
How were the teaching methods of faculty ?	8	24	51	16	16
How was the usage of Learning and Technological Resources like LCD Projectors. Online Boards. Multimedia etc. by faculty in the class?	9	20	40	23	23
The full Syllabus of courses was completed through regular and additional/remedial classes	15	26	43	14	17
Relevance of Course curriculum or Program to Your Career Goals or Further Study:	9	25	46	15	20
How was the teachers preparedness and communication in the class?	15	31	47	7	15
Does Faculty communicate to you about Course Outcomes (CO). Program Outcomes (PO) and expected learning & competencies from the course?	14	26	49	13	13
Institute helps you to improve your soft skills. life skills and employability skills to make you ready for Industry or Placements -	8	30	41	13	23
Institute support in Internships. Industrial Visits. Project work. Students exchange and other related activities was	7	19	42	20	27
How were the Student Organizations. Technical & Social Clubs for your overall growth and learnings ?	13	33	44	6	19
Promotion and Encouragement by Institute Department for participation in Curricular and Extra-Curricular activities for development of students was	10	30	51	4	20
Quiz and assignments given by Faculty were helpful in learning?	15	28	46	13	13
Fairness of Internal Evaluation process by faculty	13	39	40	5	18
Library Resources in the Areas of Engineering. Research. Journals & e-Journals. Technical Magazines etc.	13	30	36	17	19
The flexible curriculum caters to individual career needs by providing choice of subjects. In your opinion. this curriculum approach is	9	32	48	7	19
In the changing world knowledge of new technology and domains is expected from graduates. The NPTEL-MOOCs will help students in becoming self-learners and future ready	16	30	36	14	19
First time an opportunity was given for a full VIII semester internship project. This provision will help in the career planning and growth for you and the future batches.	25	37	36	5	12
Training & Placement Support	11	24	33	17	30

EXIT SURVEY (on a scale of 5) (5: Excellent. 4: Very Good. 3: Good. 2: Above Average. 1: Average)
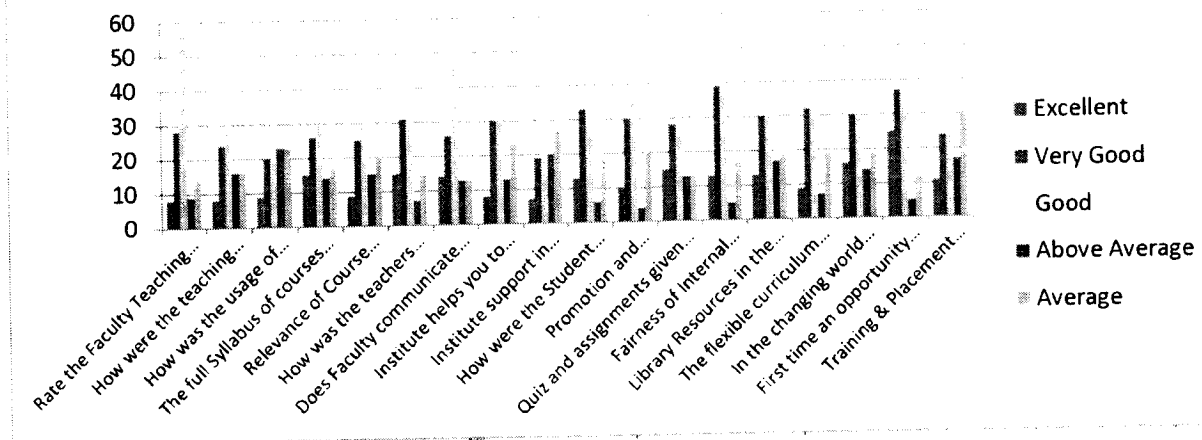
Madhav Institute of Technology and Science, Gwalior

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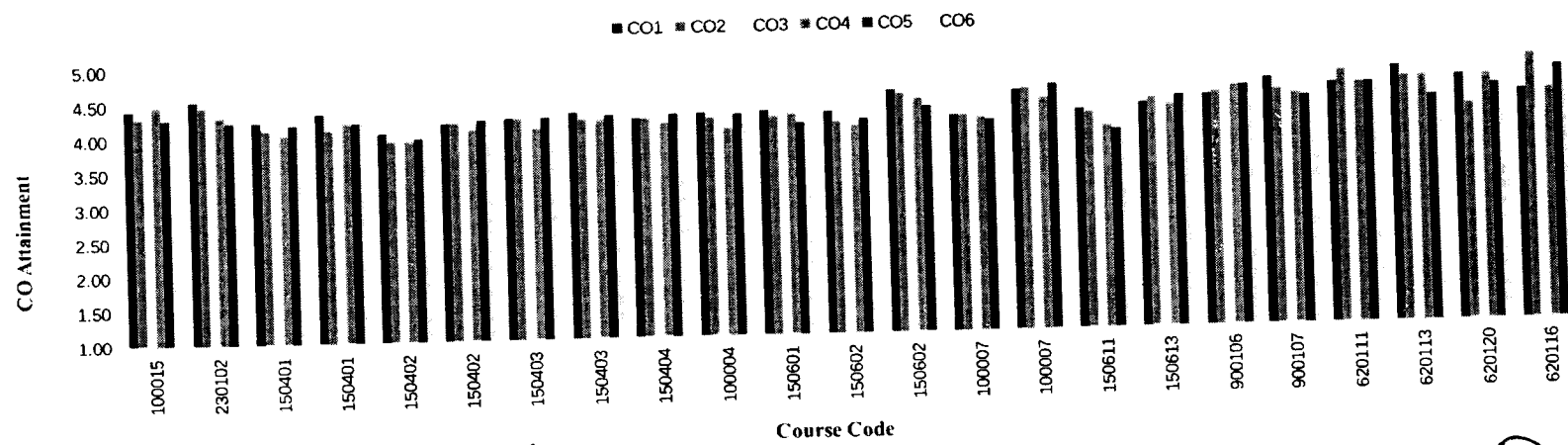
Department of Computer Science & Engineering

COURSE OUTCOMES FEEDBACK (JAN-JUNE 2021)

Parameters for the feedback: Average: 3pts; Agree: 4pts; Strongly Agree: 5pts

Feedback was taken on 5 point scale; Target set for each course = 4 (Agree)

S. No.	Subject Code	Subject Name	Sem	Section	Faculty Name	CO1	CO2	CO3	CO4	CO5	CO6	Overall CO Attainment	Gap
1	100015	Energy, Environment, Ecology & Society	1	A + B	Prof. Aishwarya	4.42	4.30	4.42	4.48	4.28	4.40	4.38	0
2	230102	Introduction to Computer Programming	1	A + B	Prof. Mir Shahnawaz	4.54	4.46	4.56	4.31	4.23	4.29	4.40	0
3	150401	Design and Analysis of Algorithms	4	A	Prof. Aishwarya	4.23	4.11	3.95	4.05	4.18	4.02	4.09	0
4	150401	Design and Analysis of Algorithms	4	B	Prof. Ashishika Singh	4.33	4.10	4.27	4.20	4.20	4.37	4.24	0
5	150402	Database Management System	4	A	Prof. Jaimala Jha	4.04	3.92	3.92	3.92	3.96	4.04	3.97	0.03
6	150402	Database Management System	4	B	Prof. Jaimala Jha	4.17	4.17	4.04	4.08	4.21	4.11	4.13	0
7	150403	Operating System	4	A	Dr. Rajni Ranjan Singh	4.23	4.23	4.23	4.08	4.23	4.15	4.19	0
8	150403	Operating System	4	B	Prof.Julie Kumari	4.29	4.20	4.10	4.17	4.24	4.20	4.20	0
9	150404	Computer System Organization	4	B	Prof. Ankita Sengar	4.19	4.19	4.00	4.13	4.25	4.00	4.13	0
10	100004	Cyber Security	4	A + B	Prof. Sneha Garg	4.25	4.18	4.12	4.03	4.22	4.00	4.13	0
11	150601	Compiler Design	6	A + B	Prof. Mahesh Parmar	4.27	4.18	4.27	4.20	4.08	4.16	4.19	0
12	150602	Computer Network	6	A	Prof. Khushboo Agrawal	4.24	4.09	4.09	4.03	4.12	4.12	4.12	0
13	150602	Computer Network	6	B	Prof. Pooja Agrawal	4.52	4.48	4.40	4.40	4.28	4.28	4.39	0
14	100007	Disaster Management	6	A	Prof. Ashishika Singh	4.15	4.15	4.22	4.11	4.07	-	4.14	0
15	100007	Disaster Management	6	B	Prof. Ankita Sengar	4.48	4.52	4.52	4.37	4.56	-	4.49	0
16	150611	Network & Web Security	6	DE-2	Prof. Amit Manjhwar	4.19	4.14	3.94	3.94	3.89	3.94	4.01	0
17	150613	Mobile Computing	6	DE-2	Prof. Jamvant Kumare	4.27	4.33	4.50	4.23	4.37	4.23	4.32	0
18	900106	Data Structure	6	OC-2	Prof. Sheo Kumar	4.37	4.41	4.37	4.48	4.48	4.33	4.41	0
19	900107	Python Programming	6	OC-2	Prof. Arun Kumar	4.59	4.41	4.47	4.35	4.32	4.24	4.40	0
20	620111	Database Systems	M. Tech.		Prof. Sheo Kumar	4.50	4.67	4.67	4.50	4.50	4.50	4.56	0
21	620113	High Speed Network	M. Tech.		Prof. Mohit Jain	4.71	4.57	4.29	4.57	4.29	4.43	4.48	0
22	620120	Machine Learning using Python	M. Tech.	OC-1	Prof. Arun Kumar	4.57	4.14	4.14	4.57	4.43	4.00	4.31	0
23	620116	Network Security	M. Tech.	DE-1	Prof. Lav Upadhyay	4.33	4.83	4.00	4.33	4.67	4.33	4.42	0

Impact: We have been regularly taking CO feedback in each semester and then propagating its analysis among the faculty members, Which has helped the department to attain almost all the COs and also helped to identify the weak areas.

■CO1 ■CO2 CO3 ✳CO4 ■CO5 CO6

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of Computer Science and Engineering

OC-II

Internet of Things (IoT)

800204

Course Objectives

- Familiarize student with the taxonomy and terminology of the internet of things
- Provide detail knowledge about various IoT protocols that facilitate the connection of things.
- Enable students to understand applicability of IoT in various other fields

Unit I

IoT Introduction and Fundamentals: Introduction to Internet of Things (IoT), Background, Applications where IoT can be deployed, Benefits/challenges of deploying an IoT, IoT components: Sensors, Types of sensors, Actuators, IoT Reference Architectures: oneM2M,

Unit II

IOT PROTOCOLS - IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah and LoRaWAN – Network Layer: IP versions, Constrained Nodes and Constrained Networks – Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks

Unit III

Design Methodology: Embedded computing logic – Microcontroller, System on Chips, IoT system building blocks, Arduino – Board details, IDE programming, Raspberry Pi – Interfaces and Raspberry Pi with Python Programming.

Unit IV

Cloud Computing in IoT: SDN for IoT, Data Handling and Analytics, Cloud Computing, Sensor-Cloud, Wireless communication for IoT: channel models, power budgets, data rates, IoT Security and Privacy, MQTT Protocol, Publisher and Subscriber Model, REST/HTTP

Unit V

Case Study & Industrial Applications: Cisco IoT system, IBM Watson IoT platform, IoT Agriculture and Farming, IoT Energy Solutions, IoT Smart Building Solutions, IoT Finance, IoT Healthcare, Industrial IoT.

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RECOMMENDED BOOKS

1. Arshdeep Bahga, Vijay Madisetti, —Internet of Things – A hands-on approach, Universities Press, 2015

2. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012

3. Internet of Things From Hype to Reality The Road to Digitization Second Edition, Ammar Rayes Samer Salam

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Course Outcomes:

CO1: Identify the everywhere presence of the internet of things

CO2: compare devices using various communication platforms

CO3: Analyze various protocols for IoT

CO4: Design a PoC of an IoT system using Raspberry Pi/Arduino

CO5: Apply data analytics and use cloud offerings related to IoT

CO6: explain different verticals where IOT can be used

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of Computer Science and Engineering

OC-II

Deep Learning

800205

Unit – I:
Introduction to Artificial Neural Networks: Introduction, History, capabilities, the perceptron. Feedforward Neural networks. Gradient descent and the backpropagation algorithm. Taxonomy Of Neural Network Architectures and Applications. Overfitting and generalization.

Unit – II:
Convolutional Neural Networks: Intro to CNNs. Convolution. Correlation, Filtering. CNN architectures. Case studies: Alex net. VGGNet. GoogLeNet. Detection and Segmentation. Visualizing and Understanding. CNNs for computer vision.

Unit – III:
Recurrent Neural Networks: RNN architecture, LSTM, GRU. Generative Adversarial Networks (GANs), Encoder Decoder architectures.

Unit – IV:
Deep Unsupervised Learning: Autoencoders – standard, sparse. denoising, contractive. etc. Variational Autoencoders, Adversarial Generative Networks, Autoencoder and DBM.

Unit – V:
Applications of Deep Learning: Image segmentation, object detection. automatic image captioning. Image generation with Generative adversarial networks. video to text with LSTM models. Parsing and Sentiment Analysis using Recursive Neural Networks.

RECOMMENDED BOOKS:

- CharuC.Aggarwal "Neural Networks and Deep learning" Springer International Publishing. 2018.
- Satish Kumar, "Neural Networks, A Classroom Approach", Tata McGraw -Hill. 2007.
- Simon Haykin, "Neural Networks. A Comprehensive Foundation". 2nd Edition, Addison Wesley Longman, 2001.
- Bishop, Christopher M. Pattern Recognition and Machine Learning. Springer. 2006

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COURSE OUTCOMES:

After completion of this course, the students would be able to:

CO1. Define the basic concepts in Neural Networks and applications
CO2. Explain Convolutional Neural Networks and their training issues
CO3. Illustrate the concepts of RNN and their applications
CO4. Apply the concepts of deep learning for solving real world problems.
CO5. Distinguish different types of ANN architectures
CO6. Evaluate various ANN architectures for Object Detection and image Retrieval.

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR –474005
(A Govt. Aided UGC Autonomous Institute Affiliated to R.G.P.V. Bhopal, M.P.)
Department of Computer Science and Engineering

Master of Technology (Computer Science and Engineering) (Semester II) Recommended W.E.F. July 2020

Scheme of Examination

S.N.	Subject Code	Subject Name	Theory Slot End. Sem.	Mid Sem.	Quiz/ Assignment	Practical Slot End Sem.	LabWork/ sessional	MOOC's Assignment	Exam	Total Marks	Contact Periods per week L	T	P	Total Credits
1	620211	Algorithm Design Technique and Analysis	70	20	10	-	-	-	-	100	3	-	-	3
2	620212	Advance Topic in Data Mining & Warehousing	70	20	10	-	-	-	-	100	3	-	-	3
3	620213	Image Processing and Retrieval Technique	70	20	10	-	-	-	-	100	3	-	-	3
4	DE	Department Elective-II (Through SWAYAM/NPTEL)	-	-	-	-	-	25	75	100	3	-	-	3
5	OC	Open Category Course(OC-2)	70	20	10	-	-	-	-	100	3	-	-	3
6	620221	Lab-II	-	-	-	90	60	-	-	150	-	-	4	4
7	620222	Self Learning/ Presentation	-	-	-	-	100	-	-	100	-	-	2	2
		Total	280	80	40	90	160	25	75	750	15		6	21

Elective II course will run though SWYAM/NPTEL/ MOOCs based learning platform (with credit transfer facility)
Open Category course (OC-2) will have to be opted from pool of open courses. This course will be based on interdisciplinary aspects.| This course may be run through SWYAM/NPTEL based platform(with credit transfer facility)and accordingly, OC-2 pool may be created from the list of SWYAM/NPTEL courses]
During labs, students has to perform practical/assignments/minor projects related to theory subjects/theoretical concepts of respective semester using recent technologies/ language/tools etc,
Self learning/ presentation through SWYAM/NPTEL(Registration in a course will be compulsory for the students bus assessment will be based on internal seminar presentation)

Subject Code	Subject Name (DE-2)
	DE-2
620216	Cloud Computing
620217	Social Networking
	OC-2
800204	Internet of Things
800205	Deep Learning

Self-Learning/ Presentation (620222) in II Semester (Batch admitted in 2020-21) M Tech

noc21-cs78	Python for Data Science

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Scheme
(I & II Semester)
of the
B. Tech. Programme
(Computer Science and Engineering)
Under Flexible Curriculum
[ITEM CSEIT -8]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)Annexure-14

Scheme of Examination
B.Tech. I Semester (Computer Science and Engineering)

For batches admitted in Academic Session 2020-21 Onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per Week			Total Credits	Mode of Teaching (Offline Online)	Mode of Exam
				Theory Slot				Practical Slot				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation								
				End Sem. Exam	Proficiency in subject /course	Mid Sem.	Quiz/Assignment		Lab work / Sessional	Skill Based mini Project							
1.	230102	DC	Introduction to Computer Programming	50	10	20	20	60	20	20	200	2	1	2	4	Offline (3/0)	A+O
2.	100022	ESC	Basic Electrical & Electronics Engineering	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	MCQ
3.	100020	ESC	Basic Civil Engineering & Mechanics	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	PP
4.	100021	ESC	Basic Mechanical Engineering	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	MCQ
5.	100015	HSMC	Energy, Environment, Ecology& Society	50	10	20	20	-	-	-	100	3	-	-	3	Online (0/3)	MCQ
6.	150111	DLC	IT workshop	-	-	-	-	60	20	20	100	-	-	4	2	Offline	SO
	Total			250	50	100	100	180	60	60	800	13	02	08	19		

Induction Programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

*Proficiency in course/subject – includes the weightage towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject

Mode of Teaching					Mode of Examination				Total Credits
Theory				Lab	Theory			Lab	
Offline	Online	Blended		Offline	PP	A+O	MCQ	SO	
		Offline	Online						
3	3	6	3	4	3	4	10	2	19
15.78	15.78	31.5	15.78	21.0	15.8	21.0	52.6	10.5	Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)<u>Annexure-14</u>

Scheme of Examination
B.Tech. II Semester (Computer Science and Engineering)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per Week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam
				Theory Slot				Practical Slot				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation								
				End Sem. Exam	^{S}Proficiency in subject /course	Mid Sem.	Quiz/Assignment		Lab work / Sessional	Skill Based mini Project							
1.	100011	BSC	Engineering Mathematics –I	50	10	20	20	-	-	-	100	3	1	-	4	Online	PP
2.	150211	DC	Data Structures	50	10	20	20	60	40	—	200	2	1	2	4	Blended	PP
3.	150212	DC	Object Oriented Programming & Methodology	50	10	20	20	60	20	20	200	3	-	2	4	Blended	A+O
4.	150213	DC	Digital Electronics	50	10	20	20	-	-	-	100	2	1		3	Blended	PP
5.	100016	HSMC	Technical Language	50	10	20	20	-	-	-	100	3	-	-	3	Blended	PP
6.	100017	HSMC	Language Lab	-	-	-	-	60	20	20	100	-	-	2	1	Offline	SO
			Total	250	50	100	100	180	80	40	800	13	03	06	19		

Summer Internship Project – I (Institute Level) (Qualifier): Minimum two-week duration: Evaluation in III Semester.

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

^{S}Proficiency in course/subject – includes the weightage towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject

Mode of Teaching					Mode of Examination				Total Credits
Theory				Lab	Theory			Lab	
Offline	Online	Blended		Offline	PP	A+O	MCQ	SO	
		Offline	Online						
4	-	8	4	3	14	4	-	1	19
21.0	-	42.10	21.0	15.78	73.68	21.0	-	5.26	Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Syllabi
(I & II Semester)
of the
B. Tech. Programme
(Computer Science and Engineering)
Under Flexible Curriculum

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Department of Computer Science and Engineering
INTRODUCTION TO COMPUTER PROGRAMMING
230102

COURSE OBJECTIVES

- To familiar with program readability/understanding including program style/formatting and self-documenting code.
- To familiar with debugging process.
- To design and implement basic programming solutions including statements, control structures, and methods.

Unit I

Introduction to Programming, Machine Level Languages, Assembly Level Languages, High Level Languages, Program Execution and Translation Process, Problem solving using Algorithms and Flowcharts. Introduction to C Programming: Data Types, Constants, Keywords, Operators & Expressions, Precedence of operators and input/output functions.

Unit II

Control Statements and Decision Making: The goto statement, The if statement, The if-else statement, Nesting of if statements, The conditional expression, The switch statement, The while loop, The do...while loop, The for loop, The nesting of for loops, The break and continue statement.

Unit III

Arrays, Strings & Pointers: One dimensional Arrays, Passing Arrays to Functions, Multidimensional Arrays, Strings, Basics of Pointers & Addresses, Pointer to Pointer, Pointer to Array, Array of Pointers, Types of pointers, Pointer to Strings.

Unit IV

Functions & Structures: Function Basics, Function Prototypes, Passing Parameter by value and by reference, Passing string to function, Passing array to function, Function returning address, Recursion, Structures & Union, Pointer to Structure, Self-Referential Structures, Dynamic memory allocation by malloc/calloc function, Storage Classes.

Unit V

File Handling: Defining and Opening a file, Closing Files, Input/output Operations on Files, Predefined Streams, Error Handling during I/O Operations, Command Line Arguments.

RECOMMENDED BOOKS

- Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
- Paul Deitel and Harvey M. Deitel , How to Program, Pearson Publication.
- Yashavant Kanetkar , Let Us C, BPB publication.
- E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill.
- Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.

COURSE OUTCOMES

After completion of the course students would be able to:

CO1: identify situations where computational methods and computers would be useful.

CO2: describe the basic principles of imperative and structural programming.

CO3: develop a pseudo-code and flowchart for a given problem.

CO4: analyze the problems and choose suitable programming techniques to develop solutions.

CO5: design, implement, debug and test programs.

CO6: design computer programs to solve real world problems.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Syllabi
(II Semester)
of the
B. Tech. Programme
(Computer Science & Engineering)
Under Flexible Curriculum

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Department of Computer Science & Engineering
DATA STRUCTURES
150211 (DC-1)

COURSE OBJECTIVES

- To be familiar with the use of data structures as the foundational base for computer solutions to problems.
- To understand various techniques of searching and sorting.
- To understand basic concepts about stacks, queues, lists, trees and graphs.

Unit-I

Introduction to Data Structures: Algorithms & their characteristics, asymptotic notations, arrays and its representations, index to address translation. **Link list:** Introduction, implementation of linked list, operations, circular link list, doubly linked list, polynomial manipulation using linked list.

Unit-II

Stacks: Concepts and implementation of stacks, operations on stack, conversion of infix to postfix notation, evaluation of postfix expression, recursion.

Queues: Concepts and implementation, operations on queues, dequeue, priority queues, circular queues and application.

Unit-III

Trees: Types, terminology, binary tree -representations, traversal, conversion of general tree to binary tree, binary search tree, threaded binary tree and height balanced tree.

Unit-IV

Searching & Sorting: Linear search, binary search, bubble sort, selection sort, insertion sort, quick sort, merge sort, radix sort and heap sort, comparison between sorting techniques, hashing and collision resolution techniques.

Unit-V

    Graphs: Background, graph theory terminologies, representation of graphs- sequential & linked representation, path matrix, graph traversals- BFS, DFS, spanning trees, applications of graph.

RECOMMENDED BOOKS

- Data Structures, Algorithms and Applications in C++, Sartaj Sahni, 2nd Edition.
- An Introduction to Data Structures with Applications, Jean-Paul Tremblay, Mcgraw hill.
- Data Structures & Algorithms, Aho, Hopcroft & Ullman, original edition, Pearson Publication.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. outline the basics of Algorithms and their performance criteria's.

CO2. explain the working of linear/Non Linear data structures.

CO3. identify the appropriate data structure to solve specific problems.

CO4. analyze the performance of various Data Structures & their applications.

CO5. evaluate the time/space complexities of various data structures & their applications.

CO6. design the optimal algorithmic solutions for various problems.

Department of Computer Science & Engineering
OBJECT ORIENTED PROGRAMMING AND METHODOLOGY
150212 (DC-2)

COURSE OBJECTIVES

- To study about the concept of object oriented programming.

- To create C++ programs that leverage the object oriented features of the C++ Language.

- To apply object oriented or non-object oriented techniques to solve bigger computing problems.

Unit-I

Introduction to C++ and Object Oriented Concepts: Basics of C++, Tokens, I/O Statements, Structure of Program, Operators and Expressions, Flow of Control, Arrays, Structures, Functions and its type, Function Prototyping, Pointers, Pointer Variables, Pointers and Arrays, Array of Pointers, Pointers and Structures, Dynamic Memory Allocation.

Programming Techniques: Unstructured & Structured Programming, Object Oriented Paradigm, Features of Oops, Comparison with Procedural Oriented Programming & Object Oriented Programming, Abstract Data Types, Reference Variable, Scope Resolution Operator.

Unit-II

Classes & Objects: Specification of Class, Visibility Modes: Private, Public, Protected, Defining Member Functions, Creating of Objects, Characteristics of Object, Static Data Member, Static Member Function, Array of Objects, Object as Arguments, Inline Function, Default Arguments, Friend Function, Recursion.

Constructors and Destructors: Introduction, Types of Constructors- DefaultConstructor, User Defined Constructor, Parameterized Constructor, Copy Constructor, Constructor with Default Arguments, Rules of Constructor Definition and Usage, Destructors.

Unit-III

Polymorphism: Introduction, Type of Polymorphism: Compile Time Polymorphism & Run Time Polymorphism, Function Overloading, Operator Overloading: Binary

Operators, Arithmetic Assignment Operators, Unary Operators, Rules for Operator Overloading, Pitfalls of Operator Overloading, Data Conversion, Type Casting.

Unit-IV

Inheritance: Introduction to Code Reuse, Visibility Modes, Types of Inheritance: Single Level, Multilevel, Multiple, Hybrid, Multipath. Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Nesting of Classes, Overriding Member Function. Containership: Classes with in Classes, Function Overriding.

Unit-V

Pointer & File Concept: Pointers Overview, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions & Pure Virtual Function. Association, Type of Association, Aggregation, File Concepts, Study of Various Files and Streams, Opening and Closing of Files- Functions Get(), Getline(), Put(), Opening The Files Using Function Open(), File Manipulator Function.

RECOMMENDED BOOKS

- C++ How to Program, H M Deitel and P J Deitel, Prentice Hall.
- Programming with C++, D Ravichandran, T.M.H.
- Computing Concepts with C++ Essentials, Horstmann, John Wiley.
- The Complete Reference in C++, Herbert Schildt, TMH.
- Object-Oriented Programming in C++, E Balagurusam.
- Fundamentals of Programming C++, Richard L. Halterman.

COURSE OUTCOMES

After completion of this course, the students would be able to:

CO1. tell the concepts of classes & objects and their significance in real world.

CO2. explain the benefits of object oriented design.

CO3. build C++ classes using appropriate encapsulation and design principles.

CO4. analyze the utilization of inheritance and polymorphism in the solution of problems.

CO5. choose appropriate object orient programming concepts for solving real world problems.

CO6. develop solutions to problems demonstrating usage of control structures, modularity, I/O and other standard language constructs.

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Department of Computer Science & Engineering
DIGITAL ELECTRONICS
150213 (DC-3)

COURSE OBJECTIVES

- To perform the analysis and design of various digital electronic circuits.
- To learn various number systems, boolean algebra and logic gates.
- To understand the concept of counters, latches and flip-flops.

Unit-I

Introduction to Digital Electronics, Needs and Significance, Different Number System: Binary Numbers, Octal and Hexadecimal Numbers, Conversions, Complement's, Signed Binary Numbers, Binary Arithmetic's, Binary Codes: BCD, ASCII Codes.

Unit-II

Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Boolean Relations, Digital Logic Gates, De Morgan's Theorem, Karnaugh Maps and simplifications.

Unit-III

Combinational Circuits, Half Adder, Full Adder, Binary Adder-Subtractor, Binary Multiplier, Comparator, Decoders, Encoders, Multiplexers.

Unit-IV

Sequential Circuits, Latches, Flip-Flops: RS Latches, Level Clocking, D Latches, Edge-triggered D Flip-flop, Edge-triggered JK Flip-flop, JK Master-slave Flip-flop; Registers, Shift Registers, Counters, Ripple Counters, Synchronous Counters.

Unit-V

Introduction to Memory, Memory Decoding, Error Detection and Correction, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices, RTL and DTL Circuits, TTL, ECL, MOS, CMOS, Application Specific Integrated Circuits.

RECOMMENDED BOOKS

- Digital Design,Morris Mano M. and Michael D. Ciletti, IV Edition, Pearson Education.
- Digital Electronics: Principles, Devices and Applications,Anil K. Maini, Wiley.

COURSE OUTCOMES

After completion of the course students would be able to:

CO1. explain the computer architecture for defining basic component and functional unit.

CO2. recall different number system and solve the basic arithmetic operations.

CO3. develop the understanding of combinational circuits.

CO4. analyze the basic concept of sequential circuits.

CO5. compare various memories.

CO6. solve the boolean functions using logic gates.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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After modification annexure-12

Scheme of Examination
B.Tech. I Semester (Computer Science and Engineering)

For batches admitted in Academic Session 2020-21 Onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per Week					
				Theory Slot				Practical Slot				L	T	P		Mode of Teaching Offline/Online/Blended	Mode of Exam
				End Sem.		Mid Sem.	Quiz/ Assignment	End Sem.	Lab work / Sessional	Skill Base mini Project							
				End Term Evaluation	Proficiency in subject /course												
1.	230182	DC	Introduction to Computer Programming	50	10	20	20	60	20	20	200	2	1	2		Blended (2H)	A+O
2.	100022	ESC	Basic Electrical & Electronics Engineering	50	10	20	20	60	20	20	200	2	1	2		Blended (2H)	MCQ
3.	100020	ESC	Basic Civil Engineering & Mechanics	50	10	20	20	.	.	.	100	2	1	-		Blended (2H)	PP
4.	100021	ESC	Basic Mechanical Engineering	50	10	20	20	-	-	-	100	2	1	-		Blended (2H)	MCQ
5.	100015	HSMC	Energy, Environment, Ecology & Society	50	10	20	20	-	-	.	100	3	-	-		Online (03)	MCQ
6.	150111	DLC	IT workshop	-	-	-	-	60	20	20	100	-	-	4		Offline	SO
			Total	250	50	100	100	180	60	60	800	11	04	08			

Induction Programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.

NSS / NCC	Qualifier

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

Proficiency in course/subject – includes the weightage towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject

Mode of Teaching					Mode of Examination				Total Credits
Theory				Lab	Theory			Lab	
Offline	Online	Blended		Offline	PP	A+O	MCQ	SO	
		Offline	Online						
0	3	8	4	4	3	4	10	2	19
0	15.78	42.10	21.05	21.05	15.8	21.0	52.6	10.5	Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)<u>Annexure-14</u>

Scheme of Examination

B.Tech. II Semester (Computer Science and Engineering)

For batches admitted in Academic Session 2020-21 Onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per Week			Total Credits	Mode of Exam	Mode of Teaching (Offline/Online)
				Theory Slot				Practical Slot				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem.	Continuous Evaluation								
				End Term Evaluation	$^\$$Proficiency in subject /course	Mid Sem.	Quiz/Assign ment		Lab work / Sessional	Skill Based mini Project							
1.	100011	BSC	Engineering Mathematics –I	50	10	20	20	-	-	-	100	3	1	-	4	PP	Offline
2.	150211	DC	Data Structures	50	10	20	20	60	40	20	200	2	1	2	4	PP	Blended (2)
3.	150212	DC	Object Oriented Programming & Methodology	50	10	20	20	60	20	20	200	3	-	2	4	A+O	Blended (2)
4.	150213	DC	Digital Electronics	50	10	20	20	-	-	-	100	2	1		3	PP	Blended (2-1)
5.	100016	HSMC	Technical Language	50	10	20	20	-	-	-	100	3	-	-	3	PP	Blended (2-1)
6.	100017	HSMC	Language Lab	-	-	-	-	60	20	20	100	-	-	2	1	SO	Offline
			Total	250	50	100	100	180	80	60	800	13	03	06	19		
			Summer Internship Project – I (Institute Level) (Qualifier): Minimum two-week duration: Evaluation in III Semester.														
	NSS / NCC			Qualifier													

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

`Proficiency in course/subject – includes the weightage towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject

Mode of Teaching					Mode of Examination				Total Credits
Theory				Lab	Theory			Lab	
Offline	Online	Blended		Offline	PP	A+O	MCQ	SO	
		Offline	Online						
4	-	8	4	3	14	4	-	1	19
21.0	-	42.10	21.0	15.78	73.68	21.0	-	5.26	Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of CSE

Sample Guidelines for IT Workshop

DLC-150111

1. Blog Writing: Example -you need to write a blog post presenting study on existing start ups/your start-up idea and how you want to design, implement and launch". The blog should explain your business idea for a start-up company or product (of any Engineering discipline). Idea should be unique, feasible to be developed and implemented and the implementation should be based on computational solution (using software and/or Hardware) . The blog should contain min 1200 words.

2. A mini project in the programming language (in the curriculum) of your choice.

This is a sample/suggestive list which is dynamic and expandable

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Department of CSE
Data Structure using C/C++ Lab (150211)

Write C/C++ Programs to illustrate the concept of the following:

1. Implementation of Array and linked list.

2. Implementation of Sorting Algorithms-Non-Recursive and Recursive.

3. Implementation of Searching Algorithms-Linear and Binary Search.

4. Implementation of Stack using Array.

5. Implementation of Queue using Array.

6. Implementation of Circular Queue using Array.

7. Implementation of Stack using Linked List.

8. Implementation of Queue using Linked List.

9. Implementation of Circular Queue using Linked List.

10. Implementation of Tree Structures, Binary Tree, Tree Traversal, Binary Search Tree, Insertion and Deletion in BST.

11. Graph Implementation, BFS, DFS, Minimum cost spanning tree, shortest path algorithm.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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Department of CSE
Data Structure skill-based project list (150211)

1. Develop an application to calculate the address of given index position of 2D,3D,4D and nD array elements.
2. Develop an utility to store polynomial equations and to add two polynomial equations.
3. Design the solution of Tower of Hanoi mathematical puzzle where we have three rods and n disks. The objective of the puzzle is to move the entire stack to another rod, obeying the following simple rules:
   a) Only one disk can be moved at a time.
   b) Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack i.e. a disk can only be moved if it is the uppermost disk on a stack.
   c) No disk may be placed on top of a smaller disk. Develop an application to generate preoder, postorder and inorder traversing sequences of given binary tree.
4. Design a Palindrome-Checker algorithm and implement the utility for Palindrome checking. A palindrome is a string that reads the same forward and backward, for example, radar, toot, and madam.
5. Design a solution of the Word Ladder Problem and develop a software. Example - Transform the word "FOOL" into the word "SAGE". In a word ladder puzzle, you must make the change occur gradually by changing one letter at a time. At each step you must transform one word into another word, you are not allowed to transform a word into a non-word.
6. Develop an application to solve Single-Source Shortest Path (SSSP) problem All-Pairs Shortest Path (APSP).
7. Find out Longest Increasing Subsequence in the given elements. The Longest Increasing Subsequence (LIS) problem is to find the length of the longest subsequence of a given sequence such that all elements of the subsequence are sorted in increasing order. For example, the length of LIS for {10, 22, 9, 33, 21, 50, 41, 60, 80} is 6 and LIS is {10, 22, 33, 50, 60, 80}.

Please Note: Each project has to be submitted by a group of 3 to 4 students, and each group will be assigned only one project.

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of CSE
OOP and Methodology (150212)

LIST OF PROGRAMS

1. Write a program to swap two integers without using third variable. The swapping must be done in a function of a particular class.

2. Write a program that uses a class where the member functions are defined outside a class.

3. Design a class to represent a bank account. Which includes account number, name of the depositor, type of the account, balance amount in the account. Define Methods, to assign initial values, to Deposit an amount, to Withdraw amount after checking balance, to display name and balance.

4. Write a program to find the greater of two given numbers in two different classes using friend function.

5. Create an inheritance hierarchy of Rodent, Mouse, Gerbil, Hamster etc. In the base class provide methods that are common to all Rodents and override these in the derived classes to perform different behaviors, depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents and call your base class methods.

6. Create two classes: Polar and Cartesian, to represent Polar and Cartesian coordinates of a point. Demonstrate how to convert Polar coordinates to Cartesian coordinates by writing the conversion code in source class.

7. Write a program to demonstrate anomaly caused in Multi-path Inheritance. Also, write a program to overcome the anomaly.

8. Create an abstract class Shape which has a field P1=3.14 as final and it has an abstract method Volume. Make two sub-classes 'Cone' and 'Sphere' from this class and they should print their volume.

9. Create a class called LIST with two pure virtual function store() and retrieve().To store a value call store and to retrieve call retrieve function. Derive two classes stack and queue from it and override store and retrieve.

10 Write a program to demonstrate working of various file handling operations in C++.

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