MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

CSE/Ref.No/6589dH·17/6/22

Board of Studies(BoS) Proceeding in Computer Science and Engineering (Meeting Dated- 22 December 2021)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

BOS Summary

Courses where revision was carried out*							
(Course/subject name)	Course Code	Year/Date of introduction	Year/Date of revision	Percentage of content added or replaced	Agenda Item No.	Page No.	Link of relevant documents/minutes
Digital Electronics	150213		2021. Dec	5%	18		Old_Annexure-XXVI New_Annexure-XXVII Lecture Plan New(AnnexureXVIII)

Courses focusing on employability/entrepreneurship/ skill development					
(Course/subject name)	Course Code	Activities/contents which have a bearing on increasing skill and employability	Agenda Item No.	Page No.	Link of relevant documents/minutes
Ethical Hacking		Course is beneficial for individuals and organizations to adopt safe practices and usage of their IT infrastructure. Course will cover networking, network security and cryptography, various attacks and vulnerabilities and ways to secure them. There will be hands-on demonstrations that will be helpful to the students.	2	2	
Hardware Security		Course will focus on the importance of addressing different security threats on modern hardware design, manufacturing, installation, and operating practices. In particular, the threats would be shown to be relevant at scales ranging from a single user to an entire nation's public infrastructure. Through theoretical analyses and relevant practical world case studies, the threats would be demonstrated, and then state-of-the-art defence techniques would be described. The course would borrow concepts from diverse fields of study such as cryptography, hardware design, circuit testing, algorithms, and machine learning.	2	2	
Blockchain and its applications		Course will cover the basic design principles of Blockchain technology and its applications over different sectors. Additionally, the course also provides tutorials on setting up	2	2	

		blockchain applications using one of the well-adopted permissionless blockchain platforms - Ethereum, and one permissioned blockchain platform - Hyperledger.			
Online Privacy		Course will cover the privacy issues of various popular social platforms such as, Facebook, Twitter, Koo, Tinder e-commerce (Amazon, Flipkart), gaming (Roblox), video streaming (Netflix, Amazon Prime, Twitch), and messaging (WhatsApp, Signal, Telegram) services. In this course online Privacy to be investigated, studied and characterized from various perspectives (computational, cultural, psychological, theoretical, etc.).	5	4	
Cloud Computing and Distributed Systems		The cloud computing and distributed systems concepts and models covered in course includes: virtualization, cloud storage: key-value/NoSQL stores, cloud networking,fault-tolerance cloud using PAXOS, peer-to-peer systems, classical distributed algorithms such as leader election, time, ordering in distributed systems, distributed mutual exclusion, distributed algorithms for failures and recovery approaches, emerging areas of big data and many more. And while discussing the concepts and techniques, Course will also look at aspects of industry systems such as Apache Spark, Google's Chubby, Apache Zookeeper, HBase, MapReduce, Apache Cassandra, Google's B4, Microsoft's Swan and many others. Upon completing this course, students will have intimate knowledge about the internals of cloud computing and how the distributed systems concepts work inside clouds.	5	4	
Introduction to parallel programming with OpenMP and MPI		This course focuses on the shared memory programming paradigm. It covers concepts & programming principles involved in developing			

		scalable parallel applications. Assignments focus on writing scalable programs for multi-core architectures using OpenMP and C. This is an introductory course in shared memory parallel programming suitable for computer science as well as non-computer science students working on parallel/HPC applications and interested in parallel programming.			
Introduction to Internet of Things		This course will cover different application domain verticals ranging from civilian to defence sectors. These domains include agriculture, space, healthcare, manufacturing, construction, water, and mining, which are presently transitioning their legacy infrastructure to support IoT.	3	3	
Advanced Computer Architecture		This course provides a deeper insight into the design of high-end microprocessors that will support the future applications.	5	4	
Information Security - 5 - Secure Systems Engineering		This course will discuss various vulnerabilities in systems and mechanisms by which these vulnerabilities can be mitigated. The first part of the course will discuss various security vulnerabilities in software code that, if left unfixed, can potentially lead to major cyber-attacks. Course will cover some recent cyber-attacks such as Meltdown and Spectre, Heartbleed, and Stagefright.	5	4	
Foundations of Cryptography		The course provides the basic paradigm and principles of modern cryptography. The focus of this course will be on definitions and constructions of various cryptographic objects. We will try to understand what security properties are desirable in such objects, how to formally define these properties, and how to design objects that satisfy the definitions. The aim is that at the end of this course, the students are able to understand a significant portion of current cryptography	5	4	

		research papers and standards.			
Introduction to Machine Learning		This course introduces some of the basic concepts of machine learning from a mathematically well motivated perspective. It will cover the different learning paradigms and some of the more popular algorithms and architectures used in each of these paradigms.	5	4	
Data Science for Engineers		This course introduces the variety of concepts in the field of artificial intelligence. It discusses the philosophy of AI, and how to model a new problem as an AI problem. It describes a variety of models such as search, logic, Bayes nets, and MDPs, which can be used to model a new problem. The course prepares a student to take a variety of focused, advanced courses in various subfields of AI.	5	4	
GPU Architectures and Programming		The course covers basics of conventional CPU architectures, their extensions for single instruction multiple data processing (SIMD) and finally the generalization of this concept in the form of single instruction multiple thread processing (SIMT) as is done in modern GPUs. It will also cover GPU architecture basics in terms of functional units and then dive into the popular CUDA programming model commonly used for GPU programming.	5	4	
Programming In Java		This course aims to cover the essential topics of Java programming so that the participants can improve their skills to cope with the current demand of IT industries and solve many problems in their own filed of studies.	5	4	
Database Management System		The course examines data structures, file organizations, concepts and principles of DBMS's, data analysis, database design, data modeling, database management, data & query optimization, and database implementation. More specifically, the course introduces relational data	5	4	

		models; entity-relationship modeling, SQL, data normalization, and database design. Further it introduces query coding practices using MySQL (or any other open system) through various assignments. Design of simple multi-tier client / server architectures based and Web-based database applications is also introduced.			
Compiler Design		This course on compiler design is to address all these issues, starting from the theoretical foundations to the architectural issues to automated tools. Being primarily targeted to a one-semester course for the undergraduate students.	5	4	
Computer Networks and Internet Protocol		The broad objective of the course is to understand - (i) the architecture and principles of today's computer networks, (ii) the protocols and their functionalities, (iii) the requirements for the future Internet and its impact on the computer network architecture. In this course, we'll broadly cover the basic TCP/IP protocol stack and touch on the next generation computer networks.	5	4	
Network & Web Security	150611	This course will give an understanding of the principles of systems security from application viewpoint. Student will obtain hands-on experience on security threats and counter-measures. Goal is to study various types of threats, operating systems security, advanced topics on network security, web security and usable security. After the completion of the course, the student will have understanding of practical aspects of security and will be able to analyze and design the secure systems.	7	5	
Image Processing	150612	The intent of this course is to familiarize the students to explain the fundamental concepts/issues of Computer Vision and Image Processing, and major approaches that address them. This course	7	5	

		provides an introduction to computer vision including image acquisition and image formation models, radiometric models of image formation, image formation in the camera, image processing concepts, concept of feature extraction and selection for pattern classification/recognition, and advanced concepts like motion estimation and tracking, image classification, scene understanding, object classification and tracking, image fusion, and image registration, etc.			
Mobile Computing	150613	This course will cover integration of mobile applications with cloud services to create mobile- cloud applications.	7	5	
An Introduction to Artificial Intelligence	150654	The course introduces the variety of concepts in the field of artificial intelligence. It discusses the philosophy of AI, and how to model a new problem as an AI problem. It describes a variety of models such as search, logic, Bayes nets, and MDPs, which can be used to model a new problem. It also teaches many first algorithms to solve each formulation. The course prepares a student to take a variety of focused, advanced courses in various subfields of AI.	8	5	
Data Structures	900106	The course will cover approaches for efficient storage mechanisms of data for easy access.design and implementation of various basic and advanced data structures.	9	6	
Python Programming	900107	This course is designed for use by freshmen students taking their first course in programming. It deals with the techniques needed to practice computational thinking, the art of using computers to solve problems and the ways the computers can be used to solve problems.	9	6	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

New Courses added					
(Course/subject name)	Course Code	Activities/contents which have a bearing on increasing skill and employability	Agenda Item No.	Page No.	Link of relevant documents/minutes
Ethical Hacking		Course is beneficial for individuals and organizations to adopt safe practices and usage of their IT infrastructure. Course will cover networking, network security and cryptography, various attacks and vulnerabilities and ways to secure them. There will be hands-on demonstrations that will be helpful to the students.	2	2	
Hardware Security		Course will focus on the importance of addressing different security threats on modern hardware design, manufacturing, installation, and operating practices. In particular, the threats would be shown to be relevant at scales ranging from a single user to an entire nation's public infrastructure. Through theoretical analyses and relevant practical world case studies, the threats would be demonstrated, and then state-of-the-art defence techniques would be described. The course would borrow concepts from diverse fields of study such as cryptography, hardware design, circuit testing, algorithms, and machine learning.	2	2	
Blockchain and its applications		Course will cover the basic design principles of Blockchain technology and its applications over different sectors. Additionally, the course also provides tutorials on setting up blockchain applications using one of the well-adopted permissionless blockchain platforms - Ethereum, and one permissioned blockchain platform - Hyperledger.	2	2	
Online Privacy		Course will cover the privacy issues of various popular social platforms such as, Facebook, Twitter, Koo, Tinder e-	2	2	

		commerce (Amazon, Flipkart), gaming (Roblox), video streaming (Netflix, Amazon Prime, Twitch), and messaging (WhatsApp, Signal, Telegram) services. In this course online Privacy to be investigated, studied and characterized from various perspectives (computational, cultural, psychological, theoretical, etc.).			
Cloud Computing and Distributed Systems		The cloud computing and distributed systems concepts and models covered in course includes: virtualization, cloud storage: key-value/NoSQL stores, cloud networking,fault-tolerance cloud using PAXOS, peer-to-peer systems, classical distributed algorithms such as leader election, time, ordering in distributed systems, distributed mutual exclusion, distributed algorithms for failures and recovery approaches, emerging areas of big data and many more. And while discussing the concepts and techniques, Course will also look at aspects of industry systems such as Apache Spark, Google's Chubby, Apache Zookeeper, HBase, MapReduce, Apache Cassandra, Google's B4, Microsoft's Swan and many others. Upon completing this course, students will have intimate knowledge about the internals of cloud computing and how the distributed systems concepts work inside clouds.	5	4	
Introduction to parallel programming with OpenMP and MPI		This course focuses on the shared memory programming paradigm. It covers concepts & programming principles involved in developing scalable parallel applications. Assignments focus on writing scalable programs for multi-core architectures using OpenMP and C. This is an introductory course in shared memory parallel programming suitable for computer science as well as non-computer science students working on parallel/HPC applications and interested in parallel programming.	5	4	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Feedback on curriculum received from stakeholders: Analysis & ATR*

Stakeholder	Student	Faculty	Alumni	Employer
No. of responses	113	15	35	62
Link of Analysis	Annexure-XXI	Annexure-XXI	Annexure-XXI	Annexure-XXI
ATR Link	Annexure-XXIV	Annexure-XXIV	Annexure-XXIV	Annexure-XXIV
Link showing Excel sheet of Google Form details of stakeholders	Annexure-XXV	Annexure-XXV	Annexure-XXV	Collected through the office of Training & Placement

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Agenda of the BoS

(Approved by the Academic Development Cell for all BoS Meetings Scheduled during December2021)

The Meeting of Board of Studies (BoS) in Computer Science and Engineering was held on 22nd December 2021 (02:00 P.M. onwards) **through video conferencing**. During the meeting following were present.

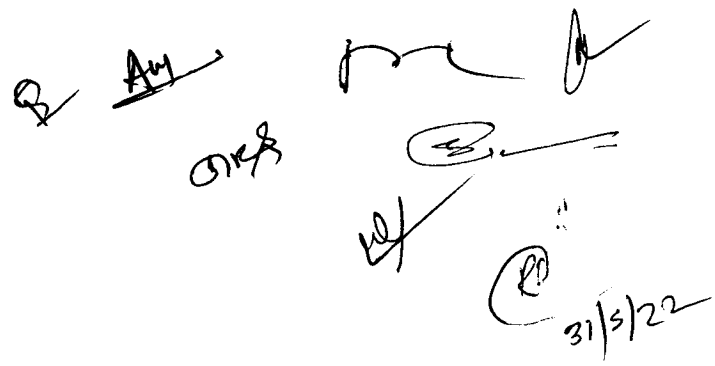
1.	Dr. Manish Dixit, Professor & Head Department of Computer Science and Engineering Madhav Institute of Technology and Science, Gwalior	**Chairman**
2.	Dr. A. K. Solanki, Professor (Computer Science & Engineering), B.I.E.T. Jhansi (U.P.)	External Member (Academics) ***(Nominee of Hon'ble Vice Chancellor 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. Dinesh Kumar Vishwakarma, Associate Professor, Dept of IT, DTU, Delhi	External Member (Academics) (Nominated by DTU Delhi under Twinning arrangement of TEQIP-III)
6.	Mr. Ashish Khare, Senior Software Engineer, Qualys Inc(US based security solutions provider)	External Member (Alumnus)
7.	Dr. Nisha Chaurasia, Assistant Professor, Department of IT, Dr. B. R. Ambedkar National Institute of Technology (NIT) Jalandhar	External Member (Alumnus)
8.	Dr. R. K. Gupta, Professor	Member
9.	Ms. Khushboo Agarwal, Assistant Professor	Member
10.	Ms. Jaimala Jha, Assistant Professor	Member
11.	Mr. Mahesh Parmar, Assistant Professor	Member
12.	Dr. R. R. Singh Makwana, Assistant Professor	Member
13.	Mr. Amit Kumar Manjhvar, Assistant Professor	Member
14.	Dr. Anjula Mehto, Assistant Professor	Member
15.	Dr. Kalka Dubey, Assistant Professor	Member
16.	Dr. Ranjeet Kumar Singh, Assistant Professor	Member
17.	Dr. R. S. Jadon, Professor (Computer Application)	Member
18.	Dr. Anshu Chaturvedi, Professor (Computer Application)	Member
19.	Dr. Parul Saxena, Assistant Professor (Computer Application)	Member

In addition to above, students' members were also present.

1.	Mr. Himalaya Gupta	Student Member
2.	Mr. Sahaj Jain	Student Member

The following external members could not attend the meeting.

1.	Mr. Amitabh Shrivastava, Senior Consultant, TCS Noida	External Member (Industry)
2.	Dr. Sandeep Sharma, Managing Director, Deloitte, Hyderabad	External Member (Industry)
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)



1. *Minutes of the last BoS held on 7 June2021 are confirmed by the house.*

2. *Following are the points which are discussed as per the agenda in the BoS on 22 December 2021.*

BoS Agenda Items

Item 1

To propose the ***scheme structure of VIII Semester*** *with the provision of Two Departmental Electives and one Open Category (OC)Course,* ***to be offered in online mode*** *with credit transfer for the batch admitted in* 2018-19

New Scheme as per agenda item no-1 were discussed and finalized; Scheme is attached in annexure-I. Link

Item 2

To propose the list of courses which the students can opt from SWAYAM/NPTEL/ other MOOC Platforms/ Institution (MITS) MOOC, to be offered in ***online mode under Departmental Elective (DE) category,*** for credit transfer in the ***VIII Semester*** under the flexible curriculum (*Batch admitted in 2018-19)*

The list of Departmental Elective (DE-5 and DE-6) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VIII Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.

Course ID	Departmental Elective (DE-5)	Course Code
noc22-cs30	Social Network	150851
noc22-cs13	Ethical Hacking	150854
noc22-cs48	Hardware Security	150855

Course ID	Departmental Elective (DE-6)	Course Code
noc22-cs44	Blockchain and its Applications	150856
noc22-cs37	Online Privacy	150857
noc22-cs34	Reinforcement Learning	150853

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).

Item 3

To propose the list of courses which the students can opt from SWAYAM/NPTEL/MOOC Platform, to be offered in ***online mode from*** SWAYAM/NPTEL/MITS MOOCs/ other MOOC Platforms) ***under Open Category (OC)*** Courses, for credit transfer in the ***VIII Semester under*** the flexible curriculum (*Batch admitted in 2018-19)*

The list of Open Category Course (OC-4) to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VIII Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.

Course ID	Open Category Course (OC-4)	Course Code
noc22-cs13	Ethical Hacking	900627
noc22-cs53	Introduction to Internet of Things	900619
noc22-cs37	Online Privacy	900628

In continuation, it is also discussed and recommended that the above-mentioned list of **Open Category Course (OC-4)** ***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).***

Item 4

To propose the course and syllabi of MITS*MOOC* Course along with the Course Outcomes for credit transfer in the *VIII Semester* under the flexible curriculum *(Batch admitted in 2018-19)*

Internet of Things: An Overview (MITS MOOC) Open category (OC-4) course is to be offered from MITS MOOC based learning platform (in online mode) for B.Tech VIII Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail. The MOOC is developing and will be floated after the completion for opting to students.

Syllabus is attached in Annexure-II

Item 5

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

(i) ***Honours (for students of the host department)***

(ii) ***Minor Specialization (for students of other departments)***

*[These will be offered through SWAYAM/NPTEL/MOOC based Platforms for the **VI semester** (for the batch admitted in 2019-20) and for **VIII 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 *"Honours" VIII Semester***

Course ID	Courses
noc22-cs10	Advanced Computer Architecture
noc22-cs23	Information Security - 5 - Secure Systems Engineering
noc22-cs03	Foundations of Cryptography

2) **Courses for *"Minors" VIII Semester***

Course ID	Courses
noc22-cs18	Cloud Computing and Distributed Systems
noc22-cs29	Introduction to Machine Learning
noc22-cs28	Data Science for Engineers

3) **Courses for *"Honours" VI Semester***

Course ID	Courses
noc22-cs09	GPU Architectures and Programming
noc22-cs21	Introduction to parallel programming with OpenMP and MPI
noc22-cs28	Data Science for Engineers

4) **Courses for *"Minors " VI Semester***

Course ID	Courses	Domain Specialization
noc22-cs47	Programming In Java	Programming
noc22-cs51	Database Management System	Programming
noc22-cs13	Ethical Hacking	Systems
noc22-cs19	Computer Networks and Internet Protocol	Systems

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

Item 6

To review and finalize the syllabi for all ***Departmental Core (DC) Courses*** of ***VI Semester (for batches admitted in 2019-20)*** under the flexible curriculum along with their Cos.

The Syllabi of all the Departmental Core (DC) Courses, to be offered during VI Semester (B.Tech CSE Programme) along with their Cos under flexible curriculum were discussed and recommended.

Departmental Core (DC) Courses
Compiler Design (DC-12) -150601
Computer Networks (DC- 13)- 150602

The Scheme is attached in Annexure-III and Syllabus of DC courses are attached in Annexure-IV. The links are given below in soft copy.

Scheme VI sem old

Scheme VI Sem New in annexure III

Syllabus DC VI Sem

Item 7

To review and finalize the courses & syllabi to be offered ***(for batches admitted in 2019-20)***under ***Departmental Elective (DE) Courses*** in the ***VI Semester***

The list of Departmental Elective (DE-1) courses for B.Tech VI Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.

Departmental Elective (DE-1) courses	Course Code
Network & Web Security	150611
Image Processing	150612
Mobile Computing	150613

Syllabus DE-1 VI Sem is enclosed in Annexure-IV

Item 8

To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered ***(for batches admitted in 2019-20)*** in online mode under ***Departmental Elective (DE) Courses*** with credit transfer, in the ***VI Semester***

The list of Departmental Elective (DE-2) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VI Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.

Course ID	Courses	Course Code
noc22-cs56	An Introduction to Artificial Intelligence	150654
noc22-cs53	Introduction To Internet of Things	150656
noc22-cs55	Object Oriented System Development Using UML, Java And Patterns	150657

Item 9

To review and finalize the courses & syllabi to be offered ***(for batches admitted in 2019-20)*** under the ***Open Category (OC) Courses***(in traditional mode) for ***VI semester*** students of other departments along with their Cos

The list of Departmental Elective (OC-1) courses for B.Tech VI Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.

OC-1 Course	Course Code
Data Structures	900106
Python Programming	900107

	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** OC VI Sem as Annexure-V
Item 10	To review and finalize the Experiment list/ Lab manual for Laboratory Courses to be offered in VI semester ***(for batches admitted in 2019-20)*** Experiment List VI Sem as Annexure-VI
Item 11	To review and finalize the scheme and syllabi of **B. Tech.** ***IV Semester (for batches admitted in 2020-21)*** under the flexible curriculum along with their COs Scheme and syllabus has already been finalised in Last BOS conducted on 7th June 2021 is again reviewed and passes the same. Scheme IV Sem as Annexure-VII Syllabi IV Sem as Annexure-VIII
Item 12	To review and finalize the Experiment list/ Lab manual for Laboratory Courses to be offered in IV***(for batch admitted in 2020-21)*** The Experiment list/ Lab manual for Laboratory Courses to be offered in IV ***(for batch admitted in 2020-21)is*** reviewed and finalized and list is enclosed in Annexure-IX Experiment List IV Sem
Item 13	To review and finalize the suggestive list of projects which can be assigned under the 'Skill based mini-project' category in various laboratory courses to be offered in Jan - June 2022 semester during IV Semester ***(for the batch admitted in 2020-21)***. list of projects which can be assigned under the 'Skill based mini-project' category in various laboratory courses to be offered in Jan - June 2022 semester during IV Semester is reviewed as it was passed in BOS conducted on 07 June 2021 and some more are suggested as additional list of Skill based mini projects as per Annexure-X
Item 14	To ratify the ***Scheme & Syllabi, list of experiments and skill based mini projects of First semester* of the newly started B. Tech. programmes in the emerging areas (AI & ML, AI & DS, CSD) (started from 2021-22 Session)** *{Applicable for the concerned departments}* ***Scheme & Syllabi, list of experiments and skill based mini projects of First semester* of the newly started B. Tech. programmes in the emerging areas CSD (started from 2021-22 Session) is proposed and passed** Scheme CSD First Semester as Annexure-XI Syllabus CSD First Semester as Annexure-XII
Item 15	To ratify the ***Scheme & Syllabi, list of experiments and skill based mini projects of First Semester* B. Tech. programmes [admitted batch 2021-22 Session] (if any)** **The** ***Syllabi, list of experiments and skill based mini projects of First Semester* B. Tech. CSE Program for IT workshop is reviewed and proposed in Annexure-XIII** *IT Workshop*
Item 16	To prepare and recommend the ***Scheme & Syllabi (along with the Course Outcomes) of II semester* of the newly started B. Tech. programmes in the emerging areas (AI & ML, AI & DS, CSD) (started from 2021-22 Session)** *{Applicable for the concerned departments}* ***Scheme & Syllabi (along with the Course Outcomes) of II semester* of the newly started B. Tech. programmes in the emerging areas CSD (started from 2021-22 Session) is Proposed and finalised as per Annexure-XIV(Scheme) and Annexure-XV(Syllabus)** Annexure-XIV *Scheme*, **Annexure-XV** Syllabi
Item 17	To prepare and recommend the list of experiments and skill based mini projects of ***II semester* of the newly started B. Tech. programmes in the emerging areas (AI & ML, AI & DS, CSD) (started from 2021-22 Session)** *{Applicable for the concerned departments}* The list of experiments and skill based mini projects of ***II semester* of the newly started B. Tech. programmes in the emerging areas CSD (started from 2021-22 Session) is** recommended

	And enclosed in **Annexure-XVI.** *Experiment and skill based mini project*
Item 18	To review and finalize the ***Scheme & Syllabi (along with the Course Outcomes) of II semester*** **B. Tech. programmes (batch admitted 2021-22 Session)** *Scheme & Syllabi (along with the Course Outcomes) of II semester* B. Tech. programmes (batch admitted 2021-22 Session is proposed as same which were earlier approved for admitted batch 2020-21 for CSE Program and enclosed in **Annexure- XVII(Scheme) and** Annexure- XVIII(Syllabus) Annexure- XVII ***Scheme*** Annexure- XVIII ***Syllabi***
Item 19	To review and finalize the ***list of experiments and skill based mini projects of II semester*** **B. Tech. programmes (batch admitted 2021-22 Session)** The ***list of experiments and skill based mini projects of II semester*** **B. Tech. programmes (batch admitted 2021-22 Session)** is reviewed and finalized. The list of Experiments were already finalised in last BOS held on 07June 2021. However, additional list for Skill Based mini Projects is proposed and finalised and Enclosed in Annexure-XIX *Experiment and skill based mini project*
Item 20	To propose the course "Economics Entrepreneurship & Management" and its syllabi along with the Course Outcomes (COs) for the V Semester B.Tech. (Batch admitted 2020-21 onwards). ***{to be proposed and recommended by*** *Management Department}*
Item 21	To revise and recommend the course "Energy, Environment, Ecology & Society" and its syllabi along with the Course Outcomes (COs) for the III Semester B.Tech. (Batch admitted 2021-22 onwards). **{inclusion of contents related to "Sustainability" is to be done}** ***{to be proposed and recommended*** by the *Civil Engineering Department}*
Item 22	To propose a new course: Universal Human Values & Professional Ethics (HVPE)& its syllabi along with the Course Outcomes (COs), as Mandatory Course (MC) for the batch admitted in 2020-21onwards **{A portion on 'gender sensitization 'also to be included in the syllabus of this cour**se} ***{to be proposed and recommended*** **by** *Humanities Department}*
Item 23	To review the CO attainments, to identify gaps and to suggest corrective measures for the improvement in the CO attainment levels for (i) I year April–September 2021 Semester (ii) January-June 2021 Session for II to IV year students The CO attainments, to identify gaps and to suggest corrective measures for the improvement in the CO attainment levels for (i) I year April–September 2021 Semester (ii) January-June 2021 Session for II to IV year students is observed and enclosed in Annexure-XX *Feedback*
Item 24	To review curricula feedback from various stakeholders, its analysis and impact **{Stakeholder feedback analysis must also contain an action taken report (ATR) and the details/data of the stakeholder who have responded through GOOGLE form (such as Name, organization, mail id, phone no if available) must also be shared along with the feedback for the alumni/employer.}** Stakeholder feedback analysis is shared and observed which is enclosed in Annexure-XXI *Feedback from various stakeholder*
Item 25	To review Course Outcomes (COs) feedback of various courses, its analysis and impact Course Outcomes (COs) feedback of various courses is analysed and impact is shown and observed which is enclosed in Annexure-XXII Link

Any other matter

1) Revised list of DE-2 and OC-2 for 2nd semester M.Tech Computer Science and Engineering is as follows:-

DE-2		
Course Code (SWAYAM)	**Subject Name**	**Subject Code**
noc22-cs20	Cloud computing	620216
noc22-cs30	Social Networks	620218
OC-2		
noc22-cs53	Introduction To Internet of Things	800204
noc22-cs22	Deep Learning	800205

Item 26

The list of Departmental Elective (DE-2 and OC-2) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for M.Tech II Semester, CSE discipline (under flexible curriculum) were discussed and finalized.

Scheme is also revised. The revised scheme is enclosed in Annexure-XXIII
M.Tech II Sem Scheme

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 2021-22) M Tech

noc22-cs32	Python for Data Science

Self-learning/ presentation through SWAYAM/NPTEL(Registration in a course will be compulsory for the students bus assessment will be based on internal seminar presentation)

DEAN (ACADEMICS)
M.I.T.S
GWALIOR

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Annexure-I

Scheme of Examination

B.Tech. VIII Semester (Computer Science and Engineering) *for batch admitted in Academic Session 2018-19*

S. No.	Subject Code	Category	Subject Name	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-5)	-	-	-	-	-	25	75	100	3	-	-	3
2.	DE	DE	Departmental Elective* (DE-6)	-	-	-	-	-	25	75	100	3	-	-	3
3.	OC	OC	Open Category * (OC-4)	-	-	-	-	-	25	75	100	2	-	-	2
4.	150801	DLC	Internship/Project (DLC-9)	-	-	-	250	150	-	-	400	-	-	6	3
5.	150802	-	Professional Development#	-	-	-	-	50	-	-	50	-	-	2	1
Total				-	-	-	**250**	**200**	**75**	**225**	**750**	**8**	**-**	**8**	**12**
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**											

***All of these courses will run through SWAYAM/NPTEL/ MOOC**

 # Evaluation will be based on participation/laurels brought by the students to the institution in national/state level technical and other events during the complete tenure of the UG programme (participation in professional chapter activities, club activities, cultural events, sports, personality development activities, collaborative events, MOOCs and technical events)

DE -5*		
S. No.	Subject Code	Subject Name
1.	150851	Social Network
2.	150854	Ethical Hacking
3.	150855	Hardware Security

DE-6*		
S. No.	Subject Code	Subject Name
1.	150856	Blockchain and its applications
2.	150857	Online Privacy
3.	150853	Reinforcement Learning

OC-4*		
S. No.	Subject Code	Subject Name
1.	900627	Ethical Hacking
2.	900619	Introduction to Internet of Things
3.	900628	Online Privacy

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

Annexure-I

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

Honours* *(to be opted by students of Parent Department)*	**Minor Specialization*** *(to be opted by students of Other Department)*
Advance Computer Architecture	Cloud Computing and Distributed Systems
Information Security - 5 - Secure Systems Engineering	Introduction to Machine Learning
Foundations of Cryptography	Data Science for Engineers

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

Annexure - II

Syllabus to Develop MOOC (**Internet of Things: An Overview**)

Department:	**Computer Science & Engineering**	
Name of Faculty:	**Dr. Anjula Mehto**	
Subject:	**Internet of Things: An Overview**	**Type: MOOC (Open Elective)**

Course Objectives-:

1. To study fundamental concepts of Internet of Things (IoT)
2. To understand roles of sensors in IoT
3. To Learn different protocols used for IoT design
4. Understand the role of IoT in various domains of Industry

Unit-1

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Functional Blocks, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M, Networking basics, Communication Protocols,

Unit-2

Sensors Networks : Sensing, Actuation, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

Unit-3

IoT Reference Architecture- Getting Familiar with IoT Architecture, Various architectural views of IoT such as Functional, Information, Operational and Deployment. Constraints affecting design in IoT - world- Introduction, Technical design Constraints, Reference Model of IoT

Unit-4

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet, Modbus. IP Based Protocols for IoT IPv6, 6LowPAN, RPL, REST, AMPQ, CoAP, MQTT. Edge connectivity and protocols

Unit-5

Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.

Syllabus to Develop MOOC (**Internet of Things: An Overview**)

Reference books-:

1. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014
2. Olivier Hersent, David Boswarthick, and Omar Elloumi, — "The Internet of Things: Key Applications and Protocols", Wiley Publications

Course Outcomes-:

Students are able to

CO1: Understand the various concepts, terminologies and model of IoT systems.
CO2: Recognize various devices, sensors and applications
CO3: Understand and apply various protocols for design of IoT systems
CO4: Understand various applications of IoT and its design issues.
CO5: Analyze various M2M and IoT architectures

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Scheme of Examination

B.Tech. VI Semester (Computer Science and 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		MOOCs						
				End Sem.	Mid Sem Exam.	Quiz/ Assign ment	End Sem.	Lab work & Sessional	Assign ment	Exam		L	T	P	
1.	150601	DC	Compiler Design (DC-12)	70	20	10	30	20			150	2	1	2	4
2.	150602	DC	Computer Networks (DC- 13)	70	20	10	-	-			100	4	-	-	4
3.	DE	DE	DE-1	70	20	10	-	-			100	4	-	-	4
4.	DE	DE	DE-2*	-	-	-	-	-	25	75	100	4	-	-	4
5.	OC	OC	OC-1	70	20	10	-	-			100	2	1	-	3
6.	100007	MC-4	Disaster Management	70	20	10	-	-			100	3	-	-	3
7.	150603	DLC-5	Minor Project-II	-	-	-	50	50			100	-	-	4	2
Total				350	100	50	80	70	25	75	750	19	2	6	24
Summer Internship-III (On Job Training) for Four weeks duration: Evaluation in VII Semester															
Additional Course for Honours or minor Specialization			Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization												

* At least one of these courses must be run through SWAYAM/NPTEL/MOOC

DE -1 (Through Traditional Mode)		
S. No.	Subject Code	Subject Name
1.	150611	Network & Web Security
2.	150612	Image Processing
3.	150613	Mobile Computing

DE -2*		
S. No.	Subject Code	Subject Name
1.	150656	Introduction To Internet of Things
2.	150657	Object Oriented System Development Using UML, Java And Patterns
3.	150654	An Introduction to Artificial Intelligence

OC-1		
S. No.	Subject Code	Subject Name
1.	900106	Data Structures
2.	900107	Python Programming

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

---

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

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

Honours* *(to be opted by students of Parent Department)*	**Minor Specialization*** *(to be opted by students of Other Department)*
GPU Architectures and Programming	Programming In Java (Programming)
Introduction to parallel programming with OpenMP and MPI	Data Base Management System (Programming)
Data Science for Engineers	Ethical Hacking (Systems)
	Computer Networks and Internet Protocol (Systems)

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

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal, M.P.)

Annexure-III

Syllabi of
Departmental Core (DC) Courses
B.Tech VI Semester
(Computer Science and Engineering)
Batch admitted in 2019-20

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal, M.P.)

Department of Computer Science and Engineering

COMPILER DESIGN
150601 (DC-12)

COURSE OBJECTIVES

- To learn finite state machines and context free grammar.
- To learn, various phases of compiler
- To understand process of compiler implementation.

Unit-I

Overview of Translation Process: Introduction to Compiler, Major Data Structures in Compiler, Other Issues in Compiler Structure, BOOT Strapping and Porting, Compiler Structure: Analysis-Synthesis Model of Compilation, Various Phases of a Compiler, Tool Based Approach to Compiler Construction.

Unit-II

Lexical Analysis: Input Buffering, Symbol Table, Token, Recognition of Tokens, Lexeme and Patterns, Difficulties in Lexical Analysis, Error Reporting and Implementation. Regular Grammar & Language Definition, Transition Diagrams, Design of a Typical Scanner using LEX.

Unit-III

Syntax Analysis: Context Free Grammars (CFGs), Ambiguity, Basic Parsing Techniques: Top Down Parsing, Recursive Descent Parsing, Transformation on the Grammars, Predictive Parsing LL(1) Grammar, Bottom-UP Parsing, Operator Precedence Parsing, LR Parsers (SLR, CLR, LALR), Design of a Typical Parser Using YACC.

Unit-IV

Semantic Analysis: Compilation of Expression, Control, Structures, Conditional Statements, Various Intermediate Code Forms, Syntax Directed Translation, Memory Allocation and Symbol Table Organizations, Static and Dynamic Array Allocation, String Allocation, Structure Allocation etc., Error Detection Indication and Recovery, Routines or Printing Various Lexical, Syntax and Semantic Errors.

Unit-V

Code Generation and Code Optimization: Issues, Basic Blocks and Flow Graphs, Register Allocation, Code Generation, DAG Representation of Programs, Code Generation from DAGS, Peep-hole Optimization, Code Generator Generators, Specification of Machine. Code Optimization: Source of Optimizations, Optimization of Basic Blocks, Loops, Global Data Flow Analysis, Solution to Iterative Data Flow Equations, Code Improving Transformations, Dealing with Aliases, Data Flow Analysis of Structured Flow Graphs.

RECOMMENDED BOOKS

- Compilers: Principles, Techniques and Tools, V. Aho, R. Sethi and J. D. Ullman, Pearson Education.
- Compiler Construction: Principles and Practice, K.C. Louden, Cengage Learning.

COURSE OUTCOMES

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

CO1. define the concepts of finite automata and context free grammar.

CO2. build the concept of working of compiler.

CO3. examine various parsing techniques and their comparison.

CO4. compare various code generation and code optimization techniques.

CO5. analyze different tools and techniques for designing a compiler.

CO6. design various phases of compiler.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal, M.P.)

Department of Computer Science and Engineering

COMPUTER NETWORKS 150602
(DC-13)

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- 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 protocols.

CO3. develop a concept for understanding advance computer network.

CO4. build the skill of IP addressing and routing mechanism.

CO5. predict the performance of computer network in congestion and internet.

CO6. construct the network environment for implementation of computer networking concept.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal. M.P.)

Syllabi of
Departmental Elective (DE-1) Courses
B.Tech VI Semester
(Computer Science and Engineering)
Batch admitted in 2019-20

Annexure-IV

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal, M.P.)

Department of Computer Science and Engineering

NETWORK & WEB SECURITY
150611 (DE-1)

COURSE OBJECTIVES

- To provide conceptual understanding of network security principles, issues, challenges and mechanisms.
- To understand how to apply encryption techniques to secure data in transit across data networks.
- To explore the requirements of real-time communication security and issues related to the security of web services.

Unit-I

Security: Principles and Attacks, Basic Number Theory: Prime Number, Congruence's, Modular Exponentiation, Fundamentals of Cryptography, Steganography, Cryptanalysis, Code Breaking, Block Ciphers and Steam Ciphers, Substitution Ciphers, Transposition Ciphers, Caesar Cipher, Play-Fair Cipher, Hill Cipher, Cipher Modes of Operation.

Unit-II

Cryptography: Symmetric Key Cryptography, Public Key Cryptography, Principles of Public Key Cryptosystem, Classical Cryptographic Algorithms: DES, RC4, Blowfish, RSA, Distribution of Public Keys and Key Management, Diffie-Hellman Key Exchange.

Unit-III

Hash Functions: Hash Functions, One Way Hash Function, SHA (Secure Hash Algorithm). Authentication: Requirements, Functions, Kerberos, Message Authentication Codes, Message Digest: MD5, SSH (Secure Shell), Digital Signatures, Digital Certificates.

Unit -IV

IP & Web Security Overview: SSL (Secure Socket Layer), TLS (Transport Layer Security), SET (Secure Electronic Transaction). IDS (Intrusion detection system): Statistical Anomaly Detection and Rule-Based Intrusion Detection, Penetration Testing, Risk Management. Firewalls: Types, Functionality and Polices.

Unit -V

Phishing: Attacks and its Types, Buffer Overflow Attack, Cross Site Scripting, SQL Injection Attacks, Session Hijacking. Denial of Service Attacks: Smurf Attack, SYN Flooding, Distributed Denial of Service. Hacker: Hacking and Types of Hackers, Foot Printing, Scanning: Types: Port, Network, Vulnerability), Sniffing in Shared And Switched Networks, Sniffing Detection & Prevention, Spoofing.

RECOMMENDED BOOKS

- Cryptography and Network Security, William Stallings, Pearson Education.
- Cryptography and Network Security, Atul Kahate, McGraw Hill Education.
- Incident Response and Computer Forensics, Kevin Mandia, Chris Prosise, Tata McGraw Hill.

COURSE OUTCOMES

After completion of the course students would be able to:

CO1. explain cryptographic algorithms, hash algorithms and authentication mechanisms.

CO2. illustrate fundamentals of number theory, attacks and security principles.

CO3. apply number theory and various algorithms to achieve principles of security.

CO4. analyze the cause for various existing network attacks and describe the working of available security controls.

CO5. examine the vulnerabilities in IT infrastructure.

CO6. predict the attacks and controls associated with IP, transport-level, web and e-mail security.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal, M.P.)

Department of Computer Science and Engineering

IMAGE PROCESSING
150612 (DE-1)

COURSE OBJECTIVES

- To understand the fundamentals of image acquisition, image processing in various domains.
- To understand image transformation, enhancement and restoration techniques used in image processing.
- To know image registration and segmentation used in image processing.

Unit- I

Introduction and Fundamentals: Introduction to Image Processing Systems, Digital Image Fundamentals: Components of Digital Image Processing System, Image Model, Imaging Geometry, Sampling and Quantization of Images, Classification of Digital Images, Zooming and Shrinking, Relationship Between Pixels.

Unit- II

Image Enhancement in Spatial Domain: Introduction, Basic Gray Level Function, Piecewise Linear Transformation, Contrast Stretching, Histogram Specification, Histogram Equalization, Local Enhancement using Arithmetic and Logical Operation- Image Subtraction, Image Averaging Image Smoothing: Smoothing Spatial Filters, Smoothing Linear Filters, Image Sharpening.

Unit- III

Image Enhancement in Frequency Domain: Introduction to Fourier Transform, Filters: Low Pass and High Pass, Gaussian Filters, Homomorphic Filtering.

Image Restoration- Model of Image Degradation/Restoration Process, Noise Models, Noise Reduction in Spatial Domain and Frequency Domain, Inverse Filtering, Mean Filters, Least Mean Square(Wiener) Filtering, Fir Wiener Filter.

Unit -IV

Morphological Image Processing: Logic Operation Involving Binary Images, Dilation And Erosion, Opening and Closing, Morphological Algorithms: Boundary Extraction, Region Filling, Extraction Of Connected Components, Convex Hull, Thinning, and Thickening.

Unit -V

Image Registration: Introduction, Geometric Transformation, Plane to Plane Transformation, Mapping.

Image Segmentation: Introduction, Region Extraction, Pixel Based Approach, Multilevel Thresholding, Local Thresholding, Region Based Approach, Region Growing, Splitting and Merging, Edge and Line Detection, Corner Detection, Detection of Discontinuities, Edge Linking and Boundary Detection.

RECOMMENDED BOOKS

- Digital Image Processing, Rafael C Gonzalez, Richard E Woods, Pearson Education.
- Fundamentals of Digital Image Processing, K. Jain, Pearson Education.
- Digital Image Processing, S. Esakkirajan, S. Jayaraman, T. Veerakumar, Tata McGraw-Hill Education.

COURSE OUTCOMES

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

CO1. define different modalities and current techniques in image processing.

CO2. classify spatial and frequency domain techniques used in image processing.

CO3. apply image processing techniques to enhance visual images.

CO4. analyse the constraints in image processing when dealing with real problems.

CO5. evaluate various enhancement, restoration and retrieval techniques of image processing.

CO6. design a system using the mathematical models and principles of digital image processing for real world problems.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal, M.P.)

Department of Computer Science and Engineering

MOBILE COMPUTING
150613 (DE-1)

COURSE OBJECTIVES

- To introduce the basic concepts and principles in mobile computing.
- To provide a computer systems perspective on the converging areas of wireless networking, mobile devices, and network protocols.
- To introduce wireless communication and networking principles, that support connectivity to cellular networks, wireless internet and sensor devices.

Unit-I

Review of Personal Communication Services (PCS): Basic Concepts of Cellular Systems, Global System for Mobile Communication (GSM), Protocols, Handover, Data Services, and Multiple Division Techniques.

Unit-II

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 Standard. Mobile IP.

Unit-III

Wireless Application Protocol (WAP): Mobile Internet Standard. WAP Gateway and Protocols, Wireless Markup Languages (WML).

Unit-IV

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) Vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of Services in 3G.

Unit-V

Wireless Local Loop (WLL): Introduction to WLL Architecture, WLL Technologies. Global Mobile Satellite Systems: Case Studies of IRIDIUM and GLOBALSTAR Systems. Bluetooth Technology, Wi-Fi and Wi-Max.

RECOMMENDED BOOKS

- Mobile communications, J. Schiller, Pearson Education.
- Wireless and Mobile Networks Architecture, by Yi —Bing Lin, John Wiley & Sons.
- Mobile & Personnel Communication Systems and Services, Raj Pandya, Prentice Hall India.
- Wireless Communication- Principles and Practices, Theodore S. Rappaport, Pearson Education.
- The Wireless Application Protocol, Singhal & Bridgman, Pearson Education.

COURSE OUTCOMES

After completion of the course students would be able to:

CO1. explain the basic concepts of mobile telecommunications system.

CO2. demonstrate the infrastructure to develop mobile communications system.

CO3. classify the different generations and technology for mobile communications.

CO4. examine the working of different protocols of wireless mobile communication technology.

CO5. determine the importance of each technology suitable for different situation of mobile and wireless communications.

CO6. develop protocols for adhoc and infrastructure based wireless networks.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Syllabi of
Open Category Courses
B.Tech VI Semester
(Computer Science and Engineering)

Batch admitted in 2019-20

Annexure-V

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

DATA STRUCTURES
900106 (OC-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. **Linked List:** Introduction, Implementation of Linked List, Operations, Circular Linked 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

Graphs: Background, Graph Theory Terminologies, Representation of Graphs- Sequential & Linked Representation, Path Matrix, Graph Traversals- BFS, DFS, Spanning Trees, Applications of Graph.

Unit-V

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.

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.

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

PYTHON PROGRAMMING
900107 (OC-1)

COURSE OBJECTIVES

- To understand the structure and components of a python program.
- To learn the basic construct of python programming for implementing interdisciplinary research-based problems.
- To plot data using appropriate python visualization libraries for analysis.

Unit I

Introduction to Python: Setting Up Programming Environment, Running Python Programs from a Terminal, Variables and Simple Data Types: Variables, Strings, Numbers and Maths, Comments, Conditional Statements, Introducing Loops, Working of Input Function.

Unit II

Tuples and Lists: Tuples, Lists, List Operations, Using If Statements with Lists, Organizing a List, Working with Lists: Looping through Entire List, Making Numeric Lists, Working with Part of List. Dictionaries and Sets: Simple Dictionary, Looping Through a Dictionary, Nesting, Example with a Dictionary, Fibonacci and Dictionaries, Global Variables, Defining a Set, Set Operations.

Unit III

Functions: Defining a Function, Passing Arguments, Return Values, Passing a List, Passing an Arbitrary Number of Arguments, Storing Functions in Module, In- Built Functions, Lambda Functions. **Classes and Inheritance:** Object Oriented Programming, Creating and using a Class, Working with Class Instances, Methods, Inheritance, Importing Classes, Python Standard Library.

Unit IV

Files and Exceptions: Reading from a File, Writing to a File, File Operations, Assertions, Exceptions, Exception example. **Debugging:** Programming Challenges, Classes of Tests, Bugs, and Debugging, Debugging examples.

Unit V

Data Visualization: Installing Matplotlib, Plotting a Simple Line Graph, Random Walks, Making Histogram. **Graphical User Interfaces:** Event-Driven Programming Paradigm; Tkinter Module, Creating Simple GUI; Buttons, Labels, Entry Fields, Dialogs; Widget Attributes - Sizes, Fonts, Colors, Layouts, Nested Frames.

RECOMMENDED BOOKS

- Python Crash Course: A Hands-On, Project-Based Introduction to Programming, By Eric Matthes.
- Learn Python the Hard Way: 3rd Edition.
- T.R. Padmanabhan, Programming with Python, Springer, 1st Ed., 2016.
- Kenneth Lambert, Fundamentals of Python: First Programs, Cengage Learning, 1st Ed., 2012.

COURSE OUTCOMES

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

CO1. understand basic python programming constructs
CO2. analyze various data structures available in python
CO3. implement the Object-oriented programming paradigm in Python
CO4. apply the different File handling operations
CO5. design GUI Applications in Python
CO6. construct graphical representation of data using python packages

---

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005

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

List of

Experiments

B.Tech VI Semester

(Computer Science and Engineering)

Batch admitted in 2019-20

Annexure-VI

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

Compiler Design
150601 (DC)
List of Experiments

1) Write a program to convert NFA to DFA
2) Write a program to minimize DFA.
3) Develop a lexical analyzer to recognize a few patterns.
4) Write a program to parse using Brute force technique of Top down parsing.
5) Develop LL (1) parser (Construct parse table also).
6) Develop an operator precedence parser (Construct parse table also).
7) Develop a recursive descent parser.
8) Write a program for generating for various intermediate code forms.
   i) Three address code
   ii) Polish notation
9) Write a program to simulate Heap storage allocation strategy.
10) Generate Lexical analyzer using LEX.
11) Generate YACC specification for a few syntactic categories.
12) Given any intermediate code form implement code optimization techniques.
13) Study of an Object-Oriented Compiler.

Annexure-VII

Scheme of
B.Tech IV Semester
For batch admitted 2020-21
(Computer Science & Engineering)
Under Flexible Curriculum
[Item-11]

Annexure-VII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Scheme of Examination

B.Tech. IV 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									
				End Term Evaluation		Continuous Evaluation		End Sem.	Continuous Evaluation			L	T	P			
				End Term Evaluation	$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
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	Blended (2/1)	PP
7.	2000XXX	CLC	Novel engaging courses					50	-		50	-	-	2	1	Interactive	SO
Total				250	50	100	100	230	60	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

$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.

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								
-	-	10	5	4	1	14	-	3	2	1	20
-		50	25	20	5	70	-	15	10	5	Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

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

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

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

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

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 1:

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

Unit 2:

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

Unit 3:

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

Unit 4:

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

Unit 5:

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

RECOMMENDED BOOKS

- Python Crash Course: A Hands-On, Project-Based Introduction to Programming, By Eric Matthes
- Learn Python the Hard Way: 3rd Edition
- T.R. Padmanabhan, Programming with Python, Springer, 1st Ed., 2016.
- Kenneth Lambert, Fundamentals of Python: First Programs, Cengage Learning, 1st Ed., 2012.

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

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.

RECOMMENDED BOOKS:

- J. Tremblay and R. Manohar: Discrete Mathematical Structures with Application to Computer science. • Narsingh Deo: Graph Theory.
- C.L.Liu: Discrete Mathematics.
- K.H. Rosen: Discrete Mathematics and its Applications
- S. Lipschutz, Discrete Mathematics

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Experiment list/ Lab manual for Laboratory Courses

B.Tech IV Semester

For batch admitted 2020-21

(Computer Science and Engineering)

Annexure-IX

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

DATABASE MANAGEMENT SYSTEM
150412 (DC)

List of Experiment

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

10. Study and implementation of Rollback, Commit, Savepoint.

Department of Computer Science and Engineering

PROGRAMMING LAB (Python Programming)

150415(DLC)

List of Experiment

---

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

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Skill Based Mini Projects
B.Tech IV Semester
For batch admitted 2020-21
(Computer Science and Engineering)

Annexure-X

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

COMPUTER NETWORKS
150411 (DC)

List of Skill Based Project

1) Design and demonstrate the operation of the Ethernet network to examine the performance of the Ethernet network under different scenario using the NET Simulator.
2) Design and demonstrate the implementation of a token ring network to examine the performance of the token ring network under different scenarios with the use of Net Simulator.
3) Design and demonstrate the basics of designing a network, taking into consideration the users, services, and locations of the hosts.
4) Configure and analyze the performance of the Open Shortest Path First (OSPF) routing protocol with the use of NET Simulator.
5) Design and demonstrate the congestion control algorithms implemented by the Transmission Control Protocol (TCP).
6) Examine the effect of different queuing disciplines on packet delivery and delay for different services using the NET Simulator.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

DATABASE MANAGEMENT SYSTEM
150412 (DC)
List of Skill Based Project

1. Blood Bank Management System .
2. Railway Management System .
3. Airlines Management System .
4. Courier Service Management System .
5. Attendance Management System .
6. Inventory Management System .
7. University Management System .
8. Online Shopping Management System .
9. Dispensary Management System .
10. Taxi Management System .
11. Retail Shop Management System .
12. Stadium Seat Booking Management System .

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

Department of Computer Science and Engineering

PROGRAMMING LAB.
150415(DLC)
Python Programming

List of Program

---

1. Visualize the Publically available real world data set using various function and identify the suitable plot for better representation.
2. Handle the missing data and categorical value in a real world Data Set.
3. Build a prediction model based on Classification Data Set
4. Build a prediction model based on Regression Data Set
5. Build a prediction model based on Clustering Data Set

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

B. Tech in Computer Science and Design

Scheme of
B.Tech I Semester
For batch admitted 2021-22
(Computer Science and Design)
Annexure-XI

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

B. Tech in Computer Science and Design

I Semester

For Batches admitted in Academic Session 2021-22 on wards

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									
				End Term Evaluation		Continuous Evaluation		End Sem Exam	Continuous Evaluation			L	T	P			
				End Sem. Exam	$Proficiency in subject /course	Mid Sem. Exam.	Quiz/Assignment		Lab Work & Sessional	Skill Based Mini Project							
1.	290101	DC	Introduction to Computer Science and Design	50	10	20	20	-	-	-	100	4	-	-	4	Blended (3/1)	MCQ
2.	230102	DC	Introduction to computer programming	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	AO
3.	100022	ESC	Basic Electrical & Electronics Engineering	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	MCQ
4.	250100	BSC	Linear Algebra	50	10	20	20	-	-	-	100	3	1	-	4	Offline	PP
5.	100015	HSMC	Energy, Environment, Ecology & Society	50	10	20	20	-	-	-	100	3	-	-	3	Online	MCQ
Total				**250**	**50**	**100**	**100**	**120**	**40**	**40**	**700**	**14**	**3**	**4**	**19**		

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

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

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

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								
4	3	7	3	2	-	4	4	11	-	-	19
21.05	15.78	36.84	15.78	10.52	-	21.05	21.05	57.89	-	-	Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V , Bhopal)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Syllabus of

B.Tech I Semester

For batch admitted 2021-22

(Computer Science and Design)

Annexure-XII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V . Bhopal)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTRODUCTION TO COMPUTER SCIENCE AND DESIGN

290101

COURSE OBJECTIVES:

- To understand the basics of computers.
- To familiarize the students with various design techniques.
- To implement design solutions using digital logic, algorithms, computer networks and software development techniques.

Unit I

Introduction to computers, Generation of computers, Classification of Computers, Hardware components, system bus. Computer memory and its types - RAM, ROM, Cache memory, Registers, secondary memory, memory hierarchy. Computer software - System software, application software. Operating system, its types and services. Booting.

Unit II

Von-Neumann Model, Various Subsystems, Binary numbers, Number Base Conversions, Complements, Signed Binary numbers, Binary Codes, Representation of sign (sign magnitude, two's complement). Boolean algebraic axioms, Boolean functions, truth tables.

Unit III

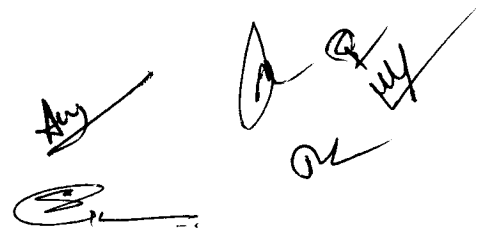
Fundamentals of Algorithm, Problem Solving, Characteristics, need for algorithms, Important Problem Types, Flowcharts for different problems.

Unit IV

Introduction to computer network, Types- LAN, MAN & WAN, Topologies, Serial & Parallel transmissions, Simplex, Half duplex & full duplex modes of transmission, Connecting Devices – Repeaters, Hub, Switch, Bridge, Router, Gateway and Modem.

Unit V

Introduction to Software, Types, Characteristics, Software development life cycle (SDLC), The World Wide Web, Web Browsers, Uniform Resource Locators(URL), Domain Name System (DNS), HTML, Basic Text Markup, Lists, Tables, Forms, Hyperlinks, Multimedia.



RECOMMENDED BOOKS:

- Fundamentals of Computer Engineering, E. Balagurusamy, Tata McGraw Hill Education Pvt. Ltd.
- Introduction of Computers : Peter Norton, TMH
- Computer Networks: Andrew Tananbaum, PHI
- Basic Computer Engineering: Silakari and Shukla, Wiley India

COURSE OUTCOMES:

After completion of the course students would be able to:

CO1: Define the fundamentals of computer systems.

CO2: Outline various components of the computer system.

CO3: Analyse basics of digital circuit design techniques.

CO4: Design algorithms for solving problems using computers.

CO5: Explain the importance of computer networks.

CO6: Choose suitable development tools to create web based applications for solving real world problems.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005

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

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Scheme of

B.Tech First Semester

For batch admitted 2020-21

(Computer Science & Engineering)

Under Flexible Curriculum

[Item-15]

Annexure-XIII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IT WORKSHOP (150112)

COURSE OBJECTIVES:

- To Understand the basics principles of computer, internet and computer security
- To Understand the basic productive IT tools
- To Learn the language of the web: HTML & CSS
- To learn and understand Python programming basics and paradigm

UNITI

Introduction & evolution of internet, Study of various internet based services like Email, social network, chat, web browsers, google services etc. Introduction to cyber security and cyber laws,awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber-attacks.

UNIT II

Professional word documents excel spread sheets and power point presentations using the Microsoft suite of office tools, Operating System and Software Installations: Introduction to operating system. Operating system types & evolution of operating system, Introduction to software, Types of software i.e., MS office, Media players,Winrar etc.

UNIT III

Introduction to html, html text editors, html building blocks, html tags, html attributes, html elements, html formatting, html heading, html paragraphs, html phrase tags, html anchors, html images, html tables, html list, html form, html with CSS, html classes, html frames, html Java scripts

UNIT IV

Introduction to python, Unique features of Python, Python-2 and Python-3 differences, Install Python and Environment Setup, First Python Program,Python Identifiers, Keywords and Indentation, Comments and document interlude in Python, Command line arguments.

UNIT V

Getting User Input, Python Data Types, What are variables?, Python Core objects and Functions, Number and Math's, Control Statements, List, Python Dictionaries and Sets, Input

and Output in Python, Python built in function, Case study using HTML, Case study using Python.

RECOMMENDED BOOKS:

[1]. VamsiKurama, "Python Programming: A Modern Approach", Pearson India, 2017. [2]. Charles Severance, " Python for Informatics- Exploring Information", 1stedition Shroff Publishers, 2017.

[2] Thomas A. Powell " Thecomplte references HTML and CSS", Fifth edition, Mc Graw Hill Publication.

COURSE OUTCOMES:

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

CO1: Understand the basic concept and structure of application software.

CO2: Identify the existing configuration of the computers and peripherals.

CO3: Integrate the PCs into local area network and re-install operating system and various application programs.

CO4: Design and develop basic web pages using HTML and CSS.

CO5: Design & create and implement a static and dynamic webpage

CO6: Design and implement a program to solve a real world problem.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IT WORKSHOP

List of Experiments

1) Apply following operation on Excel Spreadsheet
   Deleting a Column or a Row
   Inserting a Row
   Sorting
   Displaying Formulas in the Worksheet
   Copying Cells, Columns or Rows
   Justification of Cell Contents
2) Perform following Function on Excel Spreadsheet
   AutoSum
   Max
   Min
   Average
3) Write a program to describe various text formatting commands.
4) Create HTML Login form.
5) Create google form for registration of students using google services.
6) Write a Program to create a simple layout of Webpage.
7) Write a Program to divide a page into Frames.
8) Write python program to swap two variable without using temporary variable.
9) Write a program two find largest number among three numbers.
10) Write a Python programs that makes use of conditional and control flow structures

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR - 474005
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal, M.P.)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IT WORKSHOP

SKILL BASED PROJECTS

1. Design & implement a login form in html.
2. Design & implement a registration form for college event.
3. Design & implement your dynamic portfolio page.
4. Create an animation with the help of html & CSS..
5. Create a Google classroom for your subject.
6. Design & implement a calculator in python.
7. Create your blog by using Google blogger.
8. Create YouTube channel or monetization it.
9. Create an alarm by python.
10. Create a Quiz game in python.

Scheme of
B.Tech II Semester
For batch admitted 2021-22
(Computer Science and Design)
Annexure-XIV

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute affiliated to RGPV, Bhopal)

Syllabi of
Departmental Courses (DC) Courses
B.Tech II Semester
For batch admitted 2021-22
(Computer Science and Design)
Under Flexible Curriculum

Annexure-XV

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

B. Tech in Computer Science and Design

II Semester

For Batches admitted in Academic Session 2021-2

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									
				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		L	T	P			
1.	250106	BSC	Probability and Random Process	50	10	20	20	-	-	-	100	3	1	-	4	Offline	PP
2.	290201	DC	Digital Electronics	50	10	20	20	-	-	-	100	2	1	-	3	Blended (2/1)	PP
3.	290202	DC	Data Structures	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	PP
4.	290203	DC	Object Oriented Programming and Methodology	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	AO
5.	100016	HSMC	Technical Language	50	10	20	20	-	-	-	100	2	1	-	3	Blended (2/1)	PP
6.	100017	HSMC	Language Lab	-	-	-	-	60	20	20	100	-	-	2	1	Offline	SO
Total				250	50	100	100	180	60	60	800	13	3	6	19		
Summer Internship Project – I (Institute Level) (Qualifier): Minimum two-week duration: Evaluation in III Semester.																	

MCQ: Multiple Choice Question AO: Assignment + Oral OB: Open Book PP: Pen Paper SO: Submission &Oral CLC: College level course, 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 ,one minute paper writing etc. in that particular course/subject

Mode of Teaching						Mode of Examination					Total Credits
Theory				Lab	NEC	Theory			Lab	SIP/ SLP/ NEC	
Offline	Online	Blended Offline	Blended Online	Offline	Interactive	PP	A+O	MCQ	SO	SO	
4	-	8#	4	3	-	14	4	-	1	-	19
21	-	42	21	16	-	74	21	-	5	--	Credits %

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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

OBJECT ORIENTED PROGRAMMING AND METHODOLOGY
290203 (DC-3)

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 t o 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- Default Constructor, 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.

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

Skill Based Mini Projects
B.Tech II Semester
For batch admitted 2021-22
(Computer Science and Design)
Annexure-XVI

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Data Structures (290202)

List of Experiment

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

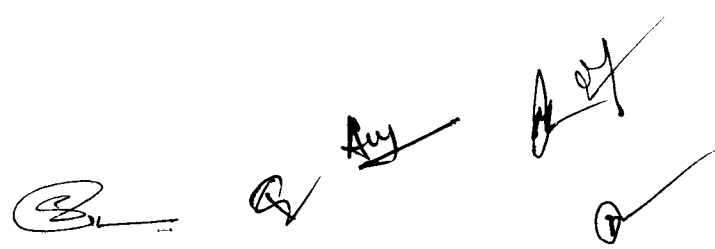
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV. Bhopal)

Object Oriented Programming & Methodology (290203)

List of Experiment

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 aclass.
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 classmethods.
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 theanomaly.
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 theirvolume.
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 inC++.

* * * * * * * * * * * *



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

Data Structure (290202)

SKILL-BASED MINI-PROJECTS

1. Linked-list based project:

1. Cyclic double list
2. Cyclic double sentinel list
3. Cyclic list
4. Cyclic sentinel list
5. Double list
6. Double sentinel list
7. Sentinel list
8. Single list
9. Sorted double list
10. Sorted double sentinel list
11. Sorted sentinel list
12. Sorted single list

2. Array-based projects

1. Drop off stack
2. Navigation stack
3. Range stack
4. Dual stack
5. Dynamic stack
6. Dynamic queue
7. Dynamic deque

3. Tree-based projects

1. AVL tree
2. B tree
3. Expression tree
4. File system
5. Lazy deletion tree
6. Quad tree

4. Graph based projects

1. Dijkstra's algorithm
2. Prim's algorithm
3. Topological sort
4. Kruskal algorithm

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Object Oriented Programming & Methodology (290203)

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.*

* * * * * * * * * * *

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Scheme of

B.Tech II Semester

For batch admitted 2021-22

(Computer Science and Engineering)

Annexure-XVII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Scheme of Examination

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

For batches admitted in Academic Session 2021-22

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									
				End Sem.		Mid Sem.	Quiz/ Assignment	End Sem.	Lab work / Sessional	S Skill Base mini Project		L	T	P			
				End Term Evaluation	$Proficiency in subject /course												
1.	100011	BSC	Engineering Mathematics –I	50	10	20	20	-	-	-	100	3	1	-	4	Offline	PP
2.	~~150211~~ 150214	DC	Data Structures	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	PP
3.	150212	DC	Object Oriented Programming & Methodology	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	A+O
4.	150213	DC	Digital Electronics	50	10	20	20	-	-	-	100	2	1		3	Blended (2/1)	PP
5.	100016	HSMC	Technical Language	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	PP
6.	100017	HSMC	Language Lab	-	-	-	-	60	20	20	100	-	-	2	1	Offline	SO
			Total	250	50	100	100	180	100	60	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

$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

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

Syllabi of

Departmental Courses (DC) Courses

B.Tech II Semester

For batch admitted 2021-22

(Computer Science & Engineering)

Under Flexible Curriculum

Annexure- XVIII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

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, Mcgrawhill.
- 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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

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 t o 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- Default Constructor, 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.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

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. Prime Implicants and Essential Prime Implicants definition.

Unit-III

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

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

List of Experiments
and
Skill Based Mini Projects
B.Tech II Semester
For batch admitted 2021-22
(Computer Science and Engineering)
Annexure-XIX

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

Data Structures (150211)

List of Experiment

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

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

Department of Computer Science and Engineering

Object Oriented Programming & Methodology (150212)

List of Experiment

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 aclass.
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 theirvolume.
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 inC++.

* * * * * * * * * * * *

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

Department of Computer Science and Engineering

Data Structure (150211)

SKILL-BASED MINI-PROJECTS

1. Linked-list based project:

1. Cyclic double list
2. Cyclic double sentinel list
3. Cyclic list
4. Cyclic sentinel list
5. Double list
6. Double sentinel list
7. Sentinel list
8. Single list
9. Sorted double list
10. Sorted double sentinel list
11. Sorted sentinel list
12. Sorted single list

2. Array-based projects

1. Drop off stack
2. Navigation stack
3. Range stack
4. Dual stack
5. Dynamic stack
6. Dynamic queue
7. Dynamic deque

3. Tree-based projects

1. AVL tree
2. B tree
3. Expression tree
4. File system
5. Lazy deletion tree
6. Quad tree

4. Graph based projects

1. Dijkstra's algorithm
2. Prim's algorithm
3. Topological sort
4. Kruskal algorithm

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

Object Oriented Programming & Methodology (150212)

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.*

* * * * * * * * * * *

Annexure – XX

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Summary of CO Attainment for Session Jan. - June 2021

Semester	Total No of courses	Total number of COs	Number of COs not attained	Percentage of COs not attained
1st	4	24	0	0
2nd	12	70	1	1.43
4th	4	24	0	0
6th	6	36	0	0
8th	1	6	0	0
Total	**27**	**160**	**1**	**0.63**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO attainment with Gap Analysis and action taken for I year Jan. – September 2021

Sem	Cource name	Course Outcmes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
I	230102: Introduction to Computer Programming	identify situations where computational methods and computers would be useful.	78	89	79	76.8	79.025	3	85	3	3	2.3	Attained	-
		describe the basic principles of imperative and structural programming.	88	88	85	86.4	86.45	3	82	3	3	2.5	Attained	-
		develop a pseudo-code and flowchart for a given problem.	83	85	77	80	80.25	3	85	3	3	2.2	Attained	-
		analyze the problems and choose suitable programming techniques to develop solutions.	89	88	76	88	85.125	3	77	3	3	2.3	Attained	-
		design, implement, debug and test programs.	81	81	85	76	79.5	3	74	3	3	2	Attained	-
		design computer programs to solve real world problems.	94	82	74	84.8	82.9	3	76	3	3	2	Attained	-
I	100015: EEES	Describe various energy resources, their conversion to electrical power and role in technological & economic development.	92	98	94	93.6	94.05	3	82	3	3	2.4	Attained	-
		Update with national/international power status and renewable power development targets & missions.	96	88	87	84.8	87.15	3	76	3	3	2.4	Attained	-
		Recognize the impact of pollution on the ecosystem and control policies adopted at national/international levels.	94	85	89	85.6	87.425	3	88	3	3	2.4	Attained	-
		Illustrate the concepts of ecosystems and their conservation.	92	88	88	92.8	90.9	3	79	3	3	2.4	Attained	-
		Solve practical problems of society in a sustainable and ethical manner.	95	89	89	89.6	90.05	3	74	3	3	2.4	Attained	-
		Fulfill professional duties keeping in mind the environmental safety, health, and welfare of public.	93	95	87	89.6	90.05	3	75	3	3	2.2	Attained	-
I	230102: Introduction to Computer Programming LAB	identify situations where computational methods and computers would be useful.	87	78	85	72	77.875	3	85	3	3	2.3	Attained	-
		Implement the basic concepts of imperative and structural programming.	82	76	88	92	87.75	3	82	3	3	2.5	Attained	-
		develop a pseudo-code and flowchart for a given problem.	87	75	87	92	88	3	85	3	3	2.2	Attained	-
		Design and analyze the problems and choose suitable programming techniques to develop solutions.	88	82	85	60	72.5	3	77	3	3	2.3	Attained	-
		design, implement, debug and test programs.	86	81	79	76	78.625	3	74	3	3	2	Attained	-
		design computer programs to solve real world problems.	82	80	72	92	84.25	3	76	3	3	2	Attained	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO attainment with Gap Analysis and action taken for I year Jan. – September 2021

Sem	Cource name	Course Outcmes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
I	IT workshop	To understand the basics of computer Hardware	75	90	75	74	76.375	3	83	3	3	2.1	Attained	-
		To learn networking concepts	86	86	84	84	84.5	3	80	3	3	2.4	Attained	-
		To learn basics html programming concepts	82	85	76	80	79.875	3	83	3	3	2.3	Attained	-
		To understand the principle of web design	88	87	77	88	85.125	3	76	3	3	2	Attained	-
		To develop htmp web pages	82	82	84	75	79	3	73	3	3	2	Attained	-
		To develop the HTMP based website	93	80	73	83	81.375	3	75	3	3	2	Attained	-
II	150211-Data Structures	Outline the basics of algorithms and their performance criteria	84	75	62.67	72	71.5425	3	74	3	3	2.5	Attained	-
		Explain the working of linear/nonlinear data structures	83	74	62.67	76	73.2925	3	75	3	3	2.2	Attained	-
		Identify the appopriate data structures to solve specific problems	87	69	65.33	74	72.8325	3	81	3	3	2.2	Attained	-
		Analyze the performance of various data structures and their applications	88	72	65.33	78	75.3325	3	71	3	3	2.2	Attained	-
		Evaluate time/space complexities of various data structures and their applications	85	75	64	68	70	3	65	2.5	2.9	2.2	Attained	-
		Design optimal algorithamic solution to various problems	86	78	66.67	72	73.1675	3	68	2.8	3	2.2	Attained	-
II	150212-Object oriented Programming & Methodology	tell the concepts of classes and objects and their significance in real world	86	94	73.6	82	81.9	3	77	3	3	2.3	Attained	-
		explain the benefits of object oriented design	95	97.58	94.4	84.68	90.0125	3	80	3	3	2.3	Attained	-
		built C++ classes using appropriate encapsulation and design principles	81	83.5	65.6	84.6	79.2625	3	76	3	3	2.3	Attained	-
		analyse the utilisation of inheritance and polymorphism in the solution of problems	83	87	73.6	79.8	79.55	3	75	3	3	2.2	Attained	-
		choose appropriate object oriented programming concepts for solving real world problems	79.5	89	92	72.3	80.2125	3	73	3	3	2.3	Attained	-
		develop solutions to problems demonstrating usage of control structures, modularity, I/O, and other standard language constructs	84.6	78	83.2	78.6	80.425	3	71	3	3	2.3	Attained	-
	150212-Object	Tell the basic concepts of OOPS	92	82	72	82	80.75	3	86	3	3	2.4	Attained	-
		explain the benefits of OOPS for solving real world problems	84	76	92	87	86.5	3	76	3	3	2.4	Attained	-
		built C++ classes using appropriate encapsulation and design principles	79	91	92	82	85.25	3	84	3	3	2.4	Attained	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO attainment with Gap Analysis and action taken for I year Jan. – September 2021

Sem	Cource name	Course Outcmes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
II	150212-Object oriented Programming & Methodology LAB	implement inheritance and polymorphism in C++	88	89	60	75	74.625	3	86	3	3	2.4	Attained	-
		choose appropriate object oriented programming concepts for solving real world problems.	82	84	76	82	80.75	3	79	3	3	2.4	Attained	-
		develop solutions to problems demonstrating usage of control structures, modularity, I/O, and other standard language constructs	78	86	92	81	84	3	73	3	3	2.4	Attained	-
II	150213-Digital Electronics	Explain the computer architecture for defining basic component and functional unit	87	91	89	81	85	3	75	3	3	2.2	Attained	-
		Recall different number system and solve the basic arithmetic operations.	88	85	88	78	82.625	3	78	3	3	2.2	Attained	-
		Develop the understanding of combinational circuits.	91	90	89	75	82.375	3	81	3	3	2.2	Attained	-
		Analyze the basic concepts of sequential circuits	89	84	85	71	78.375	3	79	3	3	2.2	Attained	-
		Compare various memories	91	86	82	76	80.625	3	75	3	3	2.2	Attained	-
		Solve the Boolean functions using logic gates	92	82	81	79	81.5	3	77	3	3	2.2	Attained	-
II	100016-Technical Language	Speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes	99		97	96.5	84.875	3	64	2.4	2.9	2.25	Attained	-
		Prepare oral presentations and arguments within the Engineering Profession effectively	95		95	65.32	68.285	2.8	69.5	3	2.8	2.25	Attained	-
		Demonstrate knowledge and comprehension of major text and traditions in language as well as its social, cultural, and historical context	95	95	96	75.42	85.46	3	64	2.4	2.9	2.25	Attained	-
		Read a variety of Text analytically so as to demonstrate in writing and/or speech the interpretation of texts	93.75	98.75	96.25	85.85	91.05	3	70	3	3	2.25	Attained	-
		Interpret text written in English assessing the results in written and oral arguments using appropriate material for support	97.5	97.5	100	77.1	87.925	3	70.5	3	3	2.25	Attained	-
		Speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes		80	100	92	81	3	64	2.4	2.9	2.4	Attained	-
		Deliver effectively oral presentations.		80	100	92	81	3	69.5	3	3	2.4	Attained	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO attainment with Gap Analysis and action taken for I year Jan. – September 2021

Sem	Cource name	Course Outcmes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
II	100017-Language Lab	Grasp knowledge and comprehensive skills to speak on a given topic on spot		62	100	92	78.75	3	64	2.4	2.9	2.4	Attained	-
		Interpret English spoken by others and respond to situation		62	100	92	78.75	3	70	3	3	2.4	Attained	-
		Analyse English Language as spoken by others in day to day life.		80		92	56	1.6	70.5	3	1.9	2.4	Not Attained	Conducted remedial Classes
I	BASIC COMPUTER ENGINEERING (100023) Branch: ME/AU	Define the fundamentals of computer system	94	91	83	74	80.875	3	88	3	3	2.5	Attained	-
		Outline the various components of computer system	95	94	85	81	85.375	3	86	3	3	2.5	Attained	-
		Design, implement, test and debug the computer programs using programming language	84	78	77	71	75	3	79	3	3	2.2	Attained	-
		Analyze the usage of various system & application softwares to manage computer system and data	89	87	79	81	82.25	3	84	3	3	2.3	Attained	-
		Analyze the usage of various system & application softwares to manage computer system and data	88	88	81	83	83.75	3	88	3	3	2.3	Attained	-
		Elaborate the working of Internet	90	88	83	84	85	3	84	3	3	2.3	Attained	-
I	BASIC COMPUTER ENGINEERING LAB (100023) Branch: ME/AU	Understand the bsics of procedural oriented programming	88	84	81	85	84.25	3	86	3	3	2.4	Attained	-
		Outline the concepts of structured programming	86	87	84	82	83.625	3	87	3	3	2.4	Attained	-
		Design algorithms and flowcharts for solving problems	79	75	71	74	74	3	85	3	3	2.2	Attained	-
		Apply the concepts of C/C++ prrogramming to solve real world problems	79	71	68	69	70.25	3	79	3	3	2.2	Attained	-
		Design, implement, test and debug the computer programs using programming language	75	68	67	67	68.125	2.8	74	3	2.8	2.2	Attained	-
		Create basic HTML pages	85	83	72	81	79.5	3	75	3	3	2.2	Attained	-
II	BASIC COMPUTER ENGINEERING	Define the fundamentals of computer system	95	93	85	77	83.25	3	82	3	3	2.5	Attained	-
		Outline the various components of computer system	94	92	87	80	85	3	84	3	3	2.5	Attained	-
		Design, implement, test and debug the computer programs using programming language	87	81	75	68	73.75	3	76	3	3	2.2	Attained	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO attainment with Gap Analysis and action taken for I year Jan. – September 2021

Cource name	Course Outcmes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
ENGINEERING (100023) Branch: EE	Analyze the usage of various system & application softwares to manage computer system and data.	91	88	76	81	81.875	3	81	3	3	2.3	Attained	-
	Analyze the usage of various system & application softwares to manage computer system and data	92	87	81	83	84.125	3	84	3	3	2.3	Attained	-
	Elaborate the working of Internet	90	86	80	80	82	3	78	3	3	2.3	Attained	-
BASIC COMPUTER ENGINEERING LAB (100023) Branch: EE	Understand the bsics of procedural oriented programming	88	83	84	81	82.875	3	88	3	3	2.4	Attained	-
	Outline the concepts of structured programming	86	88	86	82	84.25	3	84	3	3	2.4	Attained	-
	Design algorithms and flowcharts for solving problems	76	78	70	75	74.25	3	78	3	3	2.2	Attained	-
	Apply the concepts of C/C++ prrogramming to solve real world problems	80	70	71	71	72	3	77	3	3	2.2	Attained	-
	Design, implement, test and debug the computer programs using programming language	77	69	66	68	68.75	2.9	74	3	2.9	2.2	Attained	-
	Create basic HTML pages	88	80	71	82	79.75	3	82	3	3	2.2	Attained	-
BASIC COMPUTER ENGINEERING (100023) Branch: Civil	Define the fundamentals of computer system	82	88	79	74	78	3	85	3	3	2.5	Attained	-
	Outline the various components of computer system	84	83	81	83	82.625	3	86	3	3	2.5	Attained	-
	Design, implement, test and debug the computer programs using programming language	71	69	68	66	67.5	2.8	79	3	2.8	2.2	Attained	-
	Analyze the usage of various system & application softwares to manage computer system and data.	81	83	79	75	77.75	3	81	3	3	2.3	Attained	-
	Analyze the usage of various system & application softwares to manage computer system and data.	82	88	76	73	76.75	3	84	3	3	2.3	Attained	-
	Elaborate the working of Internet.	83	85	78	71	76	3	86	3	3	2.3	Attained	-
BASIC COMPUTER ENGINEERING	Understand the bsics of procedural oriented programming	91	85	83	78	81.75	3	85	3	3	2.4	Attained	-
	Outline the concepts of structured programming	89	86	81	76	80.125	3	86	3	3	2.4	Attained	-
	Design algorithms and flowcharts for solving problems	83	78	75	65	71.375	3	74	3	3	2.2	Attained	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO attainment with Gap Analysis and action taken for I year Jan. – September 2021

Sem	Cource name	Course Outcmes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
II	ENGINEERING LAB (100023) Branch: Civil	Apply the concepts of C/C++ prrogramming to solve real world problems	78	71	73	68	70.875	3	72	3	3	2.2	Attained	-
		Design, implement, test and debug the computer programs using programming language	75	70	68	64	67.125	2.7	74	3	2.8	2.2	Attained	-
		Create basic HTML pages	79	73	75	68	71.75	3	73	3	3	2.2	Attained	-

	Excellent (3)	Very Good (2)	Good (1)
Attainment Levels	70	60	50

Total CO Attainment = 80% of Direct CO Attainment + 20% of Indirect CO Attainment

Direct CO Attainment = 12.5% of Weekly Quiz Score +
12.5% of Weekly Assignment Score +
25% of Mid Sem Exam Score +
50% of End Sem Exam Score

For **Indirect CO attainment:** CO feedback from the students, by respective course instructor, was collected (via Institute's MOODLE), along with the course end seminar and one minutes paper writing

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B. Tech. Computer Science & Engineering

CO Attainment, Gap Analysis and Action Taken II to IV Year (Session: Jan. - June 2021 Semester)

Sem	Course Name	Course outcomes		CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Level of Total Attainment	Target	Attained/ Not Attained	Action Taken
IV	150401: Design and Analysis of Algorithm	CO1	Tell the basic features of an Algorithms	93.6	72	89.28	3	2.5	Attained	-
IV		CO2	Demonstrate a familiarity with major Algorithms and Data Structures	95.2	81.3	92.42	3	2.5	Attained	-
IV		CO3	Apply important algorithmic design paradigms and methods of analysis	76.8	69.33	75.306	3	2.5	Attained	-
IV		CO4	Analyze the asymptotic performance of Algorithms	92.8	85	91.24	3	2.5	Attained	-
IV		CO5	Compare different design techniques to develop algorithms for computational problems	97.6	71	92.28	3	2.5	Attained	-
IV		CO6	Design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach	96	73	91.4	3	3	Attained	-
IV	150403: Operating system	CO1	Tell the basic concept of operating systems	96	85.8	93.96	3	2.5	Attained	-
IV		CO2	Explain the working of operating system	97.6	83.8	94.84	3	2.5	Attained	-
IV		CO3	Develop the solution of various operating system problems/issues	96.8	81.9	93.82	3	2.5	Attained	-
IV		CO4	Analyze the various operating system problem/issues	95.2	83.4	92.84	3	2.5	Attained	-
IV		CO5	Measure the performance of various scheduling/allocation approaches.	92.8	84.8	91.2	3	2.5	Attained	-
IV		CO6	Test the working of various scheduling/allocation approaches	96.8	83.9	94.22	3	3	Attained	-
IV	150404: Computer System Organization	CO1	Recall the basic building blocks of computer Architecture	100	63.76	92.752	3	3	Attained	-
IV		CO2	Compare different memories	77.6	66.67	75.414	3	3	Attained	-
IV		CO3	Apply the concept of memory mapping, multiprocessor and pipelining in solving real world problems	100	55.07	91.014	3	3	Attained	-
IV		CO4	Analyze various modes of Input-Output data transfer	77.6	63.76	74.832	3	3	Attained	-
IV		CO5	Evaluate the arithmetic related to the number system	80	63.76	76.752	3	3	Attained	-
IV		CO6	Develop the skill of writing low level programming	72.8	60.86	70.412	3	3	Attained	-
IV	100004: Cyber Security	CO1	Tell the basic terminologies of cyber security	97.6	85	95.08	3	3	Attained	-
IV		CO2	Explain the basic concepts of Networking and Internet	97.6	83.4	94.76	3	3	Attained	-
IV		CO3	Apply various methods used to protect data in the internet environment in real world situations	99.2	82.4	95.84	3	3	Attained	-
IV		CO4	Discover the Concepts of IP security and Architecture	96	80.6	92.92	3	3	Attained	-

Annexure - XXI

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)

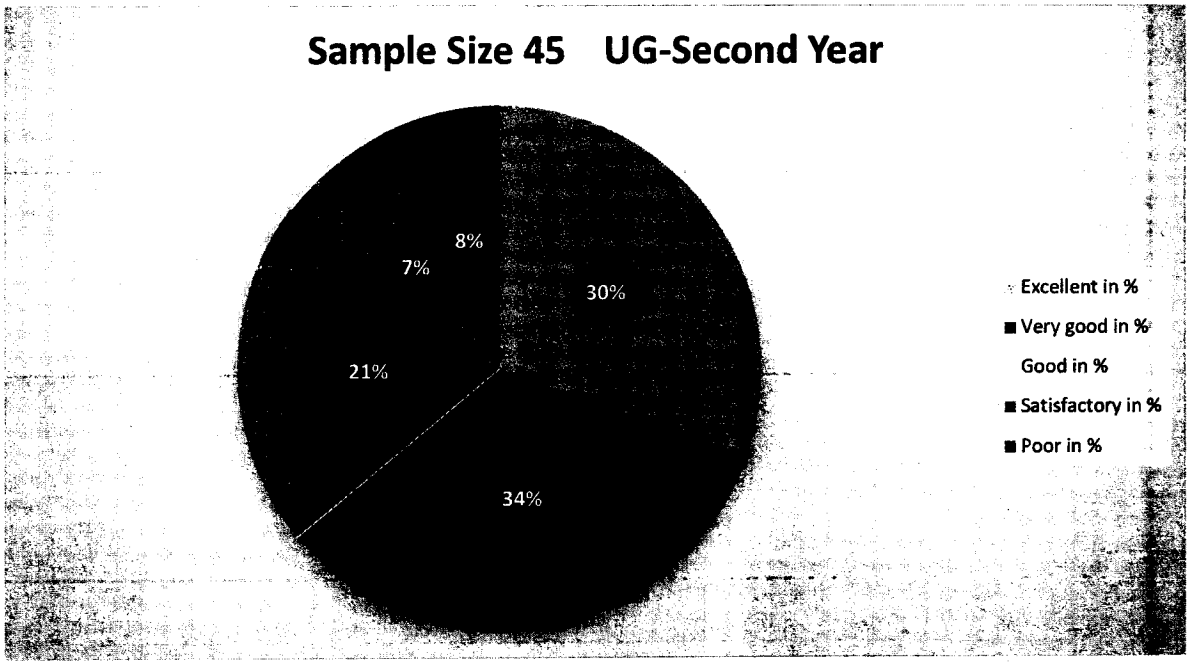
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Computer Science and Engineering

Student Course Curriculum Feedback Analysis (July – Dec 2021)

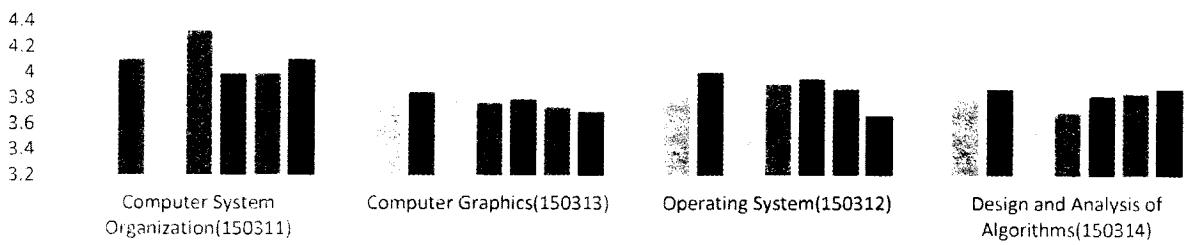
Summary Sheet -UG Second Year (III Sem)-Sample Size 45

Parameter(Average Grading)			Excellent in %	Very good in %	Good in %	Satisfactory in %	Poor in %
Sr. No	Subject Code	Subject Name					
1	150311	Computer System Organization	33.33	50.79	6.34	7.93	1.58
2	150313	Computer Graphics	34.4	28.56	24.26	6.82	5.88
3	150312	Operating System	32.07	30.15	30.12	7.26	0
4	150314	Design and Analysis of Algorithms	28.54	32.9	29.55	8.63	0.35



Parameter(Average Grading)		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 career expectations	7. The course will be useful to meet your higher studies/future aspirations.
Subject Code	**Subject Name**							
150311	Computer System Organization	4	4.11	3.88	4.33	4	4	4.11
150313	Computer Graphics	3.76	3.86	3.8	3.77	3.8	3.74	3.7
150312	Operating System	3.82	4.01	3.82	3.92	3.96	3.88	3.67
150314	Design and Analysis of Algorithms	3.81	3.88	3.65	3.7	3.83	3.85	3.88

Sample Size 45 UG-Second Year

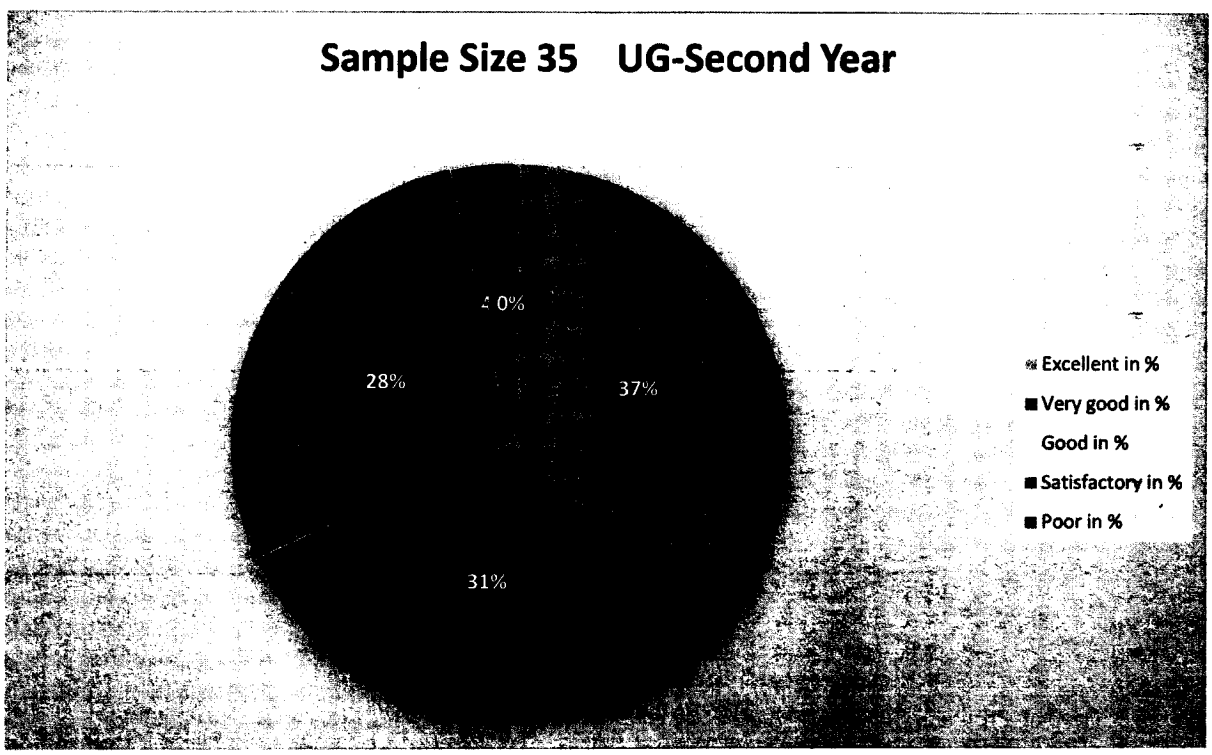


Students Comments:

Course Code and 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?
150314 Design and Analysis of Algorithms	NO	NO	NO
150313 Computer Graphics	No need	Every thing is just fine	No
150313 Computer Graphics	nothing	Not need	Nope

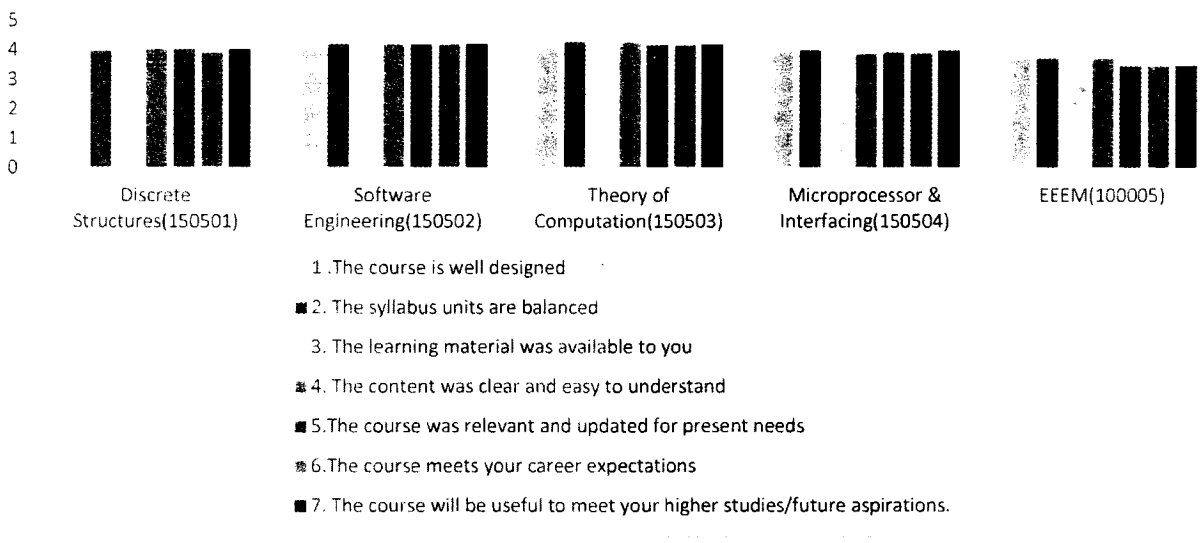
Summary Sheet -UG Third Year (V Sem)-Sample Size 35

Parameter(Average Grading)			Excellent in %	Very good in %	Good in %	Satisfactory in %	Poor in %
Sr. No	Subject Code	Subject Name					
1	150501	Discrete Structures	34.8	31.2	33	0.08	0
2	15502	Software Engineering	43.8	31.4	22.85	1.9	0
3	150503	Theory of Computation	47.14	30	22.8	0	0
4	150504	Microprocessor & Interfacing	34.12	34.38	26.4	5.08	0
5	100005	EEEM	25	28.57	35.71	10.71	0



Parameter(Average Grading)		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 career expectations	7. The course will be useful to meet your higher studies/future aspirations.
Subject Code	**Subject Name**							
150501	Discrete Structures	3.93	4	3.93	4.06	4.06	3.93	4.06
15502	Software Engineering	4.22	4.22	4	4.22	4.22	4.22	4.22
150503	Theory of Computation	4.2	4.3	4.3	4.3	4.2	4.2	4.2
150504	Microprocessor & Interfacing	3.99	4.03	4.02	3.9	3.95	3.92	4
100005	EEEM	3.75	3.75	4	3.75	3.5	3.5	3.5

Sample Size 35 UG-Second Year

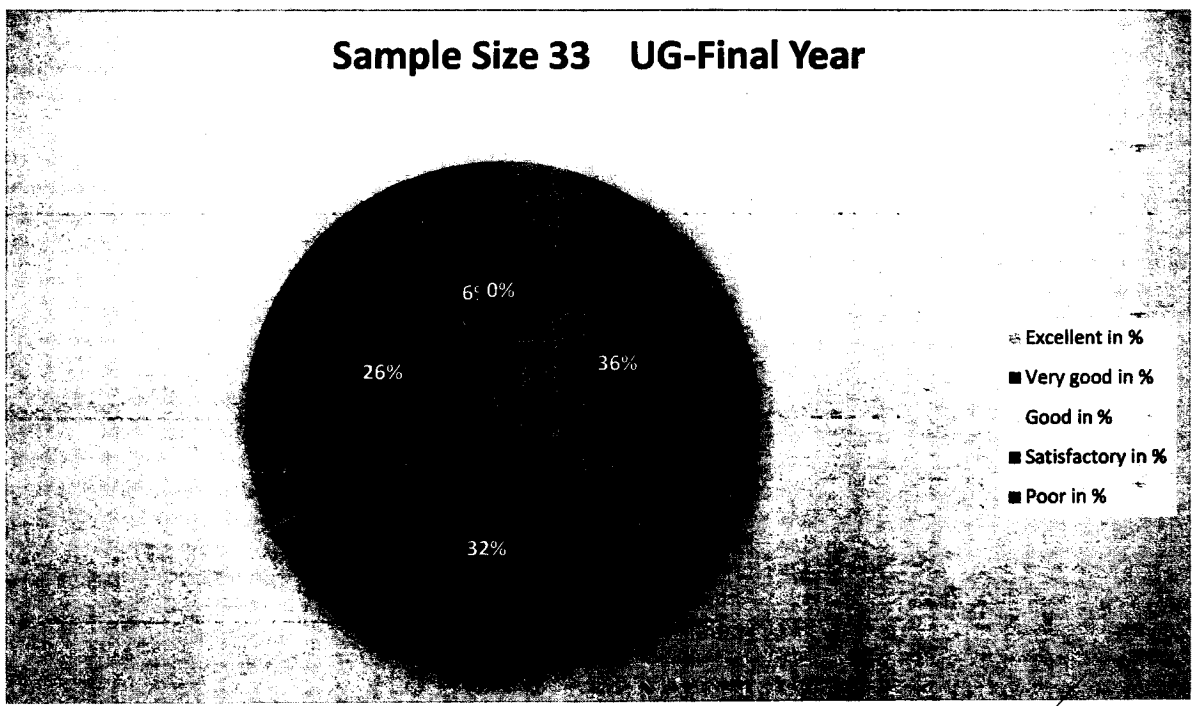


Students Comments:

Course Code and 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?
150504 Microprocessor & Interfacing	8086	RISC V	RISC cause IT IS RELAVANT TO TODAY
100005 EEEM	None	None	None

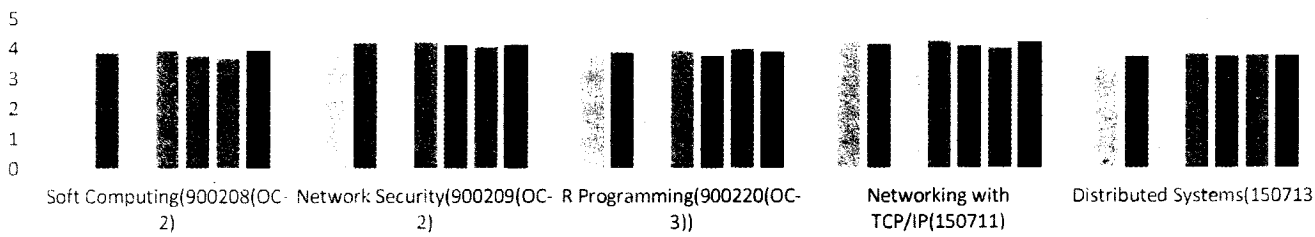
Summary Sheet -UG final Year (VII Sem)-Sample Size 33

Parameter(Average Grading)			Excellent in %	Very good in %	Good in %	Satisfactory in %	Poor in %
Sr. No	Subject Code	Subject Name					
1	900208(OC-2)	Soft Computing	34.1	29.03	25.34	10.59	0.92
2	900209(OC-2)	Network Security	40.6	37	21.1	0.8	0
3	900220(OC-3)	R Programming	37.3	25.39	26.98	9.52	0.79
4	150711	Networking with TCP/IP	37.14	44.28	18.57	0	0
5	150713	Distributed Systems	29.49	25.8	36.4	8.29	0



Parameter(Average Grading)		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 career expectations	7. The course will be useful to meet your higher studies/future aspirations.
Subject Code	Subject Name							
900208(OC-2)	Soft Computing	3.77	3.87	3.87	3.96	3.77	3.7	3.96
900209(OC-2)	Network Security	4.11	4.19	4.3	4.21	4.15	4.07	4.13
900220(OC-3)	R Programming	3.83	3.88	3.88	3.94	3.77	4	3.88
150711	Networking with TCP/IP	4.26	4.16	4.23	4.26	4.1	4.03	4.23
150713	Distributed Systems	3.54	3.74	3.87	3.83	3.77	3.8	3.77

Sample Size 33 UG-Final Year



Course Code and 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?
150711 Networking with TCP/IP	no	None	Devops
900208(OC-2) Soft Computing	civil	no one	dont know
900208(OC-2) Soft Computing	all are necessary so i dont think that any subject to be removed from the curriculam	more lectures to comp programming	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)

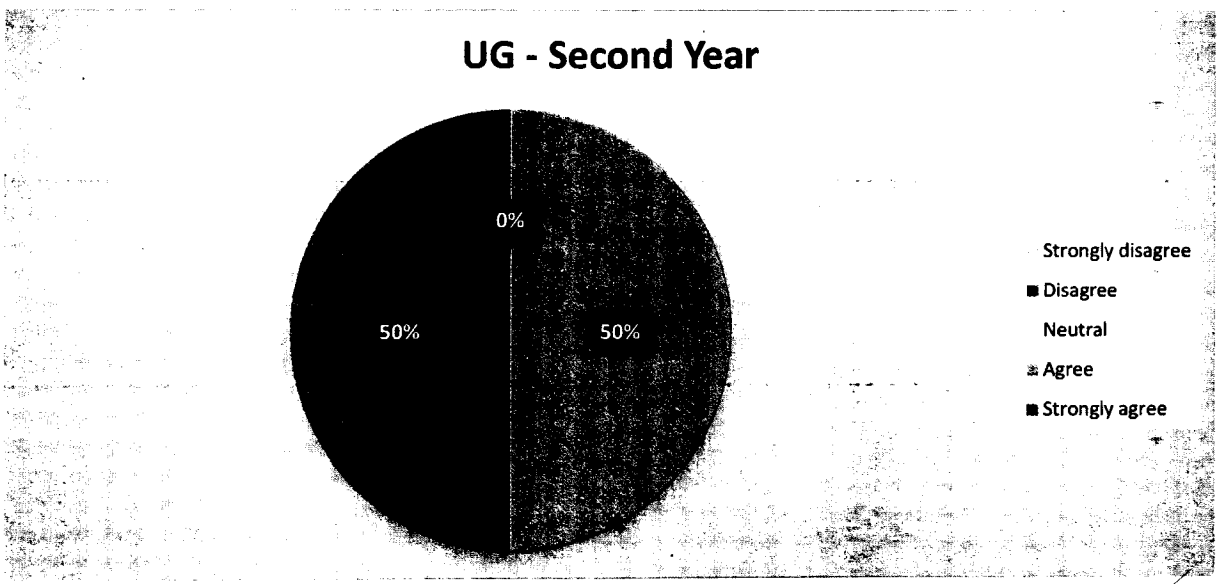
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Computer Science and Engineering

Faculty Course Curriculum Feedback Analysis (July – Dec 2021)

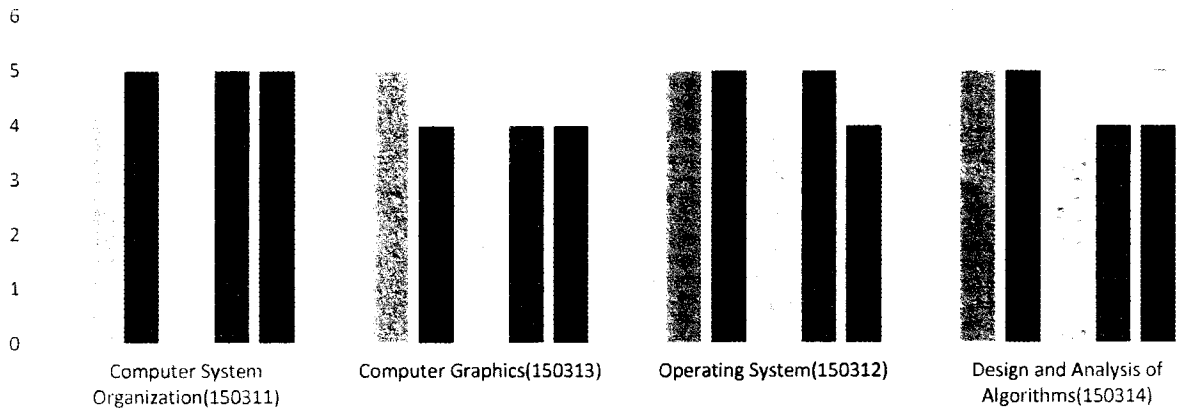
Summary Sheet -UG Second Year (III Sem)

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	0	100
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	25	75
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	100	0
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	50	50
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	75	25



Parameter(Average Grading)		1. The availability of books & E-learning material in the institute is good.	2. The Courses and content are up to date.	3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends.	4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.	5. The curriculum is capable of inculcating life-long learning abilities in students.
Subject Code	**Subject Name**					
150311	Computer System Organization	5	5	4	5	5
150313	Computer Graphics	5	4	4	4	4
150312	Operating System	5	5	4	5	4
150314	Design and Analysis of Algorithms	5	5	4	4	4

Faculty Course Curriculum Feedback(July-Dec2021)-UG Second 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?

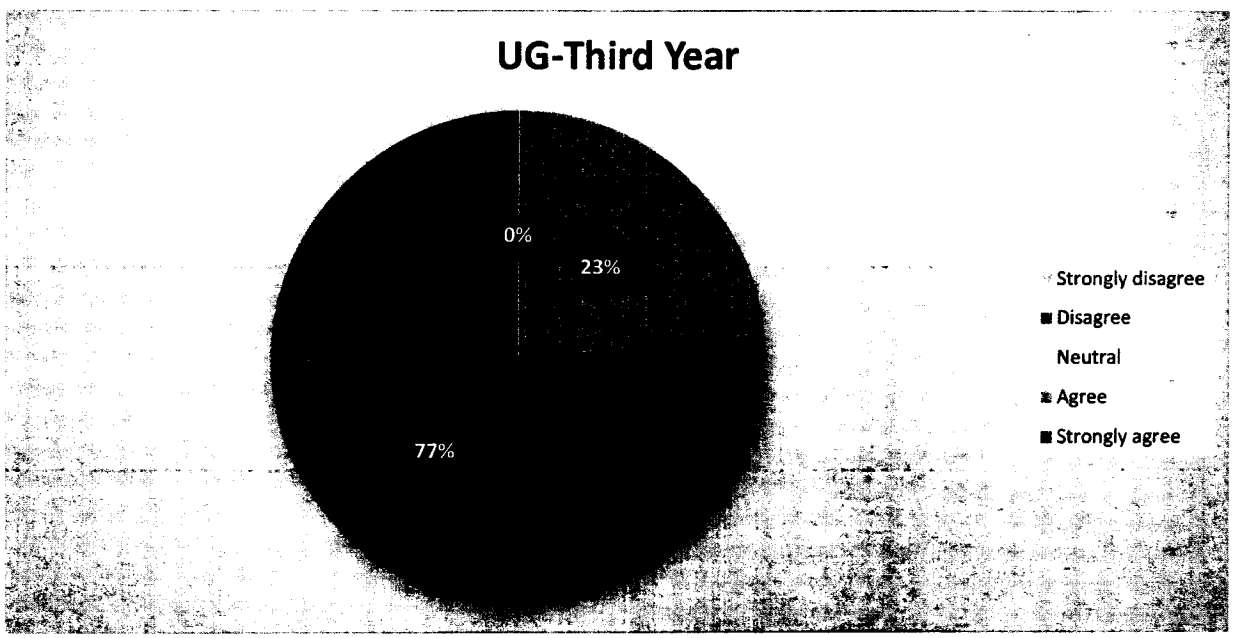
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

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)

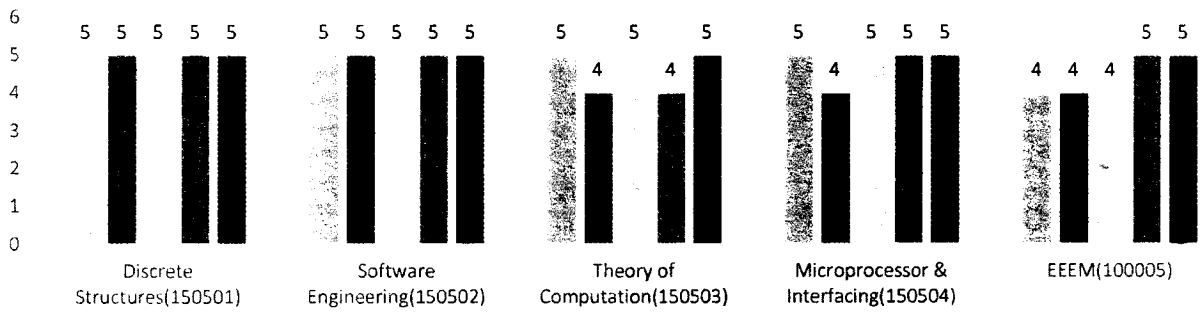
Summary Sheet-UG Third Year (V Sem)

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	17	83
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	66	33
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	17	83
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	17	83
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	0	100



Parameter(Average Grading)		1. The availability of books & E-learning material in the institute is good.	2. The Courses and content are up to date.	3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends.	4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.	5. The curriculum is capable of inculcating life-long learning abilities in students.
Subject Code	**Subject Name**					
150311	Computer System Organization	5	5	5	5	5
150313	Computer Graphics	5	5	5	5	5
150312	Operating System	5	4	5	4	5
150314	Design and Analysis of Algorithms	5	4	5	5	5

Faculty Course Curriculum Feedback(July-Dec2021)-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?

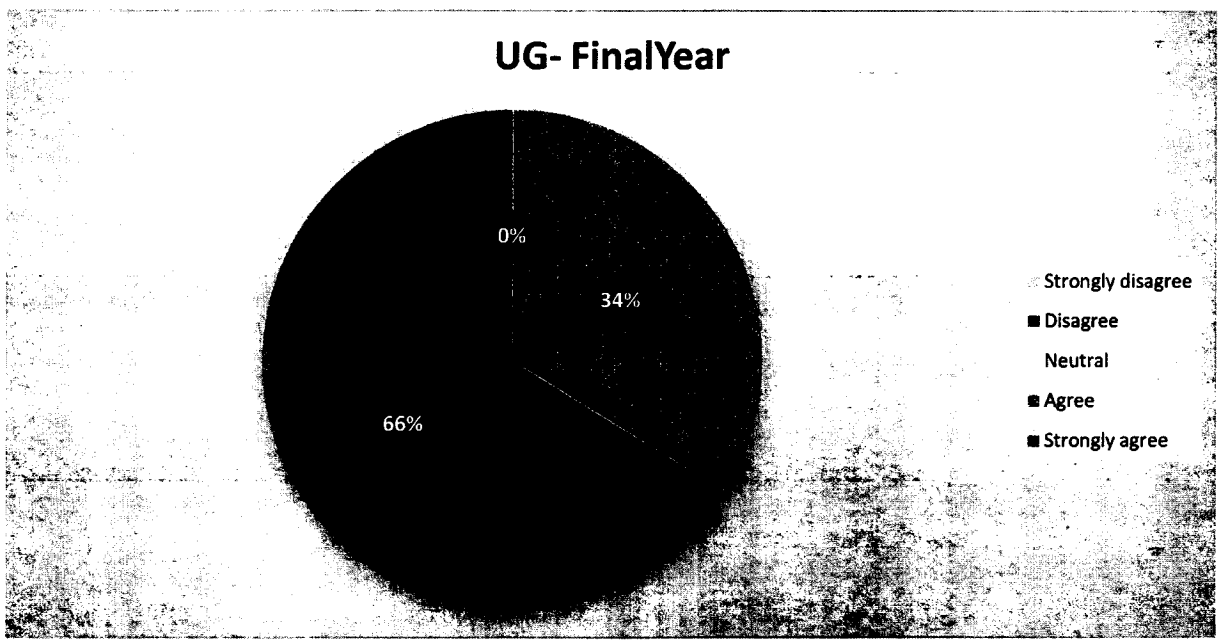
3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends. (Please give suggestions if any)

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)

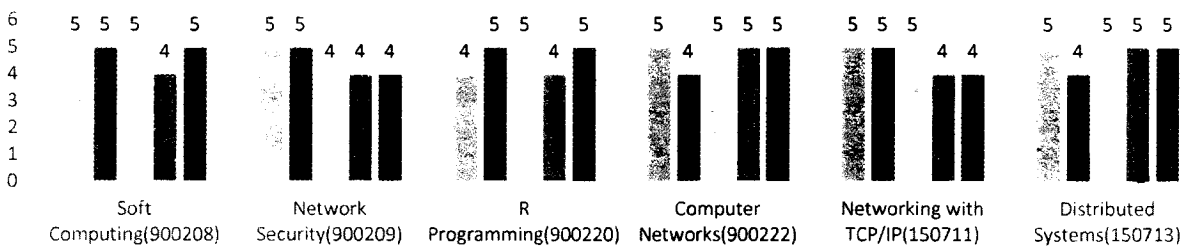
Summary Sheet-UG Final Year(VII Sem)

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	17	83
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	34	66
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	17	83
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	66	33
5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	0	0	0	34	66



Parameter(Average Grading)		1. The availability of books & E-learning material in the institute is good.	2. The Courses and content are up to date.	3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends.	4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.	5. The curriculum is capable of inculcating life-long learning abilities in students.
Subject Code	**Subject Name**					
150311	Computer System Organization	5	5	5	4	5
150313	Computer Graphics	5	5	4	4	4
150312	Operating System	4	5	5	4	5
150314	Design and Analysis of Algorithms	5	4	5	5	5

Faculty Course Curriculum Feedback(July-Dec2021)-UG Final 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 (M.P.)

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

Department of Computer Science and Engineering

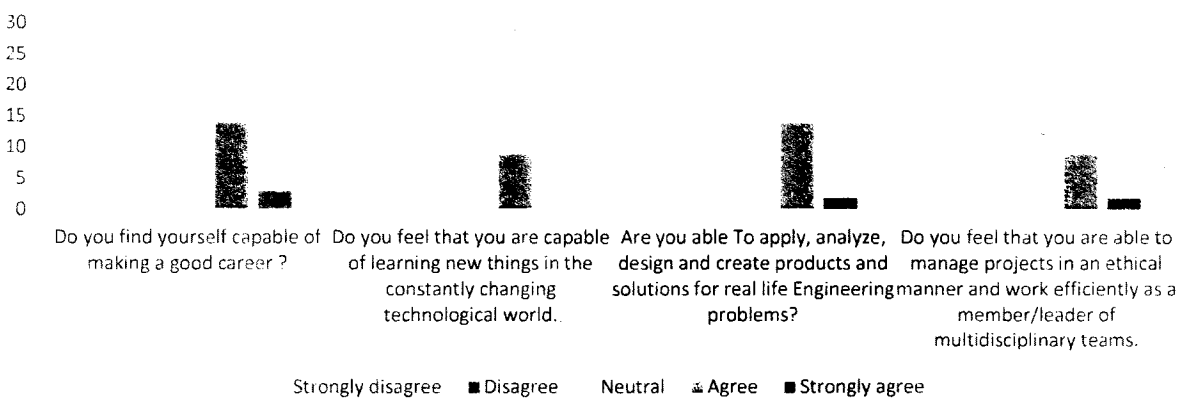
Summary Sheet (Alumni Satisfaction Survey) Sample Size:35

Curriculum Evaluation Point	Response in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you find yourself capable of making a good career ?	0	0	17	14	3
Do you feel that you are capable of learning new things in the constantly changing technological world.	0	0	25	9	0
Are you able To apply, analyze, design and create products and solutions for real life Engineering problems?	0	0	18	14	2
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	0	23	9	2

Alumni Satisfaction Index has been calculated on 5 Point Scale

(5: Strongly Agree, 4: Agree, 3: Neutral, 2: Disagree, 1: Strongly Disagree)

ALUMNI SATISFACTION SURVEY: Sample Size = 35



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)

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

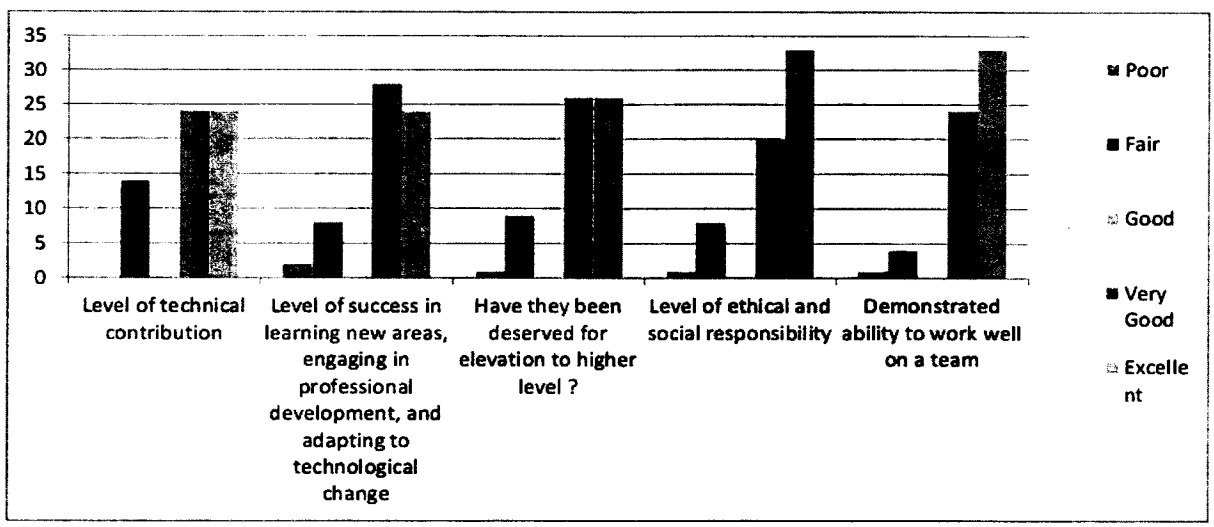
Department of Computer Science and Engineering

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 responsibility1	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)

EMPLOYER SATISFACTION SURVEY : Sample Size : 62



Annexure - XXII

Madhav Institute of Technology & Science, Gwalior
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Computer Science and Engineering

Course Outcomes (COs) Feedback Analysis July - Dec. 2021

Semester	Course Code	Course Name	Feedback Sample Size	CO Feedback Attainment (%age)		CO Feedback Attainment Level	Target	Attained/not attained	Action taken for Not Attained
III - A	150313	Computer Graphics	31	CO1	76.34	3	2	Attained	-
				CO2	76.34	3	2	Attained	-
				CO3	75.27	3	2	Attained	-
				CO4	75.27	3	2	Attained	-
				CO5	70.97	3	2	Attained	-
				CO6	66.67	2.7	2	Attained	-
III - B	150313	Computer Graphics	50	CO1	79.33	3	2	Attained	-
				CO2	82.67	3	2	Attained	-
				CO3	80.67	3	2	Attained	-
				CO4	80.67	3	2	Attained	-
				CO5	77.33	3	2	Attained	-
				CO6	78	3	2	Attained	-
III - A	150311	Computer System Organization	8	CO1	83.33	3	2	Attained	-
				CO2	70.83	3	2	Attained	-
				CO3	79.16	3	2	Attained	-
				CO4	79.16	3	2	Attained	-
				CO5	66.66	2.7	2	Attained	-
				CO6	79.16	3	2	Attained	-
III - B	150311	Computer System Organization	29	CO1	70.11	3	2.5	Attained	-
				CO2	73.56	3	2.5	Attained	-
				CO3	70.11	3	2.5	Attained	-
				CO4	68.97	2.9	2.5	Attained	-
				CO5	78.16	3	2.5	Attained	-
				CO6	71.26	3	2.5	Attained	-
				CO1	76.67	3	2	Attained	-
				CO2	66.67	2.7	2	Attained	-

Madhav Institute of Technology & Science, Gwalior
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Computer Science and Engineering

Course Outcomes (COs) Feedback Analysis July - Dec. 2021

Semester	Course Code	Course Name	Feedback Sample Size	CO Feedback Attainment (%age)		CO Feedback Attainment Level	Target	Attained/not attained	Action taken for Not Attained
III - B	150312	Operating Structures	10	CO3	80	3	2	Attained	-
				CO4	73.33	3	2	Attained	-
				CO5	73.33	3	2	Attained	-
				CO6	70	3	2	Attained	-
III - A	150312	Operating Systems	5	CO1	93.33	3	2	Attained	-
				CO2	93.33	3	2	Attained	-
				CO3	93.33	3	2	Attained	-
				CO4	93.33	3	2	Attained	-
				CO5	93.33	3	2	Attained	-
				CO6	93.33	3	2	Attained	-
V	150502	Software Engineering	30	CO1	83.33	3	2.5	Attained	-
				CO2	83.33	3	2.5	Attained	-
				CO3	80	3	2.5	Attained	-
				CO4	80	3	2.3	Attained	-
				CO5	83.33	3	2.3	Attained	-
				CO6	90	3	2.5	Attained	-
V	150501	Discrete Structures	13	CO1	71.79	3	2	Attained	-
				CO2	74.36	3	2	Attained	-
				CO3	76.92	3	2	Attained	-
				CO4	74.36	3	2	Attained	-
				CO5	74.36	3	2	Attained	-
				CO6	76.92	3	2	Attained	-
V - A	150504	Microprocessor & Interfacing	22	CO1	84.85	3	2	Attained	-
				CO2	83.33	3	2	Attained	-
				CO3	81.82	3	2	Attained	-
				CO4	86.36	3	2	Attained	-

Madhav Institute of Technology & Science, Gwalior
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Computer Science and Engineering

Course Outcomes (COs) Feedback Analysis July - Dec. 2021

Semester	Course Code	Course Name	Feedback Sample Size	CO Feedback Attainment (%age)		CO Feedback Attainment Level	Target	Attained/not attained	Action taken for Not Attained
				CO5	83.33	3	2	Attained	-
				CO6	86.36	3	2	Attained	-
V - B	150504	Microprocessor & Interfacing	17	CO1	86.27	3	2	Attained	-
				CO2	84.31	3	2	Attained	-
				CO3	80.39	3	2	Attained	-
				CO4	82.35	3	2	Attained	-
				CO5	78.43	3	2	Attained	-
				CO6	84.31	3	2	Attained	-
V	150503	Theory of Computation	12	CO1	83.33	3	2.5	Attained	-
				CO2	80.56	3	2.5	Attained	-
				CO3	83.33	3	2.5	Attained	-
				CO4	80.56	3	2.2	Attained	-
				CO5	75	3	2.2	Attained	-
				CO6	80.56	3	2.5	Attained	-
VII	150711	Networking With TCP/IP	27	CO1	77.78	3	3	Attained	-
				CO2	76.54	3	3	Attained	-
				CO3	80.25	3	3	Attained	-
				CO4	75.31	3	3	Attained	-
				CO5	72.84	3	3	Attained	-
				CO6	77.78	3	3	Attained	-
VII	900208	Soft Computing	19	CO1	70.18	3	2	Attained	-
				CO2	71.93	3	2	Attained	-
				CO3	73.68	3	2	Attained	-
				CO4	66.67	2.7	2	Attained	-
				CO5	68.42	2.8	2	Attained	-
				CO6	70.18	3	2	Attained	-

Madhav Institute of Technology & Science, Gwalior
(A Govt Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Computer Science and Engineering

Course Outcomes (COs) Feedback Analysis July - Dec. 2021

Semester	Course Code	Course Name	Feedback Sample Size	CO Feedback Attainment (%age)		CO Feedback Attainment Level	Target	Attained/not attained	Action taken for Not Attained
VII	900209	Network Security	39	CO1	85.47	3	2.5	Attained	-
				CO2	85.47	3	2.5	Attained	-
				CO3	85.47	3	2.5	Attained	-
				CO4	83.76	3	2.5	Attained	-
				CO5	84.62	3	2.5	Attained	-
				CO6	85.47	3	2.5	Attained	-
VII	150713	Distributed Systems	9	CO1	81.48	3	2.5	Attained	-
				CO2	81.48	3	2.5	Attained	-
				CO3	85.19	3	2.5	Attained	-
				CO4	81.48	3	2.5	Attained	-
				CO5	81.48	3	2.5	Attained	-
				CO6	77.78	3	2.5	Attained	-

Attainment Levels	Excellent (3)	Very Good (2)	Good (1)
	70%	60%	50%

Annexure – XXIII

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	Maximum Marks Allotted							Total Marks	Contact Periods per week			Total Credits
			Theory Slot			Practical Slot		MOOC's						
			End. Sem.	Mid Sem.	Quiz/ Assignment	End Sem.	LabWork/ sessional	Assignment	Exam		L	T	P	
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	-	-	-	-	-	25	75	100	3	-	-	3
5	OC	Open Category Course(OC-2)	-	-	-	-	-	25	75	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 SWAYAM/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 SWAYAM/NPTEL based platform(with credit transfer facility)and accordingly, OC-2 pool may be created from the list of SWAYAM/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 SWAYAM/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	
620216	Cloud Computing
620218	Social Networks
OC-2	
800204	Introduction to Internet of Things
800205	Deep Learning

Annexure XXIV

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

Date: 20 Dec 2021

Student Feedback on Curriculum Action Taken Report

A meeting of faculty was held for analyzing Course curriculum feedback given by the students. For the continuous improvement in the teaching-learning process, the feedback was discussed with all concerned faculty member one by one. Also, on the basis of suggestions received in Feedback, some corrective actions have been suggested to the concerned faculty, which are as follows:

1) New subject Hardware Security is introducing as DE-5.
2) Concerned faculty has been instructed to upload all the learning materiel on the MOODLE prior to the topic discussed in the class.
3) Employability focused new subjects are introduced in the curriculum.

Dr. Manish Dixit
Professor & HOD

Dr. Manish Dixit
Professor & HOD
Department of CSE
M.I.T.S. Gwalior

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

Date 20 Dec 2021

Faculty Feedback on Curriculum Action Taken Report

A meeting of faculty was held for analyzing Course Curriculum feedback given by the faculty. For the continuous improvement in the teaching-learning process, the feedback was discussed with all concerned faculty one by one. Also, on the basis of suggestions received in Feedback, some corrective actions have been suggested to the concerned faculty, which are as follows.

1. Course committee is constituted to regularly analyze and modify the Syllabus and course outcomes as per the suggestions.
2. New courses will be introduced in emerging technologies.

Dr. Manish Dixit
Professor and Head

Dr. Manish Dixit
Professor & HOD
Department of CSE
M.I.T.S. Gwalior

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

Date: 20 Dec 2021

Action Taken Report on Alumni Satisfaction Survey

A meeting of alumni coordinators was held in the department for analyzing Alumni satisfaction survey. For the continuous improvement in the teaching-learning process, the feedback was discussed. Also, on the basis of suggestions received in survey, some corrective actions have been suggested, which are as follows:

1. Alumni Coordinators are instructed to conduct meetings with the alumni to gather the suggestions on regular basis, so that timely action can be taken for the betterment of the institute.
2. To explore new career and internship opportunities for the students of department, regular student-alumni interaction will be conducted.
3. Also, an alumni has been planned to be conducted in the month of February.

Dr. Manish Dixit
Professor and Head

Dr. Manish Dixit
Professor & HOD
Department of CSE
M.I.T.S. Gwalior

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Computer Science and Engineering

Date: 20 Dec 2021

Action Taken Report on Employer Feedback

A meeting of BoS Coordinators was held in the department for analyzing employer feedback Also, on the basis of suggestions received in Feedback, some corrective actions have been suggested which are as follows:

1) It is observed that, on the scale of 5. Employer gave 4 (very good) feedback for most of the feedback criteria's.
2) In the criteria "Level of technical contribution" employer gave 3 (good) feedbacks. For the improvement following measures are introduced in the curriculum:
   A. Provision of internship has been introduced under flexible curriculum.
   B. To improve technical knowledge, various MOOC courses are introduced.

Dr. Manish Dixit
Professor and Head

Dr. Manish Dixit
Professor & Head
Department of CSE
M.I.T.S.

Annexure-XXV

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Computer Science and Engineering

STUDENTS COURSE CURRICULUM FEEDBACK (by Faculty on MOODLE) July- Dec 2021

Sr. No.	Faculty Name	Subject Code	Subject Name	Semester	Section	Responces Link
1	Dr. Anjula Mehto	150311	COMPUTER SYSTEM OR	III	B	https://drive.google.com/drive/folders/1f1fjbsfILwFmlGDzNKj8cUmbQLVa6OHNl_X_cPy56SCWdSb0q6fIQhE0CUp2lY_wjGrRiRSK
2	Dr. Rajni Ranjan Singh	150312	Operating Structures	III	B	
3	Dr. Rajni Ranjan Singh	150312	Operating Systems	III	A	
4	Dr. Manish Dixit	150313	Computer Graphics	III	A	
5	Prof. Hemlata Arya	150313	Computer Graphics	III	B	
6	ankita sengar	150501	Discrete structures	V	A	
7	Mir Shahnawaz Ahmad	150502	Software Engineering	V	A+B	
8	Kratika Sharma	150504	Microprocessor & Interfaci	V	A	
9	Kratika Sharma	150504	Microprocessor & Interfaci	V	B	
10	Khushboo Agarwal	150711	Networking with TCP/IP	VII	DE-3	
11	Dr. Anjula Mehto	150713	Distributed Systems	VII	A+B	
12	Jaimala Jha	900208	Soft Computing	VII	A+B	
13	AMIT KUMAR MANJHVAR	900209	NETWORK SECURITY	VII	A+B	
14	Arun Kumar	900220	R Programming	VII	A+B	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Computer Science and Engineering

FACULTY COURSE CURRICULUM FEEDBACK (by Faculty on MOODLE) July- Dec 2021

Parameter(Average Grading)						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 change	5. The curriculum is capable of inculcating life-long learning abilities in students. (Any suggestions, please give below)	6. The environment of department/institute is conducive for innovative teaching and research. (Please comment)	7. The institute supports you in your initiatives for updating your knowledge/skills and in achieving career growth. (Please comment)	8. The institute provides basic infrastructural facilities required for teaching learning. (Please comment)	9. You get academic freedom to implement your ideas and conduct your courses without interference from	10. 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:
Sr. No	Faculty Name	Subject Code	Subject Name	Semester	Section														
1	Dr. Anjula Mehto	150311	CSO	III	B	5	4	5	5	5	Yes	yes	Internet fa	Yes	Yes	Nil	Nil	Nil	Nil
2	Dr. Manish Dixit	150313	Computer Graphics	III	A	5	4	4	4	4	Yes	Yes	Yes	Yes, thro	Yes	Cyber Physical System			
3	Hemlata Arya	150313	Computer Graphics	III	B	5	5	5	5	5	Yes envir	Yes	No	No	Yes	Nil	Nil	Nil	Nil
4	Lav Upadhyay	150314	Design and Analysis of Algorithms	III	B	5	5	5	5	5									
5	Aishwarya	150314	Design and Analysis of Algorithms	III	A	5	5	4	4	4									
6	Ankita Sengar	150501	Discrete Structures	V	A	5	5	5	5	5	yes	yes	yes	yes	yes				
7	Mir Shahnawaz Ahmad	150503	Software Engineering	V	A+B	5	5	5	5	5									
8	Mahesh Parmar	150503	Theory of Computation	V	A	5	4	5	4	5	yes	yes	yes	yes	yes	Nil	Nil	Nil	Nil
9	Khushboo Agrawal	150711	Networking with TCP/IP	VII	A+B	5	5	5	4	4	yes	yes	yes	yes	yes				
10	Dr. R. K. Gupta	150712	Data mining & Warehousing	VII	A+B	4	5	4	4	4									
11	Dr. Anjula Mehto	150713	Distributed Systems	VII	A+B	5	5	4	5	5	Yes	Yes		Yes	Yes	Nil	Nil	Nil	Nil
12	Jaimala Jha	900208(OC-2	Soft Computing	VII	A+B	4	4	4	4	4	yes	yes	yes	yes	yes	Nil	Nil	Nil	Nil
13	Arun Kumar(R Programming	900220(OC-3)	R Programming	VII	A+B	4	5	5	4	5									

ameter Average Grading (on a scale of 5) (5: Excellent, 4: Very Good, 3: Good, 2: Satisfactory , 1: Pc

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Alumni Satisfaction Survey Responces

Sr. No.	Name	Email Id	Mobile No.	Current Address	Present Status / Designation	Company Name	Do you find yourself capable of making a good career ?	Do you feel that you are capable of learning new things in the constantly changing technological world.	Are you able To apply, analyze, design and create products and solutions for real life Engineering problems?	Do you feel that you are able to manage projects in an ethical manner and work efficiently as a member/leader of multidisciplinary teams.
1	Charu Singh	charu20.1995@gmail.com	9039587542	E star -7, Jaypee Nagar, Rewa (M.P.)	Application Development Senior Analyst	Accenture	5	5	5	5
2	Mayank Shukla	mayankshukla739@gmail.com	9752895025	238, madhuban colony dewas	Application Development Analyst	ACCENTURE	5	5	5	5
3	Amisha Garg	ami25797@gmail.com	9479677186	C-103 Nehru Residency Nehru Colony, Thatipur, Gwalior	Software Engineer	Teksystems Global Service	5	5	5	5
4	Priyanka Seriwala	seriwalapriyanka97@gmail.com	8349527731	21,Tulsi State Nearby Saraswati Shishu Mandir Aanand Nagar Khandwa Madhya Pradesh, 450001	Data Engineer	IBM India Pvt Ltd	5	5	5	5
5	Rajkumar Lodhi	rajkumarlodhi39@gmail.com	7697718734	Ashok Nagar	Web Developer	P andP Infotech	3	4	4	4
6	Akshita Kharbanda	meghakharbanda18@gmail.com	9981114058	Bhopal, MP	Team lead	Joveo	5	5	5	5

7	Jatin Parashar	jatinparashar2@gmail.com	8602586814	House no 201 haat road guna	Student		3	4	3	3
8	Shubha Pankaj	spankajgwl@gmail.com	9347996589	Air force station Gorakhpur	Software developer	Philips	4	5	5	4
9	Rahul Katariya	rahulkatariya273@gmail.com	9.19E+11	Vijay Nagar Shajapur	Software Engineer	TCS	4	4	4	4
10	Ayush kumar jain	ayushjain0023@gmail.com	9407280994	C1 shubhalaya pearl near nikhil homes phase 3 hoshangabad road bhopal	Senior Software Engineer	Mindtree	4	5	4	5
11	Trisha Datta	dattatrisha02@gmail.com	9755600926	C-16 Ashok Vihar Colony, Tansen Road, Gwalior, M.P.	Software Engineer 2	Dell Technologies	4	5	4	5
12	Satyam Raghuwanshi	raghuwanshisatyam46@gmail.com	8109409730	Ganj Basoda	Software Engineer	Newgen Software Technologies Limited	4	4	4	4
13	Akash Patel	ap69670@gmail.com	8878993532	Pune	Software Developer	Kredx	4	5	4	5
14	Priyanka Setiya	priyankasetiya4@gmail.com	7999187557	203,Dhanwant Plaza,Gwalior	System Engineer	Tata Consultancy Services	5	5	5	5
15	RAVI KUMAR SINGH	ravi9610155875@gnail.com	8269526307	Hno 153, vill Lodha, Aligarh	Researcher	TCS Research	4	5	4	4
16	Amiya Tripathi	amiyatripathi786@gmail.com	9827120957	Rewa MP	SDE	Amazon	4	4	4	4
17	PRANJAL GUPTA	pranjalguptagwl@gmail.com	8989021150	291, Jiwaji Nagar Thatipur Gwalior	Software Development Engineer	Amazon	4	4	4	4
18	Amit Raghuwanshi	amitraghuwanshi330@gmail.com	8602678893		Assistant Software Engineer	Center for Railway Information System	5	5	4	4

19	deepansh940@gmail.com	deepansh940@gmail.com	9109508408	Dubey Colony, Guna MP	Full Stack Engineer	X Team	5	5	5	5
20	Shruti Trivedi	shruti3.trivedi@gmail.com			Software Engineer		4	4	4	4
21	Anshita Shrivastava	anshita.shri.29@gmail.com	9.20E+11	B-21, Surendra estate, chuna bhatti, kolar road bhopal madhya pradesh 462016	Application development analyst	Accenture	4	5	5	5
22	AVI KAUSHIK	avikaushik96@gmail.com	9827222500	AM-80, Deen Dayal Nagar, Gwalior	Software Developer	Accenture	5	5	5	5
23	Akash Dev Singh	akashdev47@gmail.com	9685888597	Near CMIT college, North karundiya, Vivekanand nagar, sidhi, M. P. 486661	Business Technology Analyst	ZS Associates	4	5	4	5
24	Rashi Agrawal	rashi.agrawal.2101@gmail.com	9689499004	57, M.P. Nagar, Gwalior	Engineer	Qualcomm	5	5	5	5
25	Sakshi Vyas	sakshi2401vy@gmail.com	9977023456	302 Shivalik Apartment behind Sita manor hotel gandhi road gwalior	Solutions Engineer	NetApp	5	5	5	5
26	Smriti Bajaj	smritibajaj22@gmail.com			Student	Northeastern university, Boston, MA, USA	4	5	5	5
27	Rashi Agrawal	rashi.agrawal.2101@gmail.com	9689499004	57, M.P. Nagar, Gwalior	Engineer	Qualcomm	5	5	5	5

28	Prakhar Agrawal	sunshineprakhar@gmail.com	9713859248	3321 new patel nagar orai jalaun	Student/M tech	IIIT ALLAHABAD	5	5	5	5
29	Nidhi Singh	nidhi.singh.1808@gmail.com			Student	IIM Kozhikode	4	4	5	5
30	Ankur Dohare	ansdohare@gmail.com	7566600076	Pragati Nagar Nanakheda Ujjain	Software Engineer	Accenture	3	4	3	3
31	Apoorva Shivhare	apoorvashivhare.iift1820@gmail.com	9.20E+11		Consultant	Deloitte	5	5	4	5
32	Vivek Khandelwal	vivekkhandelwal1424@gmail.com	7879835123		Machine Learning Compiler Engineer	Qualcomm	5	5	5	5
33	Deeksha Jadon	deeksha jadon	8269366520	ward 16, sawaliya colony, sunhera road, sabalgarh 476229	Higher studies		5	5	4	5
34	Armaan Gupta	armaangupta616@gmail.com	7389580692	Gwalior	Student	College - XLRI	5	5	5	5

Annexure – XXVI

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.

Annexure – XXVII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute affiliated to RGPV, Bhopal)

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, Prime Implicants and Essential Prime Implicants definition.

Unit-III

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

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.

Annexure-XXVIII

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Lecture Plan

Department: Computer Science & Engineering

Semester: 2nd | **Subject: Digital Electronics** | **Sub Code: 150213 (DC-3)**

Lecture	Unit	Topics
L-1	1	Introduction to Digital Electronics, Needs and Significance
L-2		Different Number System: Binary Numbers
L-3		Octal and Hexadecimal Numbers
L-4		Conversions
L-5		Complement's
L-6		Signed Binary Numbers
L-7		Binary Arithmetic's
L-8		Binary Codes: BCD, ASCII Codes
L-9	2	Basic Theorems and Properties of Boolean Algebra
L-10		Boolean Functions
L-11		Boolean Relations
L-12		Digital Logic Gates
L-13		De Morgan's theorems
L-14		Karnaugh Map (K-Map) and Simplifications
L-15		Prime Implicants and Essential Prime Implicants definition
L-16	3	Combinational circuit-Half Adder, Half-Subtractor
L-17		Full adder, Full-Subtractor
L-18		Binary Adder, Binary Subtractor
L-19		Binary Multiplier
L-20		Comparator
L-21		Decoders, Encoders
L-22		Multiplexers, De-multiplexer
L-23	4	Sequential Circuits, Latches,
L-24		Flip-Flops: RS Latches,
L-25		Level Clocking, D Latches
L-26		Edge- triggered D Flip-flop
L-27		Edge-triggered JK Flip-flop
L-28		JK Master-slave Flip-flop
L-29		Registers, Shift Registers
L-30		Counters, Ripple Counters
L-31		Synchronous Counters
L-32		Introduction to Memory, Memory Decoding
L-33		Error Detection
L-34		Error Correction

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Lecture Plan

L-35	5	Programmable Logic Array, Programmable Array Logic
L-36		Sequential Programmable Devices
L-37		RTL and DTL Circuits,
L-38		TTL, ECL
L-39		MOS, CMOS,
L-40		Application Specific Integrated Circuits

Total change in syllabus=2 /40 * 100

= 5% change in syllabus