



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade
Gola Ka Mandir, Gwalior (M.P.)- 474005, INDIA

Ph.: +91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



Department of Computer Science and Engineering

D-20580

06/02/2025

**Department
of
Computer Science and Engineering**

Agenda & Minutes

Of

The BOS Meeting

CSE/CSD/M.Tech.

BOS meeting

Conducted on 06th Dec 2024



Department of Computer Science and Engineering

Minutes of Meeting of Board of Studies

The Meeting of Board of Studies (BoS) in Computer Science & Engineering was held on 06 Dec 2024 **through Hybrid Mode**. 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. Shekher Verma, Professor IIIT, Allahbad	External Member (Academics) AC Nominee
4.	Dr. K.V Arya, Professor, IIITM Gwalior	External Member (Academics) AC Nominee
5.	Ms Ruby Malhotra, Co-Founder & Executive Director, Kailtech Test & Research Centre Pvt Ltd, Indore,	representative from industry/
6.	Ravikant Sharma, Assistant Vice President Citi Bank Singapore	Alumnus
7.	Dr. R. K. Gupta, Professor	Member
8.	Ms. Jaimala Jha, Assistant Professor	Member
9.	Mr. Mahesh Parmar, Assistant Professor	Member
10.	Mr. Amit Kumar Manjhar, Assistant Professor	Member
11.	Dr. Ranjeet Kumar Singh	Member
12.	Ms. Smita Parte, Assistant Professor	Member
13.	Dr. Kuldeep Naryan Tripathi	Member
14.	Dr. Rohit Agrawal	Member
15.	Dr. Gagandeep Kaur	Member
16.	Dr. Rahul Dubey	Member
17.	Dr. Dheeraj Dixit	Member
18.	Dr. Nishant Jain	Member
19.	Dr. Praphula Kumar Jain	Member
20.	Dr. R. S. Jadon, Professor (Computer Application)	Member
21.	Dr. Anshu Chaturvedi, Professor (Computer Application)	Member
22.	Dr. Parul Saxena, Asst Professor (Computer Application)	Member



Agenda of the BoS Meeting

(BoS Meeting Scheduled to be held 10th December 2024)

Instructions for preparing BoS Proceedings

(All information is to be uploaded on the webpage under suitable heading (such as Board of Studies) and separate links to be provided for each category mentioned below)

Minutes should have a summary/cover page mentioning all the significant changes made in the following format :

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 Image Processing	2150601	Dec 22	Dec 24	10	6	5	
Machine Learning	2150602	Dec 22	Dec 24	10	6	5	
IOT System Design	2290601	Dec 23	Dec 24	60	6	5	
Artificial Intelligence & Machine Learning	2290602	Dec 23	Dec 24	10	6	5	
Computer Networks	3150401	Dec 21	Dec 24	10	10	6	
Data Mining & Warehousing	3150403	Dec 22	Dec 24	20	10	6	
Theory of Computation	3150404	Dec 21	Dec 24	10	10	6	
Web Technologies	3290401	Dec 22	Dec 24	10	10	6	
Microprocessor Design & Interfacing	3290402	Dec 23	Dec 24	10	10	6	
Theory of Computation	3290404	Dec 22	Dec 24	10	10	6	
Computer Networks	3290405	Dec 22	Dec 24	10	10	6	

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
Artificial Intelligence & Neural Network	3150406	Knowledge Representation; Game playing, Definition and importance of Knowledge, Models of Neuron; McCulloch-Pitts Model, Hebb Net, Feedback Networks	10	6	

Feedback on curriculum received from stakeholders: Analysis & ATR*

Stakeholder	Student	Faculty	Alumni	Employer
-------------	---------	---------	--------	----------

Computer Science and Engineering

1

06 DEC 2024

Recommended in the BoS meeting of CSE held on 06/12/2024

(Handwritten signatures and initials)



No. of responses	583	28	22	73
Link of Analysis	<VIEW>	<VIEW>	<view>	<VIEW>
ATR Link	<VIEW>	<VIEW>	<view>	<VIEW>
Link showing Excel sheet of Google Form details of stakeholders	moodle	Moodle	<view>	<VIEW>

* Separate page(s) for each of the above four points; Agenda point wise minutes to be appended with each point and a separate link to be given in the appropriate column for each point

2. The BoS minutes along with the cover/summary page (under point number 1, above) must be uploaded on the departmental web page and link for the same must be shared with the office of the Dean Faculty of Engg & Technology.

The following must be uploaded on the departmental web page and link for the same must be shared with the office of the Dean Academics.

- *The Stakeholder feedback collected & analyzed to find the index out of five
- * Action Taken Report on each feedback

*The details/data of the stakeholder responded through Google form showing responses from alumni, employer, student, faculty etc must also be shared with the office of the Dean Academics.

4. Minutes should have footer with department name, page number, and month of meeting.

5. Each page should be signed by all faculty, scanned and then submitted to the office of the Dean Faculty of Engg & Technology.

BoS Agenda Items

Item 1	To confirm the minutes of previous BoS meeting held in the month of May-June 2024. <i>Minutes of the last BoS held on 04 June 2024 are confirmed by the house.</i>
Item 2	To propose the scheme structure of VIII Semester with the provision of ONE DE & ONE OC course to be offered in online mode with credit transfer for the batch admitted in academic year 2021-22. (The total credits from I-VIII semester should not be less than 160 for this batch). The scheme for B.Tech VIII Semester, CSE and CSD discipline were discussed and finalized. The Scheme of CSE VIII semester is enclosed in <u>Annexure-1</u> The Scheme of CSD VIII semester is enclosed in <u>Annexure-2</u>
Item 3	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 courses (DE-5) and open category (OC3) for credit transfer in the VIII Semester under the flexible curriculum (Batch admitted in academic year 2021-22) The list of Departmental Elective (DE-5) and open category (OC3) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VIII Semester, CSE and CSD discipline (under flexible curriculum) were discussed and finalized, as per the following

Computer Science and Engineering

2

06 DEC 2024

Recommended in the BoS meeting of CSE held on 06/12/2024

[Handwritten signatures and initials]



detail.

DE-5* (CSE)		
S. No.	Subject Code	Subject Name
1.	150871	Natural Language Processing noc25-cs51
2.	150872	Blockchain and its Applications noc25-cs08
3.	150863	Selected Topics in Algorithms noc25-cs64
DE-5* (CSD)		
S. No.	Subject Code	Subject Name
1.	290811	GPU Architectures and Programming noc25-cs37
2.	290812	Deep Learning - IIT Ropar noc25-cs21
3.	290813	Selected Topics in Algorithms noc25-cs64
CC-3*		
S. No.	Subject Code	Subject Name
1.		Affective Computing noc25-cs04
2.		Cloud Computing noc25-cs11
3.		Compiler Design noc25-cs13

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 B.Tech. VII semester students (for the batch admitted in 2021-22) and for B.Tech. V semester (for the batch admitted in 2022-23)

Item 4

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

*honours (SWAYAM/NPTEL/ MOOC platform)

Computer Science and Engineering

3

06 DEC 2024

Recommended in the BoS meeting of CSE held on 06/12/2024



Track1-Information Security

1. Cryptography and Network Security
2. Quantum Algorithms and Cryptography

Track 2-IoT

1. Foundation of Cloud IoT Edge ML
2. Design and Engineering of Computer Systems

Track 3- High Performance Computing

1. Edge Computing
2. Embedded System Design with ARM

2) Courses for "Minor Specialization" VIII Semester

*Minor (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)	
1	Advanced Computer Networks noc25-cs02
2	Data Mining noc25-cs19
3	Getting Started with Competitive Programming noc25-cs36

Courses for "Honours"- VI Semester

*honours (SWAYAM/NPTEL/ MOOC platform)	
Track1-Information Security 1. Foundations of Cryptography noc25-cs31 2. Secure Computation: Part I noc25-cs63	
Track 2-IoT 1. Introduction To Industry 4.0 And Industrial Internet Of Things noc25-cs43 2. Wireless Ad Hoc and Sensor Networks noc25-cs74	
Track 3- High Performance Computing 1. Parallel Computer Architecture noc25-cs54	

Computer Science and Engineering

4

06 DEC 2024

Recommended in the BoS meeting of CSE held on 06/12/2024



	2. Linear programming and its applications to computer science noc25-cs77 Courses for "Minor Specialization" - VI semester <table border="1"> <tr> <th colspan="2">*Minor (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)</th></tr> <tr> <td>1</td><td>Programming in Modern C++ noc25-cs58</td></tr> <tr> <td>2</td><td>Introduction To Internet Of Things noc25-cs44</td></tr> </table>	*Minor (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)		1	Programming in Modern C++ noc25-cs58	2	Introduction To Internet Of Things noc25-cs44
*Minor (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)							
1	Programming in Modern C++ noc25-cs58						
2	Introduction To Internet Of Things noc25-cs44						
Item 5	To review and finalize the scheme structure of B.Tech VI Semester under the flexible curriculum (Batch admitted in 2022-23) The scheme for B.Tech. VI Semester, CSE & CSD discipline under flexible curriculum curriculum (Batch admitted in 2022-23) were discussed and finalized. The Scheme of CSE VI semester is enclosed in <u>Annexure- 3</u> The Scheme of CSD VI semester is enclosed in <u>Annexure- 4</u>						
Item 6	To review & finalize the syllabi for all Departmental Core Courses (DC) of B. Tech VI Semester (for batch admitted in 2022-23) under the flexible curriculum along with their COs. The syllabi for all Departmental Core Courses (DC) for B.Tech VI Semester, CSE & CSD discipline (under flexible curriculum) were discussed and finalized. The Syllabi of CSE VI semester is enclosed in <u>Annexure- 5</u> The Syllabi of CSD VI semester is enclosed in <u>Annexure-6</u>						
Item 7	To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered for batches admitted in 2022-23 in online mode under Departmental Elective (DE) Course with credit transfer, in the VI Semester. The list of Departmental Elective courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VI Semester, CSE and CSD discipline (under flexible curriculum) were discussed and finalized, as per the following detail.						

Computer Science and Engineering

Recommended in the BoS meeting of CSE held on 06/12/2024

05 DEC 2024

(Handwritten signatures and initials)



DE-1* (CSE)

S. No.	Subject Code	Subject Name
1.	2150611	User-centric Computing For Human-Computer
2.	2150612	Games and Information noc25-cs35
3.	2150613	Getting Started with Competitive Programming noc25-cs36
DE-1* (CSD)		
S. No.	Subject Code	Subject Name
1.	2290611	Reinforcement Learning noc25-cs62
2.	2290612	Digital Design with Verilog noc25-cs25
3.	290613	Getting Started with Competitive Programming noc25-cs36

To review and finalize the courses & syllabi to be offered (for batch admitted in 2022-23) under the **Open Category (OC) Courses to be offered in traditional mode for B Tech VI semester** of other departments along with their COs.

Item 8 open category (OC1) courses to be offered for B.Tech VI Semester of other departments were discussed and finalized.

OC-1	
1.	Operating Systems
2.	Data Base Management System

Syllabi is enclosed in **Annexure- 7**

To review and finalize the **Experiment list/ Lab manual/Skill based mini-project** for all the Laboratory Courses to be offered in **B.Tech.VI semester(for batch admitted in 2022-23)**.

The Experiment list/ Lab manual/Skill based mini-project for all the Laboratory Courses to be offered in B.Tech.VI semester(for batch admitted in 2022-23) were discussed and finalized.

Item 9

Experiment list/ Lab manual/Skill based mini-project of CSE VI semester is enclosed in **Annexure- 8**

Experiment list/ Lab manual/Skill based mini-project of CSD VI semester is enclosed in **Annexure- 9**

(Handwritten signatures and initials)



DE-1* (CSE)

S. No.	Subject Code	Subject Name
1.	2150611	User-centric Computing For Human-Computer
2.	2150612	Games and Information noc25-cs35
3.	2150613	Getting Started with Competitive Programming noc25-cs36
DE-1* (CSD)		
S. No.	Subject Code	Subject Name
1.	2290611	Reinforcement Learning noc25-cs62
2.	2290612	Digital Design with Verilog noc25-cs25
3.	290613	Getting Started with Competitive Programming noc25-cs36

Item 8

To review and finalize the courses & syllabi to be offered (for batch admitted in 2022-23) under the **Open Category (OC) Courses to be offered in traditional mode for B Tech VI semester** of other departments along with their COs.

open category (OC1) courses to be offered for B.Tech VI Semester of other departments were discussed and finalized.

OC-1	
1.	Operating Systems
2.	Data Base Management System

Syllabi is enclosed in **Annexure-7**

Item 9

To review and finalize the **Experiment list/ Lab manual/Skill based mini-project** for all the Laboratory Courses to be offered in **B.Tech.VI semester**(for batch admitted in 2022-23).

The **Experiment list/ Lab manual/Skill based mini-project** for all the Laboratory Courses to be offered in **B.Tech.VI semester**(for batch admitted in 2022-23) were discussed and finalized.

Experiment list/ Lab manual/Skill based mini-project of CSE VI semester is enclosed in **Annexure-8**
Experiment list/ Lab manual/Skill based mini-project of CSD VI semester is enclosed in **Annexure-9**

Computer Science and Engineering

6

06 DEC 2024

Recommended in the BoS meeting of CSE held on 06/12/2024



Item 10	To review and finalize the scheme structure of B. Tech. IV Semester under the flexible curriculum (for batch admitted in 2023-24) The scheme for B.Tech. IV Semester, CSE & CSD discipline under flexible curriculum curriculum (Batch admitted in 2023-24)were discussed and finalized. The Scheme of CSE IV semester is enclosed in <u>Annexure- 10</u> The Scheme of CSD IV semester is enclosed in <u>Annexure- 11</u>							
Item 11	To review and finalize the syllabi for all Departmental Core (DC) Courses of B. Tech. IV Semester (for batch admitted in 2023-24) under the flexible curriculum along with their Cos The syllabi for all Departmental Core Courses (DC) for B.Tech IV Semester, CSE & CSD discipline (under flexible curriculum) were discussed and finalized. The Syllabi of CSE IV semester is enclosed in <u>Annexure- 12</u> The Syllabi of CSD IV semester is enclosed in <u>Annexure-13</u>							
Item 12	To review and finalize the Experiment list/ Lab manual/Skill based mini-project for all the Laboratory Courses to be offered in Batch IV semester (for batch admitted in 2022-23) The Experiment list/ Lab manual/Skill based mini-project for all the Laboratory Courses to be offered in B.Tech.IV semester(for batch admitted in 2023-24) were discussed and finalized. Experiment list/ Lab manual/Skill based mini-project of CSE IV semester is enclosed in <u>Annexure- 14</u> Experiment list/ Lab manual/Skill based mini-project of CSD IV semester is enclosed in <u>Annexure- 15</u>							
Item 13	To finalize the Skill Internship Project (SIP) module to be offered in Dec 2024. <table><tr><th>Skill Internship Project (SIP) module</th></tr><tr><td>Website Development</td></tr><tr><td>Problem Solving Through Programming</td></tr><tr><td>Machine Learning for Computer Vision Using Python</td></tr><tr><td>Developing a Python-based Visual Interface</td></tr><tr><td>Concepts of Statistical Data Analysis & Visualization Using R</td></tr><tr><td>Introduction to data analysis using power BI</td></tr></table>	Skill Internship Project (SIP) module	Website Development	Problem Solving Through Programming	Machine Learning for Computer Vision Using Python	Developing a Python-based Visual Interface	Concepts of Statistical Data Analysis & Visualization Using R	Introduction to data analysis using power BI
Skill Internship Project (SIP) module								
Website Development								
Problem Solving Through Programming								
Machine Learning for Computer Vision Using Python								
Developing a Python-based Visual Interface								
Concepts of Statistical Data Analysis & Visualization Using R								
Introduction to data analysis using power BI								
Item 14	To propose the content of the courses identified for MITS-MOOC development to be offered in blended mode for VII Semester DE/OC courses for the batch admitted in 2022-23.							

Computer Science and Engineering

7

06 DEC 2024

Recommended in the BoS meeting of CSE held on 06/12/2024

(Signatures)



MITS-MOOC development

Course Name	Faculty Name	Batch Admitted (2022-23, 2023-24, 2024-25)	Category (DE/SPC/OC)
Web Technologies	Dr. Gagandeep Kaur	2022-23 2023-24	OC2
Data Structures	Dr. Ranjeet K. Singh	2022-23 2023-24	OC2
Natural Language Processing	Dr. Praphula Jain	2022-23 2023-24	DE2
Soft Computing	Dr. Smita Parte	2022-23	DE2
High Speed Networks	Dr. Gagandeep Kaur	2022-23	DE2

- Item 15** To review the CO attainments, identify gaps and suggest corrective measures for the improvement in the CO attainment levels for the courses taught in **Jan-June 2024 Session**.
CO attainments <VIEW>
CO attainment levels for all the courses taught during **Jan-June 2024 session** is enclosed in **Annexure 11**
- Item 16** To review the PO attainment, CO-PO mapping matrix and action to be taken to improve PO attainment level.
PO attainments <VIEW>
PO attainment, CO-PO mapping matrix and action to be taken to improve PO attainment level. enclosed in **Annexure 12**
- Item 17** To review curricula feedback from various stakeholders, its analysis and impact
Student & Faculty Co/Curriculum <VIEW>
Alumni <VIEW>
Employer <VIEW>
- Item 18** To discuss and recommend the scheme structure & syllabi of PG Programme (M.E./M.Tech./MCA/MBA) along with their COs (for batch admitted in 2023-24).
- Item 19** Any other matter.

M. K. Singh
Dean

Faculty of Engineering & Technology
Computer Science and Engineering
MITS-GU



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)



(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade

Annexure-1

Scheme

B. Tech VIII Semester

For batch admitted 2021-22

(Computer Science and Engineering)

Handwritten signature



महाविद्यालय एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

Deemed to be University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ GRADE



MAHARASHTRA
 GOVT. ENGINEERING COLLEGE

Department of Computer Science and Engineering

Scheme of Evaluation

B. Tech. VIII Semester (CSE)

(for batch admitted in academic session 2021-22)

[for batch 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	Duration of Exam.
				Theory Slot		Practical Slot		MOOCs									
				End Term Evaluation	Continuous Evaluation		Continuous Evaluation	Lab Work & Sessional Project	Skill Based Mini Project	Assignment		Exam					
					End Sem. Exam	Proficiency in subject /course							Mid Sem Exam.	Quiz/ Assignment			
1.	DE	DE	Departmental Elective*(DE-5)	-	-	-	-	-	25	75	100	3	-	Online	MCQ	3 Hrs	
2.	OC	OC	Open Category * (OC-3)	-	-	-	-	-	25	75	100	3	-	Online	MCQ	3 Hrs	
3.	150811	DLC	Internship/Project start-up)	-	-	-	-	250	150	-	400	-	18	offline	SO		
4.	150812	-	Professional Development#	-	-	-	-	50	-	-	50	-	4	-	-		
Total				-	-	-	-	300	150	150	650	06	22	17	-		
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													

*Proficiency in course/subject – includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in that particular course/subject
 Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Engineering / Language
 Credits of Natural Sciences & Skills will be added in the VI Semester
 MCQ: Multiple Choice Question AO: Assignment + Oral PF: Pen Paper SO: Submission + Oral



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Theory			Mode of Teaching			Mode of Examination				Total Credits	
Offline	Online	Blended		Lab	NEC/professional development	Theory			Lab	SIP/SLP/NEC/ professional development	
		Offline	Online			PP	AO	MCQ			SO
-	06			09	02			06	09	02	17
-	35			53	12			35	53	12	Credits %

DE-5*	
S. No.	Subject Code
1.	150871
2.	150872
3.	150863

OC-3*	
S. No.	Subject Code
1.	Affective Computing noc25-cs04
2.	Cloud Computing noc25-cs11
3.	Compiler Design noc25-cs13

Handwritten signatures and initials in blue ink, including a large signature at the top right and several smaller ones below it.



महाव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAAC ACCREDITED WITH A++ GRADE



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

Minor Specialization*(to be opted by students of Other Department)	
Advanced Computer Networks noc25-cs02	
Data Mining noc25-cs19	
Getting Started with Competitive Programming noc25-cs36	

Honors*(to be opted by students of Parent Department)

Track	Course
Information Security	Cryptography and Network Security
	Quantum Algorithms and Cryptography
	Foundation of Cloud IoT Edge ML
IoT	Design and Engineering of Computer Systems
	Edge Computing
High Performance Computing	Embedded System Design with ARM

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

4
P
C
A
T
S
R
P
S



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)
(Declared Under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-2

Scheme
B. Tech VIII Semester
For batch admitted 2021-22
(Computer Science and Design)



महाविद्यालयी एवं विश्वीय स्तर पर, गणित (ग.वि.), दिल्ली
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
 Deemed to be University
 (Declared under Distinct Category by Ministry of Education, Government of India)
 NAAC ACCREDITED WITH A++ GRADE

Department of Computer Science and Engineering
Scheme of Evaluation
B. Tech. VIII Semester (CSD)

(for batch 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	Duration of Exam.	
				Theory Slot			Practical Slot		MOOCs			L	T	P				
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation									
				End Sem. Exam	Proficiency in subject /course	Mid Sem Exam.	Quiz/ Assignment		Lab Work & Sessional Project	Skill Based Mini Project								Assig nme nt
1.	DE	DE	Departmental Elective*(DE-5)	-	-	-	-	-	-	3	-	-	3	Online	MCQ	3 Hrs		
2.	OC	OC	Open Category (OC-3)	-	-	-	-	-	-	-	3	-	-	3	Online	MCQ	3 Hrs	
3.	290801	DLC	Internship/Project Project/Innovation & start-up	-	-	-	-	250	150	-	-	-	-	18	Blended	SO		
4.	290802	-	Professional Development#	-	-	-	-	50	-	-	-	-	-	4	-	-		
Total				-	-	-	-	300	150	-	50	150	-	22	17	-		
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														

*Proficiency in course/subject – includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in that particular course/subject
 Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Engineering / Language
 Credits of Natural Sciences & Skills will be added in the VI Semester



**माधव प्रद्यागका एव त्वाशन सस्थान, ग्वालयर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA**
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE

MCQ: Multiple Choice Question

AO: Assignment + Oral PP: Pen Paper

SO: Submission + Oral

Mode of Teaching				Mode of Examination				Total Credits
Theory		Lab	NEC/professional development	Theory		Lab	SIP/SLP/NEC/professional development	
Offline	Online	Blended	Offline	Interactive	PP	AO	MCQ	SO
-	06	Offline	09	02			06	02
-	35		53	12			35	12
Credits %								
17								

DE-5*		
S. No.	Subject Code	Subject Name
1.	290811	GPU Architectures and Programming noc25-cs37
2.	290812	Deep Learning - IIT Ropar noc25-cs21
3.	290813	Selected Topics in Algorithms noc25-cs64

OC-3*		
S. No.	Subject Code	Subject Name
1.		Affective Computing noc25-cs04
2.		Cloud Computing noc25-cs11
3		Compiler Design noc25-cs13

A collection of various handwritten signatures and initials in blue ink, arranged in a grid-like pattern. The signatures are diverse in style, including cursive, block letters, and stylized marks. Some are enclosed in circles or other shapes. The background is white.



महाविद्यालय एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



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

Minor Specialization* (to be opted by students of Other Department)
Advanced Computer Networks noc25-cs02
Data Mining noc25-cs19
Getting Started with Competitive Programming noc25-cs36

Honors* (to be opted by students of Parent Department)

Track	Course
Information Security	Cryptography and Network Security
	Quantum Algorithms and Cryptography
	Foundation of Cloud IoT Edge ML
IoT	Design and Engineering of Computer Systems
	Edge Computing
High Performance Computing	Embedded System Design with ARM

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

Handwritten signatures and initials in blue ink, including a large 'R' and various initials like 'P', 'A', 'S', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z'.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Annexure-3

Scheme
B. Tech VI Semester
For batch admitted 2022-23
(Computer Science and Engineering)



महाव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
 Deemed to be University
 (Declared under Distinct Category by Ministry of Education, Government of India)
 NAAC ACCREDITED WITH A++ GRADE



MAH
 1983

Department of Computer Science and Engineering
Scheme of Evaluation
B. Tech. VI Semester (CSE)

(for batch admitted in academic session 2022-23)																				
B. Tech. VI Semester (CSE)																				
S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted										Total Marks	Contact Hours per week		Total Credits	Mode of Teaching	Mode of Exam	Duration of Exam
				Theory Slot			Practical Slot				MOOCs									
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation		Assignment	Exam								
				End Sem. Exam	Proficiency in subject /course	Mid Sem. Exam.	Quiz/Assign ment		Lab Work & Sessional	Skill Based Mini Project										
1.	2150601	DC	Digital Image Processing	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Blended	PP	2 Hrs
2.	2150602	DC	Machine Learning	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Blended	PP	2 Hrs
3.	DE	DE	Departmental Elective* (DE-1)	-	-	-	-	-	-	-	25	75	100	3	-	-	3	Blended	MCQ	3 Hrs
4.	OC	OC	Open Category (OC-1)	50	10	20	20	-	-	-	-	-	100	3	-	-	3	Blended	PP	2 Hrs
5.	2150603	DLC	Minor Project-II	-	-	-	-	60	40	-	-	-	100	-	-	6	3	Offline	SO	
6.	200XXX	CLC	Novel Engaging Course (Informal Learning)	-	-	-	-	50	-	-	-	-	50	-	-	2	1	SO	SO	-
7.	NSS	NSS	Natural Science & Skills	200	40	80	80	120	40	40	-	-	600	1	-	2	2*			
Total				350	70	140	140	350	120	80	25	75	1350	13	-	14	20			
				10	20	20	20	-	-	-	-	-	100	2	-	-	Grade	Online	M CQ	1.5 Hrs
10.	100507th	MAC	Intellectual Property Rights(IPR)	50																

*Proficiency in course/subject – includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in that particular course/subject
 Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Engineering / Language
 Credits of Natural Sciences & Skills will be added in the VI Semester
 MCQ: Multiple Choice Question, AO: Assignment + Oral, PP: Pen Paper, SO: Submission + Oral



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Mode of Teaching				Mode of Examination				Total Credits	
Theory		Lab	NEC	Theory		Lab	SIP/SLP/NEC		
Offline	Online	Blended	Offline	Online	PP	AO	MCQ		SO
	3+2*	11	-	3	1	11	03+2*	01	20
	15+10*	55		15	5	55	15+10*	15	Credits %

DE-1*		
S. No.	Subject Code	Subject Name
1.	2150611	User-centric Computing For Human-Computer Interaction noc25-cs72
2.	2150612	Games and Information noc25-cs35
3.	2150613	Getting Started with Competitive Programming noc25-cs36

Handwritten signatures and initials in blue ink.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



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

Minor Specialization* (to be opted by students of Other Department):	
Programming in Modern C++ noc25-cs58	
Introduction To Internet Of Things noc25-cs44	

Honors* (to be opted by students of Parent Department)	
Track I	Course
Information Security	Foundations of Cryptography noc25-cs31
	Secure Computation: Part I noc25-cs63
IoT	Introduction To Industry 4.0 And Industrial Internet Of Things noc25-cs43
	Wireless Ad Hoc and Sensor Networks noc25-cs74
High Performance Computing	Parallel Computer Architecture noc25-cs54
	Linear programming and its applications to computer science noc25-cs77

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

Handwritten signatures and initials in blue ink, including a large signature on the left and several smaller ones on the right.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-4

Scheme

B. Tech VI Semester

For batch admitted 2022-23

(Computer Science and Design)



महाव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
 Deemed to be University
 (Declared under Distinct Category by Ministry of Education, Government of India)
 NAAC ACCREDITED WITH A++ GRADE



Department of Computer Science and Engineering
Scheme of Evaluation
B. Tech. VI Semester (CSD)

(for batch admitted in academic session 2022-23)

Maximum Marks Allotted																Total Marks	Contact Hours per week		Total Credits	Mode of Evaluation	Marks Duration of Exam
S. No.	Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot			MOOCs										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation		Assignment	Exam									
						Mid Sem. Exam.	Quiz/Assignment		Lab Work & Sessional	Skill Based Mini Project											
1.	2290601	DC	IOT System Design	50	10	20	20	60	20	20	-	-	200	3	2	4	Blended	PP	2 Hrs		
2.	2290602	DC	Artificial Intelligence & Machine Learning	50	10	20	20	60	20	20	-	-	200	3	2	4	Blended	PP	2 Hrs		
3.	DE	DE	Departmental Elective*	-	-	-	-	-	-	-	25	75	100	3	-	3	Blended	MCQ	3 Hrs		
4.	OC	OC	Open Category (OC-I)	50	10	20	20	-	-	-	-	-	100	3	-	3	Blended	PP	2 Hrs		
5.	2290603	DLC	Minor Project-II	-	-	-	-	60	40	-	-	-	100	-	6	3	Offline	SO	-		
6.	200XXX	CLC	Novel Engaging Course (Informal Learning)	-	-	-	-	50	-	-	-	-	50	-	2	1	SO	SO	-		
8.	NSS	NSS	Natural Science & Skills	200	40	80	80	120	40	40	-	-	600	1	2	2*	-	-	-		
Total				350	70	140	140	350	120	80	25	75	1350	13	4	20	Online	MCQ	1.5 Hrs		
10.	1000007 ^m	MAC	Intellectual Property Rights (IPR)	50	10	20	20	-	-	-	-	-	100	2	-	-	Grade	-	-		

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

Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Engineering / Language

Credits of Natural Sciences & Skills will be added in the VI Semester

AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral

MCQ: Multiple Choice Question

(Handwritten signatures and initials)



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
 Deemed to be University
 (Declared under Distinct Category by Ministry of Education, Government of India)
 NAAC ACCREDITED WITH A++ GRADE

Mode of Teaching				Mode of Examination				Total Credits
Theory		Lab		Theory		Lab	SIP/SIP/NEC	
Offline	Online	Offline	Online	PP	MCQ	SO	SO	
3+2*	11	3	-	11	03+2*	03	01	20
15+10*	55	15	55	55	15+10*	15	5	Credits %

DE-1*		
S. No.	Subject Code	Subject Name
1.	2290611	Reinforcement Learning noc25-cs62
2.	2290612	Digital Design with Verilog noc25-cs25
3.	290613	Getting Started with Competitive Programming noc25-cs36



WITTS

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

Minor Specialization* (to be opted by students of Other Department)

Programming in Modern C++ noc25-cs58

Introduction To Internet Of Things noc25-cs44

Honors(to be noted by students of Parent Department)*

	Honors (to be open by committee)	Course
Track1 Information Security		Foundations of Cryptography noc25-cs31
		Secure Computation: Part I noc25-cs63
		Introduction To Industry 4.0 And Industrial Internet Of Things noc25-cs43
IoT		Wireless Ad Hoc and Sensor Networks noc25-cs74
		Parallel Computer Architecture noc25-cs54
		Linear programming and its applications to computer science noc25-cs77
High Performance Computing		

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



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)



(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade

Annexure-5

Syllabi of Departmental Core Courses
B. Tech VI Semester
For batch admitted 2022-23
(Computer Science and Engineering)



Department of Computer Science and Engineering

Digital Image Processing

2150601

COURSE OBJECTIVES:

1. To understand the fundamentals of image acquisition, image processing in spatial and frequency domain.
2. To understand image transforms used in digital image processing.
3. To know about the image restoration techniques and methods used in image processing.

Unit I Introduction and Fundamentals

Introduction to Image Processing Systems, Digital Image fundamentals: Components of Digital Image Processing Systems, Image Model, Image 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 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, Geometric Transformation Optimization for High-Resolution Image Registratio, Multi-Thresholding and Region-Growing Algorithms for Complex Image Segmentation

Handwritten signatures and marks at the bottom of the page.



RECOMMENDED BOOKS

1. Digital Image Processing 2nd Edition, Rafael C. Gonzalevez and Richard E. Woods. Published by: Pearson Education.
2. Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons.
3. Fundamentals of Digital Image Processing, A.K. Jain. Published by Prentice Hall

COURSE OUTCOMES

After completion of the course students would be able to:

- CO1: **Describe** the fundamental concepts of digital image processing
 CO2: **Apply** techniques for spatial domain image enhancement
 CO3: **Analyze** frequency domain methods for image enhancement and restoration
 CO4: **Evaluate** morphological image processing techniques, such as dilation, erosion, and algorithms for region filling, boundary extraction, and thinning.
 CO5: **Develop** and implement methods for image segmentation and registration

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2		1	2		3			1	3	1	3	2	2
CO2	3	2	1	2		3			2		2	3	2	3
CO3	3	3	2			3			3			3	2	3
CO4	2	3	2	2		3			2		2	3	2	2
CO5	3	2	2			3		1	2		2	3	3	3

1 - Slightly; 2 - Moderately; 3 - Substantially

[Handwritten signatures and initials in blue ink]



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Digital Image Processing

2150616 (OLD)

COURSE OBJECTIVES:

1. To understand the fundamentals of image acquisition, image processing in spatial and frequency domain.
2. To understand image transforms used in digital image processing.
3. To know about the image restoration techniques and methods used in image processing.

Unit – I:

Introduction and Fundamental: Introduction to Image Processing Systems, Digital Image fundamentals: Components of Digital Image Processing Systems, Image Model, Image 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:

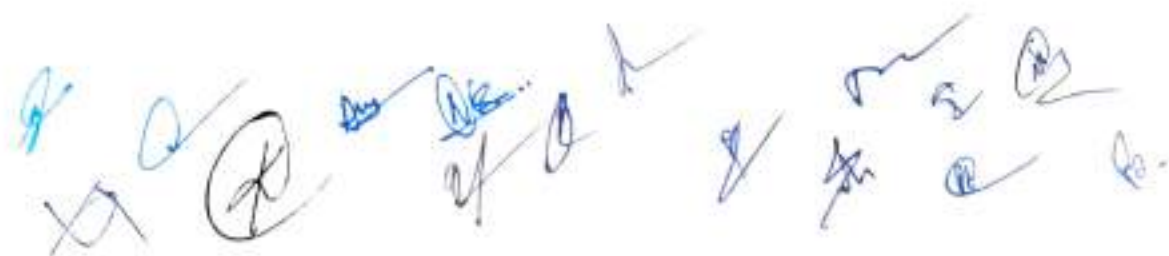
Image Enhancement in Frequency Domain: Introduction to Fourier Transform, Filters: Low Pass and High Pass, Gaussian Filters, Homomorphic Filtering, **Image Restoration:** Model of Image Degradation/Restoration process, Noise Models, Noise Reduction in Spatial and Frequency Domain, Inverse Filtering, 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 and boundary detection.





RECOMMENDED BOOKS:

1. Digital Image processing, Rafael C Gonzalez, Richard E Woods, Pearson Education.
2. Fundamental of Digital Image processing, K. Jain, Pearson education.
3. Digital Image Processing, S. Esakkirajan, S. Jayaraman, T. Veerakumar, Tata McGraw- Hill Education

COURSE OUTCOMES: After completing the course, the student will be able to:

CO1: Explain different modalities and current techniques in image acquisition.

CO2: Classify spatial and frequency domain techniques used in image processing.

CO3: Apply image processing techniques to enhance visual images

CO4: Analyze 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 problem

Handwritten signatures and initials in blue ink, including a large circled 'K' and various other marks.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Machine Learning

2150602

COURSE OBJECTIVES:

1. To understand types of issues and challenges that could be solved by machine learning.
2. To be able to understand wide variety of learning models and use them.
3. To be able to evaluate and optimize these models

Unit – I:

Introduction to Machine Learning: Learning, Traditional Vs Machine Learning, Types Of ML, Classification and Regression model, Challenges faced by ML, Steps of developing an ML model, Bias and Variance, Underfitting and Overfitting, Regularization, Data visualization, Outlier, Testing and validating, K cross validation, Hyperparameter tuning, Model Selection.

Unit – II:

Model optimization and Evaluation: Parametric and non- Parametric model, Learner performance evaluation, confusion matrix, Recall, accuracy, precision, Model optimization, Cost/Loss Function, Derivative of cost function and non-derivative cost function, Gradient descent, Mini-batch Gradient Descent (scikit-learn), Stochastic Gradient descent(scikit-learn), Momentum(scikit-learn).

Unit – III:

Supervised Machine Learning Algorithm with python: Model Complexity vs Dataset Size, Supervised Machine Learning Algorithms, k-Nearest Neighbors, Linear Regression, RMSE, Logistic Regression, Log Loss, Support Vector Machine, Hinge Loss, Kernel Trick, polynomial Kernel, Decision Trees, Gini impurity.

Unit – IV:

Ensemble Learner with python: Ensemble learner, Bagging, Pasting, Voting Classifiers, Out-of-Bag, Evaluation, Random Patches and Random Subspaces, Random Forests, Extra-Trees, Boosting, AdaBoost, Gradient Boosting, Stacking.

Unit –V:

Unsupervised Machine Learning with python: The Curse of Dimensionality, Principal component analysis, Clustering, K-Means, Limits of K-Means, Clustering, DBSCAN. **ElasticNet**, **Transformer-based models**, **Explainable ML**, **Ethical ML**, **AutoML**, **Capstone Project** and **Case Studies:** Build an end-to-end supervised or unsupervised ML pipeline.

Handwritten signatures and marks at the bottom of the page.



RECOMMENDED BOOKS:

1. Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow by Aurélien Géron
2. Introduction to Machine Learning with Python by Andreas C. Müller & Sarah Guido, O'reilly
3. Machine Learning For Absolute Beginners: A Plain English Introduction (Second Edition)" by Oliver Theobald
4. Machine Learning For Dummies" by John Paul Mueller and Luca Massaron
5. Machine Learning in Action" by Peter Harrington

COURSE OUTCOMES: After completing the course, the student will be able to:

CO1: Define basic concepts of Machine Learning.

CO2: Illustrate various techniques for learner evaluation and optimization using python

CO3: Implement various types of supervised machine learning algorithm using python

CO4: Apply ML ensemble model to solve real world problem using python

CO5: Apply unsupervised ML techniques to solve real world problems using python

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	3	2	1	1	-	1	1	2	3	3	1
CO2	3	3	3	1	2	1	-	-	1	1	1	3	3	1
CO3	3	3	3	2	3	1	1	-	1	1	2	3	3	2
CO4	3	2	2	2	3	1	-	-	1	1	2	3	3	3
CO5	2	2	3	3	3	1	-	-	2	3	3	3	3	2

1 - Slightly; 2 - Moderately; 3 - Substantially

(Handwritten signatures and initials)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Machine Learning

150617(OLD)

COURSE OBJECTIVES:

1. To understand types of issues and challenges that could be solved by machine learning.
2. To be able to understand wide variety of learning models and use them.
3. To be able to evaluate and optimize these models

Unit – I:

Introduction to Machine Learning: Learning, Traditional Vs Machine Learning, Types Of ML, Classification and Regression model, Challenges faced by ML, Steps of developing an ML model, Bias and Variance, Underfitting and Overfitting, Regularization, Data visualization, Outlier, Testing and validating, K cross validation, Hyperparameter tuning, Model Selection.

Unit – II:

Model optimization and Evaluation: Parametric and non- Parametric model, Learner performance evaluation, confusion matrix, Recall, accuracy, precision, Model optimization, Cost/Loss Function, Derivative of cost function and non-derivative cost function, Gradient descent, Mini-batch Gradient Descent (scikit-learn), Stochastic Gradient descent(sckit-learn), Momentum(sckit-learn).

Unit – III:

Supervised Machine Learning Algorithm with python: Model Complexity vs Dataset Size, Supervised Machine Learning Algorithms, k-Nearest Neighbors, Linear Regression, RMSE, Logistic Regression, Log Loss, Support Vector Machine, Hinge Loss, Kernel Trick, polynomial Kernal, Decision Trees, Gini impurity.

Unit – IV:

Ensemble Learner with python: Ensemble learner, Bagging, Pasting, Voting Classifiers, Out-of-Bag, Evaluation, Random Patches and Random Subspaces, Random Forests, Extra-Trees, Boosting, AdaBoost, Gradient Boosting, Stacking.

Unit – V:

Unsupervised Machine Learning with python: The Curse of Dimensionality, Projection, Manifold Learning Principal component analysis, Clustering, K-Means, Limits of K-Means, Clustering for Image Segmentation, Clustering for Preprocessing, Clustering for Semi-Supervised Learning, DBSCAN.



RECOMMENDED BOOKS:

1. Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow by Aurélien Géron
2. Introduction to Machine Learning with Python by Andreas C. Müller & Sarah Guido, O'reilly
3. Machine Learning For Absolute Beginners: A Plain English Introduction (Second Edition)" by Oliver Theobald
4. Machine Learning For Dummies" by John Paul Mueller and Luca Massaron
5. Machine Learning in Action" by Peter Harrington

COURSE OUTCOMES: After completing the course, the student will be able to:

CO1: Define basic concepts of Machine Learning.

CO2: Illustrate various techniques for learner evaluation and optimization using python

CO3: Implement various types of supervised machine learning algorithm using python

CO4: Apply ML ensemble model to solve real world problem using python

CO5: Apply unsupervised ML techniques to solve real world problems using python

Handwritten signatures and initials in blue ink, including "Ang", "Nis...", and various other marks.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-6

Syllabi of Departmental Core Courses

B. Tech VI Semester

For batch admitted 2022-23

(Computer Science and Design)



Department of Computer Science and Engineering

IoT System Design

2290601

COURSE OBJECTIVES

- To introduce the fundamentals of internet of Things.
- To understand the technologies, system architecture, and communication architecture that propelled the growth of IoT Systems.
- To develop IoT infrastructure for popular applications.

- Unit-1 Introduction to Internet of Things (IoT):** Vision, Definition, IoT architecture: Layers and protocols, technology behind IoT, Sources of the IoT, M2M Communication, IoT Examples. Sensing, Actuation. IoT communication models: Device-to-device, device-to-cloud, device-to-gateway, Challenges and opportunities in IoT
- Unit-2 Hardware for IoT:** Sensors, Digital sensors, actuators, radio frequency identification (RFID) technology, microcontrollers, and single-board computers, **Embedded Platforms for IoT:** Embedded computing basics, Overview of IOT supported Hardware platforms such as Arduino, Raspberry pi, Jetson nano Beagle Bone, and Intel Galileo boards.
- Unit-3 IoT Protocols and Arduino Programming:** Wi-Fi, Bluetooth, CoAP, LPWAN protocol. Sensor Networks: Sensor deployment & Node discovery, **Introduction to Arduino Programming:** Arduino Platform Boards Anatomy, Arduino IDE, coding, using emulator, using libraries, additions in Arduino, programming the Arduino for IoT, Integration of Sensors and Actuators with Arduino.
- Unit-4: IoT Data Management and Analytics:** Data generation and collection in IoT systems, IoT data storage, Cloud-based and local storage, Data preprocessing and analysis, Basics of analytics for IoT data, IoT dashboards, Visualization and interpretation of data, Role of machine learning and AI in IoT
- Unit-5: Challenges in IoT Design challenges:** IoT applications: Smart homes, smart cities, healthcare, agriculture, Smart Metering, City Automation, Automotive Applications, home automation, smart cards, and industry, IoT and automation: Role in industrial IoT (IIoT), Emerging technologies: AIoT, Blockchain for IoT, and 5G integration IoT, Development Challenges, Security Challenges.

Handwritten signatures and initials at the bottom of the page.



REFERENCE BOOKS: -

1. Olivier Hersent, David Boswarthick, Omar Elloumi "The Internet of Things key applications and protocols", Wiley.
2. Jeeva Jose, Internet of Things, Khanna Publishing House.
3. Michael Miller "The Internet of Things" by Pearson.
4. Raj Kamal "INTERNET OF THINGS", McGraw-Hill, 1ST Edition, 2016.
5. Arshdeep Bahga, Vijay Madisetti "Internet of Things (A hands on approach)" 1ST edition, VPI publications, 2014.
6. Adrian McEwen, Hakin Cassimally "Designing the Internet of Things" Wiley India.

COURSE OUTCOMES:

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

1. Understand the basic concepts, principles and challenges in IoT.
2. Describe the functioning of hardware devices and sensors used for IoT.
3. Analyze network communication aspects and protocols used in IoT.
4. Apply IoT for developing real life applications using Arduino programming.
5. Develop IoT infrastructure for popular applications

[Handwritten signatures and initials in blue ink]



IoT System Design 290615(OLD)

COURSE OBJECTIVES

- To introduce the fundamentals of internet of Things.
- To understand the technologies, system architecture, and communication architecture that propelled the growth of IoT Systems.
- To develop IoT infrastructure for popular applications.

- Unit-1 Introduction to Internet of Things (IoT):** Vision, Definition, Conceptual Framework, Architectural view, technology behind IoT, Sources of the IoT, M2M Communication, IoT Examples. Sensing, Actuation. **Design Principles for Connected Devices:** IoT/M2M systems layers and design standardization, communication technologies, data enrichment and consolidation, ease of designing and affordability.
- Unit-2 Hardware for IoT:** Sensors, Digital sensors, actuators, radio frequency identification (RFID) technology, wireless sensor networks, participatory sensing technology. **Embedded Platforms for IoT:** Embedded computing basics, Overview of IOT supported Hardware platforms such as Arduino, NetArduino, Raspberry pi, Beagle Bone, Intel Galileo boards and ARM cortex.
- Unit-3 Networking & Communication aspects in IoT:** Wireless Medium access issues, MAC protocol survey, Survey routing protocols. **Sensor Networks:** Sensor deployment & Node discovery, Data aggregation & dissemination. Machine-to-Machine Communications
- Unit-4: Interoperability in IoT:** Device Interoperability and user Interoperability, Syntactic and semantic Interoperability. **Introduction to Arduino Programming:** Arduino Platform Boards Anatomy, Arduino IDE, coding, using emulator, using libraries, additions in Arduino, programming the Arduino for IoT. Integration of Sensors and Actuators with Arduino.
- Unit-5: Challenges in IoT Design challenges:** Development Challenges, Security Challenges. Other challenges IoT Applications: Smart Metering, E-health, City Automation, Automotive Applications, home automation, smart cards, communicating data with H/W units, mobiles, tablets, Designing of smart street lights in smart city.



REFERENCE BOOKS: -

1. Olivier Hersent, David Boswarthick, Omar Elloumi "The Internet of Things key applications and protocols", Wiley.
2. Jeeva Jose, Internet of Things, Khanna Publishing House.
3. Michael Miller "The Internet of Things" by Pearson.
4. Raj Kamal "INTERNET OF THINGS", McGraw-Hill, 1ST Edition, 2016.
5. Arshdeep Bahga, Vijay Madisetti "Internet of Things (A hands on approach)" 1ST edition, VPI publications, 2014.
6. Adrian McEwen, Hakin Cassimally "Designing the Internet of Things" Wiley India.

COURSE OUTCOMES:

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

- CO1. Understand the basic concepts, principles and challenges in IoT.
- CO2. Describe the functioning of hardware devices and sensors used for IoT.
- CO3. Analyze network communication aspects and protocols used in IoT.
- CO4. Apply IoT for developing real life applications using Arduino programming.
- CO5. Develop IoT infrastructure for popular applications

[Handwritten signatures and initials in blue ink]



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under District Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Department of Computer Science and Engineering
Artificial Intelligence & Machine Learning

2290602

COURSE OBJECTIVES:

1. To provide the fundamental knowledge of Artificial Intelligence and Machine Learning.
2. To understand the basic areas of AI & ML including problem solving, knowledge representation, reasoning, models, Loss functions.
3. To apply machine learning and optimization techniques to make predictions

Unit – I:

Introducing Artificial Intelligence: Introduction to AI - Intelligent Agents, Problem-Solving Agents, Searching for Solutions - Breadth-first search, Depth-first search, Hill-climbing search, simulated annealing search, Local Search in Continuous Spaces. Games - Optimal Decisions in Games, Water-Jug problem, Travelling salesman problem, Alpha-Beta Pruning.

Unit – II:

Knowledge Representation in AI: Need for Knowledge representation. Types of Knowledge. Knowledge and Intelligence, AI Knowledge cycle. Various approaches to Knowledge Representation. Requirements of Knowledge Representation System. Intelligent agent.

Constraint Satisfaction: Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Knowledge-Based Agents, Logic Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clauses.

Unit – III:

Introduction to Machine Learning: Learning, Traditional vs Machine Learning, Types of ML, Classification and Regression model, Challenges faced by ML, Steps of developing an ML model, Bias and Variance, Regularization, Testing and validating, K cross validation, Hyper parameter tuning, Model Selection.

[Handwritten signatures and initials at the bottom of the page]



Model optimization and Evaluation: Confusion matrix, Recall, accuracy, precision, Model optimization, Cost/Loss Function, Derivative of cost function and non-derivative cost function, Gradient descent.

Unit – IV:

Supervised Machine Learning Algorithm with python: Supervised Machine Learning Algorithms, k-Nearest Neighbors, Linear Regression, Logistic Regression, Support Vector Machine, Decision Trees, Ensemble learner, Random Forests.

Unit –V:

Unsupervised Machine Learning with python: The Curse of Dimensionality, Projection, Clustering, K-Means, Limits of K-Means, Clustering for Image Segmentation, Clustering for Preprocessing, Clustering for Semi-Supervised. Explainable AI (XAI) or AI, Ethical AI, AutoML, Capstone Project and Case Studies: Build an intelligent agent or a knowledge-based chatbot

RECOMMENDED BOOKS:

1. Artificial Intelligence: A Modern Approach by Stuart J. Russell and Peter Norvig, Prentice Hall.
2. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-Graw Hill.
3. Pattern Recognition and Machine Learning, Christopher M. Bishop
4. Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow by Aurélien Géron
5. Introduction to Machine Learning with Python by Andreas C. Müller & O'Reilly

COURSE OUTCOMES: After completing the course, the student will be able to:

CO1: Define basic concepts of Artificial Intelligence & Machine Learning.

CO2: Illustrate various techniques for knowledge representation and processing.

CO3: Apply various model optimization and tuning approaches.

CO4: Develop a model using supervised/unsupervised machine learning algorithms for classification/prediction/clustering

CO5: Evaluate performance of machine learning algorithms on various data sets of a domain.

[Handwritten signatures and marks at the bottom of the page]



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under District Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
C01	3	2	2	3	2	1	1	-	1	1	2	3	3	1
C02	3	3	3	1	2	1	-	-	1	1	3	3	3	1
C03	3	3	3	2	3	1	1	-	1	1	2	3	3	2
C04	3	3	2	2	3	1	-	-	1	1	2	3	3	3
C05	2	2	3	3	3	1	-	-	2	3	3	3	3	2

1 - Slightly; 2 - Moderately; 3 - Substantially

Handwritten signatures and initials in blue ink, including a large circular stamp on the left and several individual signatures across the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under District Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Department of Computer Science and Engineering
Artificial Intelligence & Machine Learning

290603(OLD)

COURSE OBJECTIVES:

1. To provide the fundamental knowledge of Artificial Intelligence and Machine Learning.
2. To understand the basic areas of AI & ML including problem solving, knowledge representation, reasoning, models, Loss functions.
3. To apply machine learning and optimization techniques to make predictions

Unit – I:

Introducing Artificial Intelligence: Introduction to AI - Intelligent Agents, Problem-Solving Agents, Searching for Solutions - Breadth-first search, Depth-first search, Hill-climbing search, simulated annealing search, Local Search in Continuous Spaces. Games - Optimal Decisions in Games, Water-Jug problem, Travelling salesman problem, Alpha-Beta Pruning.

Unit – II:

Knowledge Representation in AI: Need for Knowledge representation. Types of Knowledge. Knowledge and Intelligence, AI Knowledge cycle. Various approaches to Knowledge Representation. Requirements of Knowledge Representation System. Intelligent agent.

Constraint Satisfaction: Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Knowledge-Based Agents, Logic Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clause

Unit – III:

Introduction to Machine Learning: Learning, Traditional vs Machine Learning, Types of ML, Classification and Regression model, Challenges faced by ML, Steps of developing an ML model, Bias and Variance, Regularization, Testing and validating, K cross validation, Hyper parameter tuning, Model Selection.

Model optimization and Evaluation: Confusion matrix, Recall, accuracy, precision, Model optimization, Cost/Loss Function, Derivative of cost function and non-derivative cost function, Gradient descent, Mini-batch Gradient, Descent (scikit-learn), Stochastic Gradient descent (scikit-learn), Momentum (scikit-learn).

[Handwritten signatures and marks at the bottom of the page]



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वाल्होर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under District Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Unit – IV:

Supervised Machine Learning Algorithm with python: Supervised Machine Learning Algorithms, k-Nearest Neighbors, Linear Regression, Logistic Regression, Log Loss, Support Vector Machine, Hinge Loss, Kernel Trick, polynomial Kernel, Decision Trees, Gini impurity, Ensemble learner, Random Forests.

Unit –V:

Unsupervised Machine Learning with python: The Curse of Dimensionality, Projection, Manifold Learning Principal component analysis, Clustering, K-Means, Limits of K-Means, Clustering for Image Segmentation, Clustering for Preprocessing, Clustering for Semi-Supervised

RECOMMENDED BOOKS:

1. Artificial Intelligence: A Modern Approach by Stuart J. Russell and Peter Norvig, Prentice Hall.
2. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-Graw Hill.
3. Pattern Recognition and Machine Learning, Christopher M. Bishop
4. Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow by Aurélien Géron
5. Introduction to Machine Learning with Python by Andreas C. Müller & O'Reilly

COURSE OUTCOMES: After completing the course, the student will be able to:

- CO1: Define basic concepts of Artificial Intelligence & Machine Learning.
- CO2: Illustrate various techniques for knowledge representation and processing.
- CO3: Apply various model optimization and tuning approaches.
- CO4: Develop a model using supervised/unsupervised machine learning algorithms for classification/prediction/clustering
- CO5: Evaluate performance of machine learning algorithms on various data sets of a domain.

(Handwritten signatures and initials)



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Annexure-7

Syllabi of Departmental Open Courses
B. Tech VI Semester
For batch admitted 2022-23
(Computer Science and Engineering)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

OPERATING SYSTEMS OC-1

COURSE OBJECTIVES

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

Unit- I

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

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

Unit-II

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

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

Unit-III

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

Unit-IV

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

Unit-V

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

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

Emerging topics: Real-Time Operating systems (RTOS), Sustainable Software Lifecycle Management in Software engineering, Ethical Software Designed Development



RECOMMENDED BOOKS

- Operating System Concepts, Silberschatz, Ninth Edition, Willey Publication.
- Operating Systems, Internals and Design Principles, Stallings, Seventh Edition, Pearson Publication.
- OPERATING SYSTEMS, Dr. Sukomal Pal, AICTE
- Modern Operating Systems, Tanenbaum, Fourth Edition. Pearson Publication.

COURSE OUTCOMES

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

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

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	1	2	1	1	1	1	3	3	3
CO2	3	3	3	3	3	1	1	1	1	1	1	3	3	3
CO3	3	3	3	3	3	2	1	1	1	1	1	3	3	3
CO4	3	3	2	3	2	1	1	1	1	1	1	3	3	3
CO5	3	3	3	3	2	1	1	1	1	1	1	3	3	3

1 - Slightly; 2 - Moderately; 3 - Substantially

Handwritten signatures and initials in blue ink, likely representing faculty members or the course coordinator.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DATA BASE MANAGEMENT SYSTEM OC-1

COURSE OBJECTIVES

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

Unit-I

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

Unit-II

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

Unit-III

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

Unit-IV

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

[Handwritten signatures and marks at the bottom of the page]



Unit-V

Transaction Processing & Concurrency Control: Transaction Processing Concepts, ACID properties, State Diagram, Types of Transaction, Basic idea of serializability, Concurrency Control, Concurrent operation of Databases, Recovery, Types of Recovery, Basic overview of Distributed Databases System and Relational Database Management System, Concepts of Object-Oriented Database System and its tools, Database design for ORDBMS, ORBMS implementation and challenges, OODBMS, comparison of RDBMS, OODBMS and ORDBMS

RECOMMENDED BOOKS

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

COURSE OUTCOMES

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

CO1. Explain the terminology, features, classifications, characteristics, and data models embodied in database systems.

CO2. Describe the concepts related to the data modeling techniques, relational database model and relational algebra.

CO3. Apply the SQL commands over a given relational schema.

CO4. Analyze database schema to apply normalization technique for schema refinement.

CO5. Apply the transaction processing concepts and recovery methods over a real-time database system.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3					3	3	1	3	1
CO2	3	3	2	3	1					3	1	1	3	1
CO3	3	2	1	3	1						2	1	3	1
CO4	3	3	1	3	3						2	1	3	3
CO5	3	3	3	1	3	3					2	2	3	3

1 - Slightly; 2 - Moderately; 3 - Substantially

(Handwritten signatures and initials are present at the bottom of the page.)



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Annexure-8

Experiment list/Skill based mini-project
B. Tech VI Semester
For batch admitted 2022-23
(Computer Science and Engineering)



Department of Computer Science and Engineering
Digital Image Processing
2150601

LIST OF EXPERIMENT

1. Program to read an image and display it on the screen.
2. Program to determine image negative.
3. Read an image and perform different filtering operations (Average, Median etc.)
4. Program to create motion blur.
5. Program performs gray level slicing without background.
6. Program to perform brightness enhancement and brightness suppression of an image.
7. To create a vision program to find histogram value and display histogram of a grayscale and color image.
8. Read an RGB image and segment it using threshold method.
9. Read a colour image and separate the colour image into red green and blue planes.
10. Perform gamma correction for the given colour image
11. Program to perform different image conversion techniques
12. To create a color image and perform read and write operation
13. Code to implement watermarking in spatial domain.
14. Code to generate different levels of Gaussian Pyramid.

[Handwritten signatures and initials in blue ink]



Machine Learning

2150602

LIST OF EXPERIMENT

1. Perform exploratory data analysis and visualization after importing a .CSV file.
 - Handle missing data by detecting and dropping/ filling missing values.
 - Transform data using different methods.
 - Detect and filter outliers.
 - Perform Vectorized String operations on Pandas Series.
 - Visualize data using Line Plots, Bar Plots, Histograms, Density Plots and Scatter Plots.
2. Recognize data Skew-ness, outliers both using statistical function and Graphical representation.
3. Write a Python program to implement Simple Linear Regression to predict if male or female based on Height.
4. Implement Various Regression algorithm for House Price Prediction (USA housing Dataset) and compare their accuracy using scikit learn
 - Linear Regression
 - Polynomial Regression
 - Support Vector machine
5. Implement Logistic regression using softmax on iris dataset using scikit learn.
6. Implement Regularized Regression for house price prediction and evaluate their accuracy using scikit learn.
 - Ridge Regression
 - Lasso Regression
7. Implement Various Classification algorithms for iris data sets and evaluate their performance.
 - Naive Bayes Classifier
 - Logistic Regression
 - Support vector Machine
 - Decision tree
8. Implement Various ensemble on housing and iris dataset and evaluate their performance
 - Voting classifier
 - Random Forest (Bagging and pasting)
9. Implement principle component analysis on any chosen dataset/
10. Implement various clustering algorithm on chosen dataset



1. K-Mean

2. DBSCAN

✓

Handwritten signatures and initials in blue ink, including a large circled 'K' and various other marks.



Machine Learning

2150602

List of Skill Based Mini Project

1. Implement a regressor for any Medical disease diagnosis.
2. Implement a Cervical Cancer Risk Classifier
3. Regression model for Video Game Sales Prediction
4. Regression model for predicting if song will be popular
5. Regression model for Customer Behavior Analysis
6. Regression model to predict health insurance cost
7. Titanic Survival Prediction
8. Spam and not Spam Classifier
9. Spotify Music Recommendation System
10. Target Customer segmentation.

②

②

②

②

②

②

②

②

②

②

②



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)
(Declared Under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-9

Experiment list/Skill based mini-project
B. Tech VI Semester
For batch admitted 2022-23
(Computer Science and Design)



IoT System Design

2290601

List of Experiments

1. Implementation of LED Blinking with arduino/ Raspberry Pi.
2. Implementation of Temperature and Humidity Monitoring.
3. Interfacing between sensors and actuator.
4. Develop an intrusion detection system through motion sensors.
5. Develop an IoT-based Fire Detection System.
6. Develop an IoT-based Air Quality Monitoring.
7. Implementation of IoT-based Home Automation System
8. Implementation of MQTT-based IoT Communication.
9. Implementing a mechanism for IoT Data Logging to Cloud.
10. Implement a mechanism to control the state of an LED using a Bluetooth-enabled microcontroller.
11. Implementation of RFID-based Access Control System.



IoT System Design

2290601

List of Skill Based Mini Projects

1. Smart Home Automation System
2. Weather monitoring system
3. Smart Plant Watering System
4. Health Monitoring Wearable
5. Trash Can Monitoring System
6. Parking Space Availability System
7. Smart Irrigation System
8. Home Security System
9. Energy Consumption Monitoring
10. Air Quality Monitoring
11. Smart Traffic Management System
12. IoT-Based Fire Detection System
13. IoT-Based Attendance System
14. Smart Lighting System
15. Smart Retail Shelf Monitoring
16. Smart Greenhouse
17. IoT-Based Crop Monitoring
18. IoT-Based Object Tracking
19. Water Quality Monitoring in Rivers and Lakes
20. Solar Panel Monitoring System
21. IoT-Based Green Building System

Handwritten signatures and initials in blue ink, including a circled 'X', a large 'C', and various other marks.



Artificial Intelligence & Machine Learning

2290602

List of Experiment

1. Implement Depth first search for water jug problem
2. Write a Program to find the solution for travelling salesman Problem
3. Write a program to implement 8 puzzle problem
4. Write a program to implement Hill Climbing Algorithm
5. Write a program to implement A* Algorithm and AO* Algorithm
6. Perform exploratory data analysis and visualization after importing a .CSV file.
 - > Handle missing data by detecting and dropping/ filling missing values.
 - > Transform data using different methods.
 - > Detect and filter outliers.
 - > Perform Vectorized String operations on Pandas Series.
 - > Visualize data using Line Plots, Bar Plots, Histograms, Density Plots and Scatter Plots.
7. Implement Various Regression algorithm for House Price Prediction (USA housing Dataset) and compare there accuracy using scikitlearn
 - > Linear Regression
 - > Polynomial Regression
 - > Support Vector machine
8. Implement Regularized Regression for house price prediction and evaluate there accuracy using scikitlearn.
 - > Ridge Regression
 - > Lasso Regression
9. Implement Various Classification algorithm for iris data set and evaluate there performance.
 - > Navie Bayes Classifier
 - > Logistic Regression
 - > Support vector Machine
 - > Decision tree
10. Implement Various ensemble on housing and iris dataset and evaluate there performance
 - > Voting classifier
 - > Random Forest (Bagging and pasting)
11. Implement principle component analysis on any choosen dataset
12. Implement various clustering algorithm on choosen dataset
 - > K-Mean
 - > DBSCAN

[Handwritten signatures and initials at the bottom of the page]



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under District Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Artificial Intelligence & Machine Learning

2290602

List of Skill Based Mini Project

Artificial Learning Project

1. Build a bot which provides all the information related to students in college.
2. Build a virtual assistant for Wikipedia using Wolfram Alpha and Python.
3. Build a Banking Bot
4. Online Assignment Plagiarism Checker

Supervised learning projects

5. Implement a regressor for any Medical disease diagnosis.
6. Implement a Cervical Cancer Risk Classifier
7. Regression model for Video Game Sales Prediction
8. Calories Burnt Prediction using Machine Learning
9. Vehicle Count Prediction From Sensor Data
10. Regression model for predicting if song will be popular
11. Regression model for Customer Behavior Analysis
12. Regression model to predict health insurance cost
13. Titanic Survival Prediction

Unsupervised Learning Projects

14. Spam and not Spam Classifier
15. Spotify Music Recommendation System
16. Online Payment Fraud Detection using Machine Learning in Python
17. Customer Segmentation using Unsupervised Machine Learning in Python
18. Target Customer segmentation.
19. Topic Modeling for Twitter Customer Reviews
20. Bank-Note Authentication

[Handwritten signatures and marks at the bottom of the page]



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Annexure-10

Scheme
B. Tech IV Semester
For batch admitted 2023-24
(Computer Science and Engineering)

[Handwritten signature]

[Handwritten signature]



महाव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
 Deemed to be University
 (Declared under Distinct Category by Ministry of Education, Government of India)
 NAAC ACCREDITED WITH A++ GRADE



MTS

Department of Computer Science and Engineering
Scheme of Evaluation
B. Tech. IV Semester (CSE)

(for batch admitted in academic session 2023-24)

			Maximum Marks Allotted										Contact Hours per week			Mode of Teaching	Mode of Exam.	Duration of Exam.
S. No.	Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot				Total Marks	Total Credits						
				End Term Evaluation	Continuous Evaluation		End Sem. Exam.	Continuous Evaluation										
				End Sem. Exam	Proficiency in subject /course	Mid Sem. Exam.		Quiz/Assign ment		Lab Work & Sessional Project	Skill Based Mini Project	L	T	P				
1.	3150401	DC	Computer Networks	50	10	20	20	40	30	30	200	3	-	2	4	Blended	PP	2 Hrs
2.	3150402	DC	Software Engineering	50	10	20	20	-	-	-	100	2	1	-	3	Blended	PP	2 Hrs
3.	3150403	DC	Data Mining & Warehousing	50	10	20	20	40	30	30	200	3	-	2	4	Blended	PP	2 Hrs
4.	3150404	DC	Theory of Computation	50	10	20	20	-	-	-	100	2	1	-	3	Blended	PP	2 Hrs
5.	3150405	DC	Artificial Intelligence & Neural Network	50	10	20	20	-	-	-	100	3	-	-	3	Blended	PP	2 Hrs
6.	3150406	DLC	Programming Lab	-	-	-	-	40	30	30	100	-	-	4	2	offline	SO	
7.	2000XXX	CLC	Novel engaging courses	-	-	-	-	50	-	-	50	-	-	2	1	Online and Mentoring	SO	-
Total				250	50	100	100	170	90	90	850	13	02	10	20			
10.	MAC		Indian Constitution and Traditional Knowledge	50	10	20	20	-	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
11.	3000005	Natural Science & Skills	Environmental Engineering	50	10	20	20	-	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs

*Proficiency in course/subject – includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in that particular course/subject
 Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Engineering / Language
 Credits of Natural Sciences & Skills will be added in the VI Semester
 MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral

[Handwritten signatures and marks]

माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



MIT'S

Mode of Teaching				Mode of Examination				SIP/SLP/NEC	Total Credits
Theory		Blended		Theory		Lab			
Online	Offline	Online	Offline	AO	PP	MCQ	SO	SO	
	15	-	4	-	17	-	02	01	20
	75	-	20	-	85	-	10	5	Credits %

Handwritten signatures and initials in blue ink, including a large signature at the top and several smaller ones below it.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)
(Declared Under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-11

Scheme
B. Tech IV Semester
For batch admitted 2023-24
(Computer Science and Design)



महाव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
 Deemed to be University
 (Declared under Distinct Category by Ministry of Education, Government of India)
 NAAC ACCREDITED WITH A++ GRADE



NAAC
 ACCREDITED
 WITH A++
 GRADE

Department of Computer Science and Engineering
Scheme of Evaluation
B. Tech. IV Semester (CSD)

(for batch admitted in academic session 2023-24)

Maximum Marks Allotted																		
S. No.	Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot				Contact Hours per week			Total Credits	Mode of Teaching	Mode of Exam.	Duration of Exam.
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation									
				End Sem. Exam	Proficiency in subject /course	Mid Sem. Exam.	Quiz/Assign ment		Lab Work & Sessional	Skill Based Mini Project								
1.	3290401	DC	Web Technologies	50	10	20	20	40	30	30	30	3	-	2	4	Blended	PP	2 Hrs
2.	3290402	DC	Microprocessor Design & Interfacing	50	10	20	20	40	30	30	30	2	1	2	4	Blended	PP	2 Hrs
3.	3290403	DC	Software Engineering	50	10	20	20	-	-	-	-	3	-	-	3	Blended	PP	2 Hrs
4.	3290404	DC	Theory of Computation	50	10	20	20	-	-	-	-	2	1	-	3	Blended	PP	2 Hrs
5.	3290405	DC	Computer Networks	50	10	20	20	-	-	-	-	3	-	-	3	Blended	PP	2 Hrs
6.	3290406	DLC	Programming Lab	-	-	-	-	40	30	30	30	-	-	4	2	offline	SO	
7.	2000XX	CLC	Novel engaging courses	-	-	-	-	50	-	-	-	-	-	2	1	Online and Mentoring	SO	-
Total				250	50	100	100	170	90	90	90	13	02	10	20			
10.		MAC	Indian Constitution and Traditional Knowledge	50	10	20	20	-	-	-	-	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
11.	3000005	Natural Science & Skills	Environmental Engineering	50	10	20	20	-	-	-	-	2	-	-	GRADE	Blended	MCQ	1.5 Hrs

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



Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Engineering / Language Credits of Natural Sciences & Skills will be added in the VI Semester

AO: Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral

MCQ: Multiple Choice Question

Modes of Teaching				Mode of Examination				Total Credits
Theory		Lab	NEC	Theory		Lab	SIP/SLP/NEC	
Online	Blended	Offline	Interactive	PP	AO	MCQ	SO	
Online	Offline	Online						
	15	-	1	17	-	-	01	20
	75	-	5	85	-	-	5	Credits %



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-12

Syllabi

B. Tech IV Semester

For batch admitted 2023-24

(Computer Science and Engineering)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Computer Networks
3150401

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 Model.

Unit-II

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

Unit-III

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

Unit-IV

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

Handwritten signatures and marks at the bottom of the page.



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

Unit-V

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

Network Function Virtualization (NFV) - Architecture and Concepts, Programmable Networks - Introduction to P4, SmartNICs and P4 switches, Data Center Networking (DCN) – Introduction, DCN - Deep Dive (Network topologies, Container Network Interfaces)

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students would be able to:

- CO1. Outline the Data Communications System and its components.
- CO2. Identify the different types of network topologies and protocols.
- CO3. Enumerate the layers of the OSI model and function(s) of each layer.
- CO4. Identify the different types of network devices and their functions within a network
- CO5. Analyze the problems associated with various networking protocols and measure the Performance

Handwritten signatures and initials at the bottom of the page.



Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3								2	2			
CO2	3	2	3	3		3		2			3	2	3	
CO3	3	3	3		1						2	3	3	
CO4				2	2	3	1	1	1	1	1		1	
CO5				2	2	3	1	1	1	1	1	1	3	1

1 - Slightly; 2 - Moderately; 3 - Substantially

Handwritten signatures and initials in blue ink, including a large 'A' in a circle, a 'C', and several other stylized signatures.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Computer Networks
2150411(OLD)

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.

[Handwritten signatures and marks at the bottom of the page]



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, Port addressing basics

Unit-V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students would be able to:

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

[Handwritten signatures and marks at the bottom of the page]



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Software Engineering

3150402

COURSE OBJECTIVES

- To understand fundamental concepts of software engineering, including software development life cycles, methodologies, and processes.
- To Develop the ability to systematically gather, analyze, and document software requirements.
- To gain proficiency in software design methodologies and principles, enabling the creation of robust, scalable, and maintainable software architectures.
- To learn and apply various software testing methodologies to ensure software quality and reliability.

Unit-I

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

Unit - II

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

Unit - III

Design Concept, Principle and Methods: Design Fundamentals, Design Principles, Effective Modular Design, Design Representations, Architectural design, Procedural

(Handwritten signatures and marks)



design, data Directed design, Real Time Design, Object Oriented Design, Coupling and Cohesion.

Unit – IV

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

Unit – V

Software Testing: Definitions, Software Testing Life Cycle (STLC), Test Case Design, Strategic Approach to Software Testing- Verification & Validation , Strategic issues, Criteria for completion of Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Black Box Testing Techniques, White Box Testing Techniques, Acceptance Testing, introduction to security aspects and ethical AI in software engineering, Sustainable Software Lifecycle Management.

RECOMMENDED BOOKS

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

Handwritten signatures and initials in blue ink, including a large circled 'A' and various other marks.



COURSE OUTCOMES

After completion of the course students would be able to:

- CO1. **Explain** the various fundamental concepts of software engineering.
- CO2. **Recognize** the importance of requirements engineering in the software development lifecycle
- CO3. **Identify Effective Software Design principles including cohesion and coupling**
- CO4. **Implement** software metrics for estimating the cost, effort, and schedule of software projects.
- CO5. **Examine** various testing techniques based on software requirements and design specifications.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	2	1	1	1	1	1	1	1	3	-
CO2	2	3	3	3	2	1	1	1	1	1	1	1	3	3
CO3	2	2	3	3	2	1	1	1	1	1	1	2	3	3
CO4	3	3	2	2	3	1	1	1	1	1	1	2	3	3
CO5	3	2	2	2	3	1	1	1	1	1	1	3	3	3

1 - Slightly; 2 - Moderately; 3 - Substantially

Handwritten signatures and initials in blue ink, likely representing faculty or administrative approval.



Department of Computer Science and Engineering
DATA MINING & WAREHOUSING
3150403

COURSE OBJECTIVES:

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

UNIT-1:

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

UNIT-2:

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

UNIT -3:

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

UNIT-4:

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

UNIT -5:

Social Media Mining: Social Network Analysis, Influencer Detection, Data Warehousing in Cloud: Google BigQuery, Amazon Redshift, Microsoft Azure Synapse, Data Lake Concepts: Data Lake vs Data Warehouse, Tools (Hadoop, Databricks), Integration with AI and ML: Predictive Analytics,

[Handwritten signatures and marks at the bottom of the page]



Real-time Analytics using warehousing tools, Project-Based Learning: Mini projects in applications like customer segmentation and recommendation systems etc.

RECOMMENDED BOOKS

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

COURSE OUTCOMES:

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

CO 1. **Understand** the Fundamentals of Data Mining.

CO2. **Apply** data mining techniques to extract actionable insights and patterns..

CO3. **Understand** and Design Data Warehouse Architectures.

CO4. **Apply** the Apriori Algorithm for Single-Dimensional Rule Mining.

CO5. **Utilize** Cloud Data Warehousing Tools.

CO-PO mapping

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1- CO1	3	3		3								3	3	3
CO2	3	3	2	3	3		3		2			3	2	3
CO3	3	3	3	3								2	3	3
CO4	3	3	3	3						2		3	2	2
CO5	3	3	3	3	3				3			3	3	3

Slightly; 2 - Moderately; 3 - Substantially

(Handwritten signatures and initials in blue ink)



DATA MINING & WAREHOUSING 2150413(OLD)

COURSE OBJECTIVES:

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

Unit-1:

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

Unit-2:

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

UNIT -3:

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

UNIT-4:

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

UNIT -5:

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

(Handwritten signatures and marks at the bottom of the page)



RECOMMENDED BOOKS

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

COURSE OUTCOMES:

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

- CO 1. **Classify** various databases systems and data models of data warehouse.
- CO2. **Compare** various methods for storing & retrieving data from different data sources/repository.
- CO3. **Apply** pre-processing techniques for construction of data warehouse.
- CO4. **Analyze** data mining for knowledge discovery & prediction.
- CO5. **Explain** data mining methods for identification of association for transactional databases.
- CO6. **Develop** various classification and clustering algorithms for data using data mining.

Handwritten signatures and initials in blue ink, including a circled 'A' and various scribbles.



Department of Computer Science and Engineering
Theory of Computation
3150404

COURSE OBJECTIVES

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

Unit-I

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

Unit-II

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

Unit-III

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

Unit-IV

Turing Machine: Techniques for construction. Linear bounded automata, Church Turing Thesis, Encoding of Turing Machine, Universal Turing machine Multitape, multihead and multidimensional Turing machine, N-P complete problems. Decidability and Recursively Enumerable Languages, decidability, decidable languages, undecidable languages, Halting problem of Turing machine & the post correspondence problem (PCP).





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 the course students would be able to:

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

CO2. Compute abstract models of computing and check their power to recognize the languages.

CO3. Analyse the grammar, its types, simplification and normal form.

CO4. Design mathematical models to prove properties of languages, grammars and automata.

CO5. Apply automata theory, languages and computation in engineering application.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1			3	2								
CO2	1		3	3	2		3		2				1	2
CO3		1		2	2	3			2			2	2	2
CO4			1	1	1	2			2			2	1	2
CO5				1	2	2						1	2	1

Slightly; 2 - Moderately; 3 - Substantially

1-



Department of Computer Science and Engineering
Theory of Computation
2150414(OLD)

COURSE OBJECTIVE

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

Unit-I

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

Unit-II

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

Unit-III

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

Unit-IV

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





Unit-V

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

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.





माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Department of Computer Science and Engineering
Artificial Intelligence & Neural Network
3150405

COURSE OBJECTIVES

- Identify the problems where AI is required and the different methods available.
- Compare and contrast different AI techniques available.
- Define and explain learning algorithms
- Learn knowledge representation techniques and their importance in AI.
- Familiarize students with neural networks and their architectures, focusing on learning laws and activation functions.

Unit: 1

Introduction: Need and Scope of Artificial Intelligence, History, Definition of Artificial Intelligence, Task and Objectives of Artificial Intelligence, Techniques of Artificial Intelligence. Artificial Intelligence Problems: Problems Definition, Problem Spaces and Production System. Characteristics of Production Systems, Types of Production System. Control Strategies, Example: water-jug, 8 – Puzzle, Cannibals & Missionaries problems.

Unit: 2

Agent: Introduction, Types of Agent, Searching techniques: Uninformed search, Breadth search and Depth first search, Depth limited Search, Informed (Heuristic) Search: Best-First Search, A* Algorithm, AO*, Simulated Annealing, Measure of performance and analysis of search algorithms, Constraint Satisfaction Problems, Adversarial Search.

Unit: 3

Knowledge Representation: Game playing, Definition and importance of Knowledge, Approaches to knowledge Representation, Issues in Knowledge Representation, Procedural and Declarative Knowledge, Knowledge Representation Techniques: Logics, Propositional Logic, Predicate Logic, Semantic networks.

Unit: 4

Introduction to Neural Networks: Terminology and Comparison of Artificial Neural Networks vs. Biological Neural Networks. Learning Laws: Memory-Based Learning, Delta Learning, Perceptron Learning, Competitive Learning, and Boltzmann Learning Rule. Activation Functions: Binary Step, Linear, and Non-Linear Activation Functions.

[Handwritten signatures and marks at the bottom of the page]



Unit: 5

Models and Architectures of Neural Networks, Models of Neuron: McCulloch-Pitts Model, Hebb Net, Feedback Networks: Backpropagation Algorithm and Generalization, Single layer & Multi-Layer Perceptron.

RECOMMENDED BOOKS

- Russell, S.J. and Norvig, P., Artificial Intelligence: A Modern Approach, Pearson Education.
- Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", McGraw Hill.
- Simon Haykin, "Neural Networks and Learning Machines", 3rd edition, pearson education, 2008
- S. N. Sivanandam, S. N. Deepa, "Principles of Soft Computing", 2nd Edition

COURSE OUTCOMES

After completion of the course students would be able to:

CO1. Identify the AI based problems

CO2. Apply techniques to solve the AI problems

CO3. Define learning and explain various learning techniques

CO4. Discuss the concepts and architectures of Neural Networks.

Handwritten signatures and initials in blue ink, including a large 'C' and various scribbles.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2										3	2
CO2	3	3	3	2									3	2
CO3	3	2	2	1									2	3
CO4	3	3		2									3	3
CO5	2	2								2				2

1 - Slightly; 2 - Moderately; 3 - Substantially

Handwritten signatures and initials in blue ink.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under District Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Department of Computer Science and Engineering
Programming Lab (Java Programming)
3150406

COURSE OBJECTIVES

- To understand fundamentals of Java programming such as variables, conditional and iterative execution, and methods.
- To understand fundamentals of object-oriented programming in Java, including defining Classes, invoking methods, using class libraries.
- To create a computer program to solve specified real world problems.

Unit 1

Introduction to Java Programming, Introduction to Java and its features, Java Development Kit (JDK) installation and setup, Java development environment (IDE) usage, Java syntax and basic programming concepts, Variables, data types, and operators, Control structures: decision-making and loops

Unit 2

Object-Oriented Programming in Java, Object-oriented programming (OOP) concepts: classes, objects, inheritance, polymorphism, and encapsulation, Java classes and objects, Constructors and methods, Inheritance and interfaces, Packages and access control.

Unit 3

Exception Handling and File Handling, Exception handling: try-catch blocks, multiple catch clauses, and exception hierarchy, Throwing and catching exceptions, File I/O operations: reading from and writing to files, Working with streams and readers/writers, File handling best practices and error handling

Unit 4

Java Collections Framework, Overview of Java Collections Framework (JCF), Lists, Sets, and Maps in JCF, ArrayList, LinkedList, HashSet, TreeSet, HashMap, TreeMap, etc., Working with collections: adding, retrieving, updating, and deleting elements, Iterators and iterating over collections

Unit 5

Multithreading and Java GUI Programming, Multithreading concepts: threads, synchronization, and inter-thread communication, Creating and managing threads in Java,

(Handwritten signatures and marks at the bottom of the page)



Thread synchronization and deadlock prevention, Introduction to Java GUI (Graphical User Interface) programming Event-driven programming and handling GUI events, Swing components and layout management

Reference Books

1. "Java: A Beginner's Guide" by Herbert Schildt (McGraw-Hill Education)
2. "Effective Java" by Joshua Bloch (Addison-Wesley Professional)
3. "Head First Java" by Kathy Sierra and Bert Bates (O'Reilly Media)
4. "Java: The Complete Reference" by Herbert Schildt (McGraw-Hill Education)
5. "Java Concurrency in Practice" by Brian Goetz et al. (Addison-Wesley Professional)

Course Outcomes

After completion of the course students would be able to:

CO1. Apply object-oriented programming principles, including inheritance, polymorphism, and encapsulation, to design and implement robust Java applications.

CO2. Utilize the Java Collections Framework to effectively manage and manipulate data structures, such as lists, sets, and maps.

CO3. Create interactive graphical user interfaces (GUI) using Java Swing components, incorporating event-driven programming to enhance user experience.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2										3	2
CO2	2	2	3	2									3	2
CO3				2					2				2	2

1 - Slightly; 2 - Moderately; 3 - Substantially



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-13

Syllabi

B. Tech IV Semester

For batch admitted 2023-24

(Computer Science and Design)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Web Technologies

3290401

COURSE OBJECTIVES:

- To learn about the communication model and web architecture.
- To impart the design, development and implementation of Web Pages.
- To develop programs for Web using Scripting Languages.

Unit – I:

Introduction to the Internet: The World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, Domains, Protocols, Hypertext Transfer Protocol, Internet Protocol, IP address, MAC Address, 3-Tier web architecture, Brief Overview of OSI models, web browser, Static and Dynamic web pages.

Unit – II:

HTML: Basic Syntax of HTML, Elements, Attributes, heading, paragraph, styles, formatting, comments, colors, links, images, tables, lists, forms, media.

Unit – III:

Cascading Style Sheets: Introduction to CSS, Syntax, Selectors, Box Model, Inline, internal and External CSS, colors, borders, margin, padding z-index.

Unit – IV:

The Basics of JavaScript: Introduction to javascript, syntax, comments, variables, constants, operators, data types, objects, strings, arrays, if else, switch, loops, function.

Unit – V:

PHP&MYSQL: Introduction to php, syntax, comments, variables, echo, datatypes, strings, operators, if else, switch, loops, function, arrays. Introduction to MySQL, clauses and simple query using select, where, order by, min max, count, avg, sum, like, alias, in., How to create website using

[Handwritten signatures and marks in blue ink at the bottom of the page]



menu icon, tabs, navigations, search bar, Introduction to Content Management Systems (CMS) such as wordpress, joomla.

RECOMMENDED BOOKS:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India Efficient
2. Web Technologies, Black Book, dreamtech Press
3. Web Technologies, Achyut Godbole, Atul Kahate, Tata McGraw-Hill
4. Principles of Web Design, Joel Sklar, Cengage Learning

COURSE OUTCOMES: After completing the course, the student will be able to:

CO1: Distinguish among various web designing technologies for website development

CO2: Construct webpages using HTML and CSS

CO3: Model website using JavaScript and PHP

CO4: Design Static and Dynamic website

CO5: Explain the working of web pages and data retrieval

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	2	2	1	1	1	1	1	1	2	3	-
CO2	3	2	2	2	1	1	1	1	1	1	1	1	3	3
CO3	2	2	2	2	3	1	1	1	1	1	1	2	3	3
CO4	2	2	3	2	2	2	1	1	1	1	1	3	3	3
CO5	3	2	2	2	1	1	1	1	1	1	1	3	3	-

1 - Slightly; 2 - Moderately; 3 - Substantially

[Handwritten signatures and initials]



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Web Technologies

2290401(OLD)

COURSE OBJECTIVES:

- To learn about the communication model and web architecture.
- To impart the design, development and implementation of Web Pages.
- To develop programs for Web using Scripting Languages.

Unit – I:

Introduction to the Internet: The World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, Domains, Protocols, Hypertext Transfer Protocol, Internet Protocol, IP address, MAC Address, 3-Tier web architecture, Brief Overview of OSI models, web browser, Static and Dynamic web pages.

Unit – II:

HTML: Basic Syntax of HTML, Elements, Attributes, heading, paragraph, styles, formatting, comments, colors, links, images, tables, lists, forms, media.

Unit – III:

Cascading Style Sheets: Introduction to CSS, Syntax, Selectors, Box Model, Inline, internal and External CSS, colors, borders, margin, padding z-index.

Unit – IV:

The Basics of JavaScript: Introduction to javascript, syntax, comments, variables, constants, operators, data types, objects, strings, arrays, if else, switch, loops, function.

Unit – V:

PHP&MYSQL: Introduction to php, syntax, comments, variables, echo, datatypes, strings, operators, if else, switch, loops, function, arrays. Introduction to MySQL, clauses and simple query using select, where, order by, min max, count, avg, sum, like, alias, in., How to create website using menu icon, tabs, navigations, search bar.

[Handwritten signatures and marks at the bottom of the page]



RECOMMENDED BOOKS:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India Efficient
 2. Web Technologies, Black Book, dreamtech Press
 3. Web Technologies, Achyut Godbole, Atul Kahate, Tata McGraw-Hill
 4. Principles of Web Design, Joel Sklar, Cengage Learning
-

COURSE OUTCOMES: After completing the course, the student will be able to:

CO1: Distinguish among various web designing technologies for website development

CO2: Construct webpages using HTML and CSS

CO3: Model website using JavaScript and PHP

CO4: Design Static and Dynamic website

CO5: Explain the working of web pages and data retrieval

Handwritten signatures in blue ink, likely representing faculty members or students, scattered across the bottom of the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालिपर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Microprocessor Design & Interfacing

3290402

UNIT I:

Technological trends, measuring performance: MIPS, CPI/IPC, Benchmark suite, Geometric and Arithmetic means, Speed up, Amdahl's law, Introduction to Microprocessor Systems, Historical development, Basic architecture and components, Overview of different microprocessor families, Microprocessor vs. Microcontroller.

UNIT II:

Introduction of 8085 Microprocessor: Architecture of 8085 processor. Register Architecture: Accumulator, Temporally Register and Flag Register. Program Counter, Stack pointer and Instruction register. Addressing Modes: Direct addressing mode and Register direct Addressing Mode. Register Indirect Addressing Mode, Immediate Addressing Mode and Implicit or Implied Addressing Mode.

UNIT III:

Introduction to Assembly Language Programming: Various Instructions Classifications: Instruction Format, Opcode, Operand and Hex code. Instruction Operation Status, Various Instruction Sets: Data Transfer Group Instructions, Arithmetic Group Instructions, Logical Group Instruction, Branch Group Instructions: Conditional and Unconditional and Machine control Instructions.

UNIT IV:

Parallel Computing: Flynn's Classification of Computer Architecture, Types of Parallelism, Parallel programming models. Multi processors and multi computers, Shared memory organization- Interleaved memory organization, CISC and RISC scalar processors- Super scalar processors-VLIW architecture- Multivector and SIMD computers.

UNIT V:

Intel's 14th Gen Core Processors, AMD's Ryzen 7000 series, chiplet-based designs, Intel's Meteor Lake, Intel's Alder Lake and Raptor Lake, quantum processors and neuromorphic chips.





माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Recommended Books:

1. Elmars, Navathe, Somayajulu, Gupta, "Fundamental of Database Systems", 4th Edition, Pearson Education, 2007
2. R Ramakrishnan, "Database Management Systems", McGraw Hill International Editions, 1998
3. Date, Kannan, Swaminathan, "An Introduction to Database Systems", 8th Edition Pearson Education, 2007.
4. Silberschatz, Korth, Sudarshan, "Database System Concepts", McGraw Hill 6th Edition. 2006

COURSE OUTCOMES

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

- CO1: Apply suitable assembly code for different problems.
- CO2: Apply and Understand Assembly Language Instructions.
- CO3: Analyse the metrics for measuring microprocessor performance.
- CO4: Evaluate the architecture and classify the instruction set of 8085/8086 microprocessor.
- CO5: Understand the latest technologies involved in the microprocessors.

Handwritten signatures and initials in blue ink, including "AB", "R", "S", "P", "X", and others, scattered across the bottom right of the page.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SOFTWARE ENGINEERING

3290403

COURSE OBJECTIVES

- To understand fundamental concepts of software engineering, including software development life cycles, methodologies, and processes.
- To Develop the ability to systematically gather, analyze, and document software requirements.
- To gain proficiency in software design methodologies and principles, enabling the creation of robust, scalable, and maintainable software architectures.
- To learn and apply various software testing methodologies to ensure software quality and reliability.

Unit-I

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

Unit - II

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

Unit - III

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

[Handwritten signatures and initials in blue ink]



Unit – IV

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

Unit – V

Software Testing: Definitions, Software Testing Life Cycle (STLC), Test Case Design, Strategic Approach to Software Testing- Verification & Validation , Strategic issues, Criteria for completion of Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Black Box Testing Techniques, White Box Testing Techniques, Acceptance Testing, introduction to security aspects and ethical AI in software engineering, Sustainable Software Lifecycle Management.

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students would be able to:

- CO1. **Explain** the various fundamental concepts of software engineering.
- CO2. **Recognize** the importance of requirements engineering in the software development lifecycle
- CO3. **Identify Effective Software Design principles including cohesion and coupling**
- CO4. **Implement** software metrics for estimating the cost, effort, and schedule of software projects.
- CO5. **Examine** various testing techniques based on software requirements and design specifications.

Handwritten signatures and initials at the bottom of the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE



Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	2	1	1	1	1	1	1	1	3	-
CO2	2	3	3	3	2	1	1	1	1	1	1	1	3	3
CO3	2	2	3	3	2	1	1	1	1	1	1	2	3	3
CO4	3	3	2	2	3	1	1	1	1	1	1	2	3	3
CO5	3	2	2	2	3	1	1	1	1	1	1	3	3	3

1 - Slightly; 2 - Moderately; 3 - Substantially

[Handwritten signatures and initials in blue ink]



Department of Computer Science and Engineering

Theory of Computation

3290404

COURSE OBJECTIVES

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

COURSE OBJECTIVES

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

Unit-I

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

Unit-II

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

Unit-III

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

Unit-IV

Turing Machine: Techniques for construction. Linear bounded automata, Church Turing Thesis, Encoding of Turing Machine, Universal Turing machine Multitape, multithread and





multidimensional Turing machine, N-P complete problems. Decidability and Recursively Enumerable Languages, decidability, decidable languages, undecidable languages, Halting problem of Turing machine & the post correspondence problem (PCB).

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 the course students would be able to:

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

CO2. Compute abstract models of computing and check their power to recognize the languages.

CO3. Analyse the grammar, its types, simplification and normal form.

CO4. Design mathematical models to prove properties of languages, grammars and automata.

CO5. Apply automata theory, languages and computation in engineering application.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1			3	2								
CO2	1		3	3	2		3		2				1	2
CO3		1		2	2	3			2			2	2	2
CO4			1	1	1	2			2			2	1	2
CO5				1	2	2						1	2	1

1 - Slightly; 2 - Moderately; 3 - Substantial

(Handwritten signatures and marks)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Computer Networks

3290405

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.

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.

[Handwritten signatures and marks in blue ink at the bottom of the page]



Unit-III

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

Unit-IV

Network Layer & Transport Layer: Introduction, Design issues, Services, Routing- Distance vector routing, Hierarchical routing, Link state routing, Shortest path algorithm- Dijkstra's Algorithm & Floyd-Warshall's Algorithm, Flooding, Congestion Control- Open Loop & Closed Loop Congestion Control, Leaky Bucket & Token bucket Algorithm, Connection Oriented & Connectionless Service, Port addressing basics

Unit-V

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

Network Function Virtualization (NFV) - Architecture and Concepts, Programmable Networks - Introduction to P4, SmartNICs and P4 switches, Data Center Networking (DCN) – Introduction, DCN - Deep Dive (Network topologies, Container Network Interfaces)

RECOMMENDED BOOKS

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

Handwritten signatures and initials at the bottom of the page.



COURSE OUTCOMES

After completion of the course students would be able to:

- CO1. Outline the Data Communications System and its components.
- CO2. Identify the different types of network topologies and protocols.
- CO3. Enumerate the layers of the OSI model and function(s) of each layer.
- CO4. Identify the different types of network devices and their functions within a network
- CO5. Analyze the problems associated with various networking protocols and measure the Performance

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1 - CO1	1	3												
CO2			2				3						1	
CO3					2							2	2	
CO4					1								1	
CO5					2							1	3	1

Slightly; 2 - Moderately; 3 - Substantially

Handwritten signatures and initials in blue ink, including a large circular stamp with a cross inside, and several other marks.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Computer Networks

2290405(OLD)

COURSE OBJECTIVES

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

Unit-I

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

Unit-II

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

Unit-III

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

Unit-IV

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

[Handwritten signatures and marks at the bottom of the page]



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

Unit-V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students would be able to:

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



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Programming Lab (Java Programming)

3290406

COURSE OBJECTIVES

- To understand fundamentals of Java programming such as variables, conditional and iterative execution, and methods.
- To understand fundamentals of object-oriented programming in Java, including defining Classes, invoking methods, using class libraries.
- To create a computer program to solve specified real world problems.

Unit 1

Introduction to Java Programming, Introduction to Java and its features, Java Development Kit (JDK) Installation and setup, Java development environment (IDE) usage, Java syntax and basic programming concepts, Variables, data types, and operators, Control structures: decision-making and loops

Unit 2

Object-Oriented Programming in Java, Object-oriented programming (OOP) concepts: classes, objects, inheritance, polymorphism, and encapsulation, Java classes and objects, Constructors and methods, Inheritance and interfaces, Packages and access control

Unit 3

Exception Handling and File Handling, Exception handling: try-catch blocks, multiple catch clauses, and exception hierarchy, Throwing and catching exceptions, File I/O operations: reading from and writing to files, Working with streams and readers/writers, File handling best practices and error handling

Unit 4

Java Collections Framework, Overview of Java Collections Framework (JCF), Lists, Sets, and Maps in JCF, ArrayList, LinkedList, HashSet, TreeSet, HashMap, TreeMap, etc., Working

Handwritten signatures and initials in blue ink.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Programming Lab (Java Programming)

3290406

COURSE OBJECTIVES

- To understand fundamentals of Java programming such as variables, conditional and iterative execution, and methods.
- To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- To create a computer program to solve specified real world problems.

Unit 1

Introduction to Java Programming, Introduction to Java and its features, Java Development Kit (JDK) installation and setup, Java development environment (IDE) usage, Java syntax and basic programming concepts, Variables, data types, and operators, Control structures: decision-making and loops

Unit 2

Object-Oriented Programming in Java, Object-oriented programming (OOP) concepts: classes, objects, inheritance, polymorphism, and encapsulation, Java classes and objects, Constructors and methods, Inheritance and interfaces, Packages and access control.

Unit 3

Exception Handling and File Handling, Exception handling: try-catch blocks, multiple catch clauses, and exception hierarchy, Throwing and catching exceptions, File I/O operations: reading from and writing to files, Working with streams and readers/writers, File handling best practices and error handling

Unit 4

Java Collections Framework, Overview of Java Collections Framework (JCF), Lists, Sets, and Maps in JCF, ArrayList, LinkedList, HashSet, TreeSet, HashMap, TreeMap, etc., Working

Handwritten signatures and initials in blue ink, including a large circular signature on the left and several smaller ones on the right.



with collections: adding, retrieving, updating, and deleting elements, iterators and iterating over collections

Unit 5

Multithreading and Java GUI Programming, Multithreading concepts: threads, synchronization, and inter-thread communication, Creating and managing threads in Java, Thread synchronization and deadlock prevention, Introduction to Java GUI (Graphical User Interface) programming Event-driven programming and handling GUI events, Swing components and layout management

Reference Books

1. "Java: A Beginner's Guide" by Herbert Schildt (McGraw-Hill Education)
2. "Effective Java" by Joshua Bloch (Addison-Wesley Professional)
3. "Head First Java" by Kathy Sierra and Bert Bates (O'Reilly Media)
4. "Java: The Complete Reference" by Herbert Schildt (McGraw-Hill Education)
5. "Java Concurrency in Practice" by Brian Goetz et al. (Addison-Wesley Professional)

Course Outcomes

After completion of the course students would be able to:

- CO1. Apply object-oriented programming principles, including inheritance, polymorphism, and encapsulation, to design and implement robust Java applications.
- CO2. Utilize the Java Collections Framework to effectively manage and manipulate data structures, such as lists, sets, and maps.
- CO3. Create interactive graphical user interfaces (GUI) using Java Swing components, incorporating event-driven programming to enhance user experience.

Handwritten notes in blue ink:
A circle with a diagonal line through it, followed by a series of scribbles and arrows, possibly representing a diagram or a flowchart.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-14

Experiment list/Skill based mini-project

B. Tech IV Semester

For batch admitted 2023-24

(Computer Science and Engineering)



महाव एंग्लोमित्री एवं विज्ञान संस्थान, मालविका (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

Seemed to be University

(Inclined under Business Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ GRADE



Computer Networks

3150401

List of Experiments

1. Basic Network Configuration

- Setting up a local area network (LAN) using routers and switches.
- Configuring static IP addresses and testing connectivity using ping and `tracert/traceroute`.
- Verifying network connectivity with tools like `netstat`, `arp`, and `ipconfig/ifconfig`.

2. Protocol Implementation and Analysis

- **TCP/UDP Socket Programming:** Writing client-server programs for data exchange.
- Understanding and simulating the **handshake process in TCP**.
- Packet sniffing and analysis using tools like Wireshark.

3. Network Simulation

- Simulating networks with tools like Cisco Packet Tracer, NS3, or GNS3.
- Setting up and analyzing **routing protocols** (e.g., RIP, OSPF, EIGRP).

4. Routing and Switching

- Configuring routers and switches for VLANs.
- Setting up and verifying **static routing** and **dynamic routing protocols**.
- Troubleshooting network connectivity issues with routing tables.

5. Application Layer Experiments

- Setting up web servers and file servers (e.g., Apache, NGINX, or FTP servers).
- Configuring and testing DNS and DHCP servers.

Handwritten signatures and initials in blue ink, including a large circular signature on the left and several smaller ones on the right.



राष्ट्रीय रक्षा विश्वविद्यालय, वाशिंगटन (ए.एस.), भारत
RASHTRIYA INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

Deemed to be University

(Declared under District Enquiry by Ministry of Education, Government of India)

NARC ACCREDITED WITH A++ GRADE



2025-26

6. Network Security

- Implementing firewalls and configuring access control lists (ACLs).
- Setting up secure connections using VPNs.
- Analyzing and mitigating common network attacks (e.g., ARP spoofing, DDoS attacks).

7. Network Performance Analysis

- Measuring latency, throughput, and packet loss using tools like iperf.
- Monitoring bandwidth usage and network performance using tools like Nagios, Zabbix, or SolarWinds.





Computer Networks

3150401

List of Skill Based Mini Project

1. Develop a simple client-server chat system using TCP or UDP.
2. Create a tool that mimics the working of the ping command, including ICMP packet creation and response handling.
3. Build a tool to calculate subnets, including network IDs, broadcast addresses, and usable host ranges.
4. Create an application that resolves domain names to IP addresses without using the system DNS.
5. Build a basic HTTP server to serve static web pages.
6. Develop a file-sharing system using TCP sockets.
7. Implement a packet-capturing application using Python's scapy or similar libraries.
8. Create an application to measure network bandwidth and latency.
9. Build a tool to monitor active connections, traffic usage, or specific port activity.
10. Design a basic firewall to block specific IPs or ports using Python or Linux iptables.
11. Build a basic brute force or dictionary attack tool for ethical hacking purposes (on test cases).
12. Create a tool that detects ARP spoofing attacks in a network.
13. Develop a system to stream video over UDP or TCP.

(Handwritten signatures and marks)



DATA MINING & WAREHOUSING

3150403

List of Experiment

1. Installation of WEKA Tool
2. Creating new Arff File
3. Data Processing Techniques on Data set
4. Data cube construction – OLAP operations
5. Implementation of Apriori algorithm
6. Implementation of FP- Growth algorithm
7. Implementation of Decision Tree Induction
8. Calculating Information gains measures
9. Classification of data using Bayesian approach
10. Implementation of K-means algorithm
11. Build Data Warehouse and Explore WEKA
12. Case study of open source data mining tools (WEKA, ORANGE & TERADATA)

Handwritten signatures and initials in blue ink, including a large 'A' and various initials like 'K', 'D', 'S', 'P', 'R', 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z'.



DATA MINING & WAREHOUSING

3150403

List of Skill Based Mini Project

1. Develop a housing price predictions
2. Develop a smart health disease prediction using Naive Bayes
3. Develop a handwritten digit recognition system
4. Develop a movie recommendation system
5. Develop a breast cancer detection
6. Build Data Warehouse/Data Mart (using open source tools like Pentaho Data Integration Tool, Pentaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects, etc.)
7. Develop a Credit Risk Assessment system
8. Develop a sales forecasting using Walmart dataset
9. Develop a D-mart sales prediction
10. Develop a Music recommendation system
11. Develop a system for detecting suicidal tendency
12. Develop a weather forecasting using data mining
13. Develop a customer behaviour prediction using web usage mining

Handwritten signatures and initials in blue ink, including a large circular signature on the left and several smaller signatures and initials on the right.



Programming Lab (Java Programming)

3150406

List of Experiments

Experiment 1: Setting up the Java Development Environment

- Install the Java Development Kit (JDK) and an Integrated Development Environment (IDE).
- Write a simple "Hello, World!" program and execute it.

Experiment 2: Implementing Basic Control Structures

- Write a program that demonstrates the use of if-else statements for decision-making.
- Implement loops (for, while) to iterate over a set of numbers or perform a specific task.

Experiment 3: Creating and Manipulating Objects

- Design a class representing a student with relevant attributes and behaviors.
- Create multiple instances of the class and invoke methods to perform operations on the student objects.

Experiment 4: Inheritance and Polymorphism

- Create a base class and derived classes to showcase inheritance.
- Demonstrate polymorphism by invoking methods overridden in derived classes.

Experiment 5: Exception Handling

- Write a program that throws and catches different types of exceptions.
- Handle exceptions using try-catch blocks to prevent program termination.

Experiment 6: File Handling

- Read data from a text file and display its content.
- Write data to a file and verify the successful write operation.

Experiment 7: Working with Java Collections

- Create a collection (e.g., ArrayList) and perform operations like adding, retrieving, and removing elements.
- Iterate over a collection using iterators and demonstrate different collection classes.

Experiment 8: Multithreading

- Create multiple threads and execute them concurrently.
- Implement synchronization mechanisms to prevent thread interference.

[Handwritten signatures and initials in blue and green ink]



Experiment 9: GUI Application Development

- Design a graphical user interface (GUI) using Swing components.
- Implement event handlers for GUI components, such as buttons or text fields.

Experiment 10: Comprehensive Project

- Design and implement a comprehensive Java project that incorporates concepts covered throughout the syllabus.
- Examples could include creating a student management system or a simple game using GUI elements.

Handwritten signatures and initials in blue ink, including a large 'K' in a circle and various other marks.



Programming Lab (Java Programming)

3150406

List of Skill Based Mini Projects

1. Student Management System:
 - Design a console-based application to manage student information.
 - Implement functionalities like adding, deleting, and displaying student records.
2. Library Management System:
 - Create a program to manage library operations, including book borrowing, returning, and searching.
 - Implement data structures to store book records efficiently.
3. Calculator Application:
 - Develop a GUI-based calculator application using Swing components.
 - Implement basic arithmetic operations and handle user input.
4. File Encryption and Decryption:
 - Create a program to encrypt and decrypt files using encryption algorithms.
 - Provide options for the user to select the encryption method and specify the file to encrypt/decrypt.
5. Quiz Application:
 - Develop a quiz application that presents multiple-choice questions to the user.
 - Implement a scoring system and display the result at the end of the quiz.
6. Bank Account Management System:
 - Design a program to manage bank accounts, including features like account creation, deposit, withdrawal, and balance inquiry.
 - Implement object-oriented concepts to model bank accounts and transactions.
7. Contact Management Application:
 - Develop a console-based application to manage contacts.
 - Implement functionalities like adding contacts, searching by name, and displaying contact details.
8. Tic-Tac-Toe Game:
 - Create a GUI-based Tic-Tac-Toe game using Swing components.
 - Implement game logic to handle player turns and determine the winner.
9. Weather Forecast Application:
 - Develop a program that retrieves weather data from an API and displays it to the user.
 - Implement features like displaying current weather, forecast for multiple days, and location-based search.

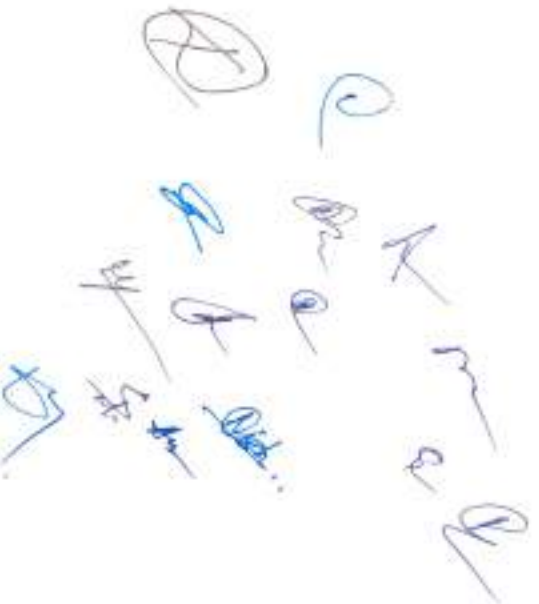


Handwritten notes and signatures in blue ink at the bottom of the page.



10. Online Shopping System:

- Design a simple online shopping system with features like browsing products, adding items to the cart, and placing orders.
- Implement shopping cart functionality and user authentication.





MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)

(Declared Under District Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-15

Experiment list/Skill based mini-project

B. Tech IV Semester

For batch admitted 2023-24

(Computer Science and Design)



Web Technologies

3290401

List of Experiments

1. Write HTML program to learn various tags.
2. Write HTML program to change color and style of the content.
3. Write HTML program to open the MITS college web page using links.
4. Write HTML program to demonstrate list.
5. Write HTML program to demonstrate table.
6. Write HTML program to demonstrate forms.
7. Write HTML program to insert image.
8. Create a webpage with HTML describing your department use paragraph, list tags and images.
9. Write programs to learn inline, internal and external CSS.
10. Write CSS programs to understand various selectors.
11. Write CSS programs to demonstrate padding properties.
12. Write CSS programs to insert image using box Model.
13. Write javascript program to print "Hello World."
14. Exploring if-else in javascript.
15. Exploring switch-case in javascript.
16. Create javascript programs with for loop, while and do-while loops
17. Arrays and Strings in Javascript.
18. Functions in Javascript
19. Write javascript program that changes HTML content.
20. Write javascript program that changes HTML attributes.
21. Write javascript program to change the style of HTML elements.
22. Write javascript program to hide the HTML elements.
23. Write javascript program to show hidden HTML elements
24. Write program to demonstrate data types operators and print statement using PHP.
25. Exploring If-else, switch-case in PHP.
26. Exploring switch-case in PHP.
27. Create PHP programs with for loop, while and do-while loops
28. Array and String in PHP.
29. Functions in PHP.
30. Learn simple query using select and where clause.
31. Learn simple query using order by, min, max, count, avg, sum, like, alias, in keywords.

Handwritten signatures and initials in blue ink.



Web Technologies

3290401

List of Skill Based Mini Projects

1. Create a website for Conference
2. Create a website for Music Portfolio
3. Create a website for Photography Site
4. Create a website for Personal Portfolio
5. Create a website for Technical Documentation
6. Create a website containing all information for a person you admire.
7. Create a website for auction purpose
8. Create a e-commerce website
9. Create a website for books lover.
10. Create a website for online food delivery system





महाविद्यालयीय प्रौद्योगिकी विभाग, मध्य प्रदेश (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GUNDEL (M.P.), INDIA

Deemed to be university
(Established under Section 3 of the University Grants Commission Act, 1956)

MADE ACCREDITED WITH A++ GRADE



Microprocessor Design & Interfacing

3290402

List of Experiments

1. Basic 8085 Microprocessor Architecture
2. 8085 Assembly Program to Add Two Numbers
3. 8085 Program to Subtract Two Numbers
4. 8085 Program to Multiply Two Numbers (Using Repeated Addition)
5. 8085 Program to Find the Largest of Three Numbers
6. 8085 Program to Check for Even or Odd Number
7. 8085 Program to Find Factorial of a Number
8. 8086 Program to Add Two 16-bit Numbers
9. 8086 Program to Multiply Two 16-bit Numbers
10. 8086 Program to String Length Calculation
11. 8086 Program to Reverse a String
12. 8086 Program to Sort an Array

Handwritten notes and signatures in blue ink, including a large circled 'A' and various initials and marks.



Microprocessor Design & Interfacing

3290402

List of Skill Based Mini Projects

1. Traffic Light Control Using 8086
2. Temperature Control System Using 8086
3. Automated Irrigation System Using 8086
4. Smart Home Automation System Using 8086
5. Matrix Keypad and LCD Interface Using 8086
6. Simple Binary Counter
7. LED Blinking at a regular interval
8. Simple Switch-based Alarm System
9. Displaying a Single Character on 7-Segment Display
10. Simple Digital Stopwatch

Handwritten signatures and initials in blue ink, including a large circular signature at the top left and several smaller initials and signatures below it.



महाविद्यालय प्रौढ विज्ञान, एम्.टी.एस.
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed to be University
(Incorporated under Section 3 of the University Grants Commission Act, 1956)
NAAC ACCREDITED WITH A++ GRADE



Microprocessor Design & Interfacing

3290402

List of Skill Based Mini Projects

1. Traffic Light Control Using 8086
2. Temperature Control System Using 8086
3. Automated Irrigation System Using 8086
4. Smart Home Automation System Using 8086
5. Matrix Keypad and LCD Interface Using 8086
6. Simple Binary Counter
7. LED Blinking at a regular interval
8. Simple Switch-based Alarm System
9. Displaying a Single Character on 7-Segment Display
10. Simple Digital Stopwatch

Handwritten signatures and initials in blue ink, including a large circular signature at the top left and several smaller initials and marks below it.



Programming Lab (Java Programming)

3290406

List of Experiments

- Experiment 1: Setting up the Java Development Environment
- Install the Java Development Kit (JDK) and an Integrated Development Environment (IDE).
 - Write a simple "Hello, World!" program and execute it.
- Experiment 2: Implementing Basic Control Structures
- Write a program that demonstrates the use of if-else statements for decision-making.
 - Implement loops (for, while) to iterate over a set of numbers or perform a specific task.
- Experiment 3: Creating and Manipulating Objects
- Design a class representing a student with relevant attributes and behaviors.
 - Create multiple instances of the class and invoke methods to perform operations on the student objects.
- Experiment 4: Inheritance and Polymorphism
- Create a base class and derived classes to showcase inheritance.
 - Demonstrate polymorphism by invoking methods overridden in derived classes.
- Experiment 5: Exception Handling
- Write a program that throws and catches different types of exceptions.
 - Handle exceptions using try-catch blocks to prevent program termination.
- Experiment 6: File Handling
- Read data from a text file and display its content.
 - Write data to a file and verify the successful write operation.
- Experiment 7: Working with Java Collections
- Create a collection (e.g., ArrayList) and perform operations like adding, removing, and removing elements.
 - Iterate over a collection using iterators and demonstrate different collection classes.
- Experiment 8: Multithreading
- Create multiple threads and execute them concurrently.
 - Implement synchronization mechanisms to prevent thread interference.
- Experiment 9: GUI Application Development
- Design a graphical user interface (GUI) using Swing components.
 - Implement event handlers for GUI components, such as buttons or text fields.

(Signature)

4

4

4

4

4

4



माधव इंजीनियरिंग एंड टेक्नोलॉजी, एम.पी., भारत
MAHAVI INSTITUTE OF TECHNOLOGY & SCIENCE, GUNDAUR (M.P.), INDIA
Described to be University
Orizindar order: District Changanj by Ministry of Education, Government of India
MAHACERTIFIED WITH A+ GRADE



附錄

Programming Lab (Java Programming)

3290406

List of Experiments

Experiment 1: Setting up the Java Development Environment

- Install the Java Development Kit (JDK) and an Integrated Development Environment (IDE).
- Write a simple "Hello, World!" program and execute it.

Exercises 7: Implementing Basic Control Structures

- Write a program that demonstrates the use of if-else statements for decision-making.
- Implement loops (for, while) to iterate over a set of numbers or perform a specific task.

Experiment 3: Creating and Manipulating Objects

- Design a class representing a student with relevant attributes and behaviors.
- Create multiple instances of the class and invoke methods to perform operations on the student objects.

Experiment 4: Inheritance and Polymorphism

- Create a base class and derived classes to showcase inheritance.
- Demonstrate polymorphism by invoking methods overridden in derived classes.

Experiment 5: Exception Handling

- Write a program that throws and catches different types of exceptions.
- Handle exceptions using try-catch blocks to prevent program termination

Experiment 6: File Handling

- Read data from a text file and display its content.
- Write data to a file and verify the successful write operation.

Experiment 7: Working with Java Collections

- Create a collection (e.g., `ArrayList`) and perform operations like adding, retrieving, and removing elements.

Excerpt 8: Multitasking

- Create multiple threads and execute them concurrently.
- Implement synchronization mechanisms to prevent thread interference

Experiment 9: GUI Application Development

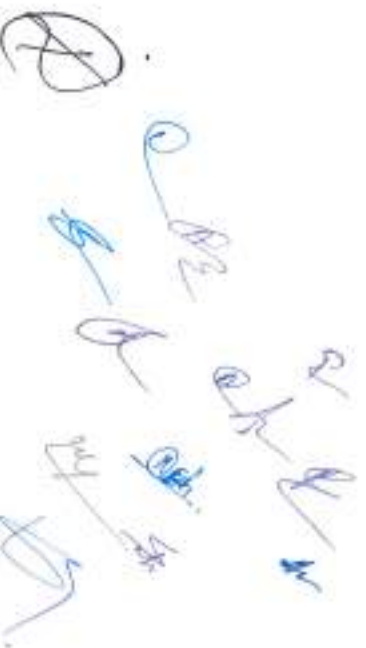
- Design a graphical user interface (GUI) using Swing components.
- Implement event handlers for GUI components, such as buttons or text fields.

- GUI application development
- a graphical user interface (GUI) using Swing components.
- event handlers for GUI components, such as buttons or text fields.



Experiment 10: Comprehensive Project

- Design and implement a comprehensive Java project that incorporates concepts covered throughout the syllabus.
- Examples could include creating a student management system or a simple game using GUI elements.





Experiment 10: Comprehensive Project

- Design and implement a comprehensive Java project that incorporates concepts covered throughout the syllabus.
- Examples could include creating a student management system or a simple game using GUI elements.

Handwritten signatures and initials in blue ink, including a large circular mark and several stylized signatures.



3290406

List of Skill Based Mini Projects

1. Student Management System:
 - Design a console-based application to manage student information.
 - Implement functionalities like adding, deleting, and displaying student records.
2. Library Management System:
 - Create a program to manage library operations, including book borrowing, returning, and searching.
 - Implement data structures to store book records efficiently.
3. Calculator Application:
 - Develop a GUI-based calculator application using Swing components.
 - Implement basic arithmetic operations and handle user input.
4. File Encryption and Decryption:
 - Create a program to encrypt and decrypt files using encryption algorithms.
 - Provide options for the user to select the encryption method and specify the file to encrypt/decrypt.
5. Quiz Application:
 - Develop a quiz application that presents multiple-choice questions to the user.
 - Implement a scoring system and display the result at the end of the quiz.
6. Bank Account Management System:
 - Design a program to manage bank accounts, including features like account creation, deposit, withdrawal, and balance inquiry.
 - Implement object-oriented concepts to model bank accounts and transactions.
7. Contact Management Application:
 - Develop a console-based application to manage contacts.
 - Implement functionalities like adding contacts, searching by name, and displaying contact details.
8. Tic-Tac-Toe Game:
 - Create a GUI-based Tic-Tac-Toe game using Swing components.
 - Implement game logic to handle player turns and determine the winner.
9. Weather Forecast Application:
 - Develop a program that retrieves weather data from an API and displays it to the user.
 - Implement features like displaying current weather, forecast for multiple days, and location-based search.
10. Online Shopping System:

0

Chennai
Anna University
Chennai



गणित प्रौढशिक्षा एवं विज्ञान विभाग, काशीपुर (उ.प्र.), भारत
MAHARAJA INSTITUTE OF TECHNOLOGY & SCIENCE, GHAZIPOUR (U.P.), INDIA
Offered to be University
Discontinued under District Company by Ministry of Education, Government of India
MADE ACCREDITED WITH A++ GRADE



10

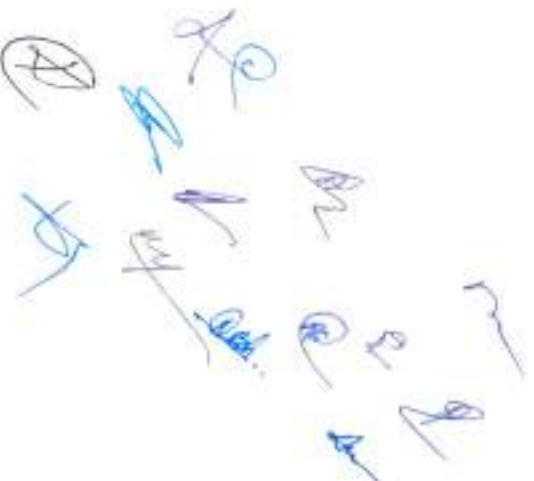
1290406

List of Skill Based Mini Projects

1. **Student Management System:**
 - Design a console-based application to manage student information.
 - Implement functionalities like adding, deleting, and displaying student records.
2. **Library Management System:**
 - Create a program to manage library operations, including book borrowing, returning, and searching.
 - Implement data structures to store book records efficiently.
3. **Calculator Application:**
 - Develop a GUI-based calculator application using Swing components.
 - Implement basic arithmetic operations and handle user input.
4. **File Encryption and Decryption:**
 - Create a program to encrypt and decrypt files using encryption algorithms.
 - Provide options for the user to select the encryption method and specify the file to encrypt/decrypt.
5. **Quiz Application:**
 - Develop a quiz application that presents multiple-choice questions to the user.
 - Implement a scoring system and display the result at the end of the quiz.
6. **Bank Account Management System:**
 - Design a program to manage bank accounts, including features like account creation, deposit, withdrawal, and balance inquiry.
 - Implement object-oriented concepts to model bank accounts and transactions.
7. **Contact Management Application:**
 - Develop a console-based application to manage contacts.
 - Implement functionalities like adding contacts, searching by name, and displaying contact details.
8. **Tic-Tac-Toe Game:**
 - Create a GUI-based Tic-Tac-Toe game using Swing components.
 - Implement game logic to handle player turns and determine the winner.
9. **Weather Forecast Application:**
 - Develop a program that retrieves weather data from an API and displays it to the user.
 - Implement features like displaying current weather, forecast for multiple days, and location-based search.
10. **Online Shopping System:**



- Design a simple online shopping system with features like browsing products, adding items to the cart, and placing orders.
- Implement shopping cart functionality and user authentication.





भाषण प्रौढोन्मेषी एवं विद्वान् संस्थान, म्वालिमर

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, CHALISSON

Digipress University

Department of Psychiatry

Department of Psychiatry
Emory University School of Medicine
 1365 Clifton Road, NE
 Atlanta, Georgia 30309
 Tel: 404/778-3000
 Fax: 404/778-3000
 Email: john.davis@emory.edu

STANC ANDERSON with her brother
Steve Anderson. Photo by L. A. Smith, 1998

WALL ACCEPTED WITH A - 30%
 FROM THE WALL - 10% - 10% - 10% - 10%

STANC ANDERSON with Ann Burke
Stanc Anderson, President, 1-800-368-7225



117154

[illegible]

Annexure-16

CO attainments
(Computer Science and Engineering)



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)
(Declared Under District Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-17

***PO attainment, CO-PO mapping matrix
(Computer Science and Engineering)***

[illegible]

Madhav Institute of Technology & Science Gwalior

Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE ENGINEERING Deemed University

Department :

Computer Science & Engineering

Year 2023-2024

S.No.	Course Code & Name	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	P013	P014
1	150211-Computer System Organization	58.30	42.88	36.73	48.70	28.78	48.30	47.40	58.30	47.96	49.73	41.90	58.88	43.80	30.70
2	150212-Computer Graphics	66.54	58.70	44.88	58.36	40.40	33.36	30.36	30.36	51.61	43.42	43.87	54.88	52.74	31.44
3	150213-Design and Architecture of Algorithms	52.80	65.50	37.81	68.87	25.06	73.46	36.30	61.36	69.80	51.61	77.21	73.84	58.88	73.47
4	150214-Computer Graphics and Multimedia	37.76	60.17	31.10	48.80	28.78	40.54	19.87	47.40	47.96	47.96	36.37	58.28	68.30	62.20
5	150215-Operating System	58.78	66.81	47.78	64.33	49.82	30.36	51.34	27.31	66.12	36.77	46.31	66.28	66.30	73.78
6	150216-Design and Analysis of Algorithms	60.33	64.36	41.49	48.38	58.16	32.80	67.78	40.88	55.53	10.06	45.88	64.86	58.78	64.77
7	150217-Design and Analysis of Algorithm LAM	45.88	45.27	45.44	53.37	31.67	36.83	49.83	36.78	48.88	60.83	41.47	66.36	62.25	62.08
8	150218-Database Management System	66.67	62.38	40.38	43.70	68.88	32.44	54.31	36.80	54.54	58.38	45.18	67.78	58.27	57.67
9	150219-Database Engineering	66.49	58.81	42.31	33.87	36.80	31.05	31.35	40.08	59.76	64.47	45.88	61.88	59.47	54.66
10	150220-Theory of Computation	65.09	59.30	38.82	43.82	46.15	20.88	36.78	58.88	55.36	36.47	43.86	54.38	38.47	64.83
11	150221-Programming Lab Python Programming	60.18	58.51	41.31	53.81	36.55	21.05	37.78	34.13	45.60	48.00	36.77	37.25	47.22	38.42
12	150222-Data Science	70.87	72.77	68.88	43.66	47.81	33.11	36.88	34.13	45.60	37.78	40.54	41.38	46.43	46.78
13	150223-Data Science	68.42	61.82	43.91	50.30	57.78	34.14	33.38	39.42	46.18	46.18	43.27	61.82	55.27	44.78
14	150224-Networking with TCP/IP	66.14	61.41	41.34	56.72	57.67	20.41	46.88	36.80	46.18	46.18	46.18	66.14	58.78	68.88
15	150225-Security	70.30	67.87	42.10	50.70	36.37	32.13	68.04	41.30	53.72	46.78	42.31	60.84	62.32	64.23
16	150226-Computer Design	66.83	60.28	40.06	46.70	73.88	38.06	54.75	20.58	43.87	46.78	46.78	66.14	47.88	46.28
17	150227-Artificial Intelligence	68.42	60.82	56.36	51.80	30.30	47.47	24.83	24.11	31.78	25.53	46.45	66.14	58.25	34.65
18	150228-Networking with TCP/IP	66.14	61.41	41.34	56.72	57.67	20.41	46.88	36.80	46.18	46.18	46.18	66.14	58.78	68.88
19	150229-Security	70.30	67.87	42.10	50.70	36.37	32.13	68.04	41.30	53.72	46.78	42.31	60.84	62.32	64.23
20	150230-Computer Design	66.83	60.28	40.06	46.70	73.88	38.06	54.75	20.58	43.87	46.78	46.78	66.14	47.88	46.28
21	150231-Artificial Intelligence	68.42	60.82	56.36	51.80	30.30	47.47	24.83	24.11	31.78	25.53	46.45	66.14	58.25	34.65
22	150232-Software Engineering LAM	66.42	46.27	32.24	41.23	27.42	38.30	36.83	31.94	46.17	33.38	36.88	47.42	38.47	48.88
23	150233-Microprocessor and interfacing LAM	51.83	38.62	28.88	46.34	30.87	25.49	48.08	31.80	33.44	41.85	36.78	47.42	38.47	48.88
24	Machine Learning (L2023)	58.78	66.81	47.78	64.33	49.82	30.36	51.34	27.31	66.12	36.77	46.31	66.28	66.30	73.78

Signature of Head of Department: _____ Date: _____

Madhav Institute of Technology & Science Gwalior

Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ GRADE IN ENGINEERING Deemed University

Department : Computer Science & Engineering

Year 2023-2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
PO Attainment Direct	65.83	58.21	43.79	52.29	45.03	33.05	40.77	36.86	48.92	46.38	45.83	59.74	53.48	53.40
PO Attainment Indirect	70.68	74.25	76.16	75.34	75.34	76.99	74.52	78.08	76.16	75.07	75.34	77.78	77.81	79.18
PO Attainment	67.28	63.02	53.50	59.20	54.12	46.23	50.90	49.23	57.09	54.99	54.68	65.15	60.78	61.13



Madhav Institute of Technology & Science Gwalior

Deemed University

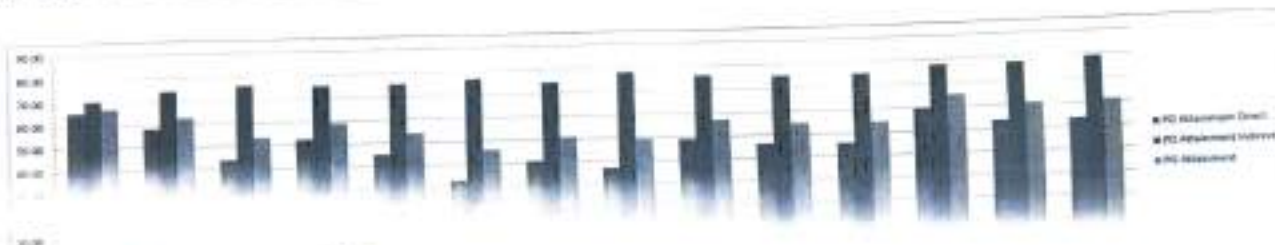
(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ GRADE IN ENGINEERING Deemed University

Department : Computer Science & Engineering

Year 2023-2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
PO Attainment Direct	65.83	58.21	43.79	52.29	45.09	33.05	40.77	36.86	48.92	46.38	45.83	39.74	53.48	53.40
PO Attainment Indirect	70.68	74.25	76.16	75.34	75.34	76.99	74.52	78.08	76.18	75.07	75.34	77.78	77.81	79.18
PO Attainment	67.28	63.02	53.50	59.20	54.12	46.23	50.90	49.23	57.09	54.99	54.68	65.15	60.78	61.13



Handwritten signatures and initials in blue ink at the bottom of the page.

Target (%):	60		
POs	PO Attainment (%)	Attained/Not Attained	Action taken for not attained
PO1	67.28	Attained	-
PO2	63.02	Attained	-
PO3	53.5	Not Attained	More interactive sessions are planned with professionals from industry in order to expose the industrial / societal problems. Skill Based Projects are introduced. In-house Summer internship program to enhance the skills of students was arranged.
PO4	59.2	Not Attained	Assignments and seminars are given and they are expected to study the real world problems and give presentation about their ideas to solve them. In-house internships in the form of Finishing schools and summer internships were conducted to help students to solve complex computer science and engineering problems.
PO5	54.12	Not Attained	Conduct hands-on workshops and hackathons focused on practical applications of engineering concepts. Organize expert guest lectures on emerging technologies and industry demands.
PO6	46.23	Not Attained	Encouraged to participate in the extra-curricular activities through NSS etc. To identify the problems in the society and the scope for solving through engineering.
PO7	50.9	Not Attained	Additional interactive session were arranged for students in courses like IPR and Disaster management.
PO8	49.23	Not Attained	EEES course was introduced to further strengthen the PO - Develop team-based projects to simulate industry environments - Encourage collaborative problem-solving.

Handwritten signatures and initials at the bottom of the page.

PO11	54.68	Not Attained	Students were allowed/encouraged to take industry internships for completing 8th semester projects
PO12	65.15	Attained	-
PSO1	60.78	Attained	-
PSO2	61.13	Attained	-

Handwritten signatures and initials in blue ink, including:

- A large stylized 'P' at the top left.
- A large stylized 'C' at the top center.
- A cluster of signatures on the left side, including a large 'R' and a signature that looks like 'Raj'.
- A signature 'Raj' in the center.
- A large stylized 'K' or 'A' at the bottom center.
- A signature 'X' at the bottom right.
- A large stylized 'D' or 'O' at the bottom right.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)

(Declared Under District Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade



Department of Computer Science and Engineering

Annexure-18

*curricula feedback from various stakeholders
(Computer Science and Engineering)*



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

Declared under Section 3 of the Ministry of Education, Government of India

Public, ACCREDITED WITH A++ Grade
Sole & Mandate, Greater N.P.J. - 574009, INDIA
Ph: 011-261240160, E-mail: vicerector@mitgwalior.in, Website: www.mitgwalior.in



MAHATMA

Feedback Analysis (July. - Dec 2024)

The content was clear and easy to understand	0	0	0	14.29	85.71	97.14
The course was relevant and updated for present needs	0	0	0	14.29	85.71	97.14
The course meets your career expectations	0	0	0	14.29	85.71	97.14
The course will be useful to meet your higher studies/future aspirations.	0	0	0	14.29	85.71	97.14

Course Name & Code: Data Science (2150511)

No. of Responses: 24

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	4.17	0	25	20.83	50	82.5
The syllabus units are balanced	4.17	4.17	29.17	20.83	41.67	78.34
The learning material was available to you	0	8.33	25	20.83	45.83	80.83
The content was clear and easy to understand	0	4.17	20.83	37.5	37.5	81.67
The course was relevant and updated for present needs	0	0	25	29.17	45.83	84.17
The course meets your career expectations	0	4.17	25	25	45.83	82.5
The course will be useful to meet your higher studies/future aspirations.	0	4.17	16.67	33.33	45.83	84.16

Handwritten signatures and initials at the bottom of the page.



Feedback Analysis (July. - Dec 2024)

Course Name & Code: Networking with TCP/IP (2150512))

No. of Responses: 19

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	5.26	5.26	36.84	10.53	42.11	75.79
The syllabus units are balanced	10.53	5.26	36.84	5.26	42.11	72.63
The learning material was available to you	10.53	0	36.84	5.26	47.37	75.79
The content was clear and easy to understand	5.26	5.26	36.84	5.26	47.37	76.84
The course was relevant and updated for present needs	5.26	0	36.84	10.53	47.37	78.95
The course meets your career expectations	5.26	0	36.84	10.53	47.37	78.95
The course will be useful to meet your higher studies/future aspirations.	5.26	0	26.32	21.05	47.37	81.05

Course Name & Code: Disaster Management(Mandatory Audit Course) (1000006))

No. of Responses: 16

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	6.25	31.25	12.5	50	81.25
The syllabus units are balanced	0	0	25	31.25	43.75	83.75



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

Deemed University

NAAC ACCREDITED WITH A++ Grade

Unit & Header, Semester III & IV - 4th Sem, 2024
Ph: 075-251-242320, E-mail: madhavinsti@nitagwalior.in, Website: www.mitsgwalior.in



MITS

Feedback Analysis (July. - Dec 2024)

The learning material was available to you	0	0	43.75	6.25	50	81.25
The content was clear and easy to understand	0	0	31.25	18.75	50	83.75
The course was relevant and updated for present needs	0	6.25	31.25	18.75	43.75	80
The course meets your career expectations	0	12.5	25	18.75	43.75	78.75
The course will be useful to meet your higher studies/future aspirations.	0	6.25	31.25	6.25	56.25	82.5

Course Name & Code: Python Programming (3150309)

No. of Responses: 71

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	2.82	15.49	35.62	45.07	84.79
The syllabus units are balanced	0	4.23	18.31	29.58	47.89	84.23
The learning material was available to you	1.41	1.41	14.08	32.39	50.7	85.91
The content was clear and easy to understand	1.41	0	19.72	29.58	49.3	85.08
The course was relevant and updated for present needs	0	2.82	19.72	29.58	47.89	84.51
The course meets your career expectations	1.41	2.82	19.72	29.58	46.48	83.39
The course will be useful to meet your higher studies/future aspirations.	1.41	1.41	16.9	36.62	43.66	83.94



Feedback Analysis (July. - Dec 2024)

Course Name & Code: Web Technologies OC-2 - 910223)

No. of Responses: 31

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	3.23	22.58	32.26	41.94	82.59
The syllabus units are balanced	0	3.23	16.13	29.03	51.61	85.8
The learning material was available to you	6.45	6.45	16.13	29.03	41.94	78.71
The content was clear and easy to understand	0	6.45	16.13	41.94	35.48	81.29
The course was relevant and updated for present needs	0	6.45	12.9	41.94	38.71	82.58
The course meets your career expectations	0	3.23	19.35	38.71	38.71	82.58
The course will be useful to meet your higher studies/future aspirations.	0	3.23	19.35	41.94	35.48	81.93

Course Name & Code: Cloud Computing and Virtualization(2150519)

No. of Responses: 51

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	3.92	31.37	21.57	43.14	80.79
The syllabus units are balanced	0	6.88	27.45	23.53	43.14	80.79

[Handwritten signatures and marks]



Feedback Analysis (July - Dec 2024)

The learning material was available to you	1.96	5.88	21.57	29.41	41.18	80.39
The content was clear and easy to understand	1.96	7.84	23.53	27.45	39.22	78.83
The course was relevant and updated for present needs	0	7.84	29.41	25.49	37.25	78.42
The course meets your career expectations	0	5.88	27.45	23.53	43.14	80.79
The course will be useful to meet your higher studies/future aspirations.	1.96	1.96	23.53	31.37	41.18	81.57

Course Name & Code: Information Security (2150513)

No. of Responses: 46

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	2.17	6.52	34.78	21.74	34.78	76.08
The syllabus units are balanced	4.35	2.17	32.16	23.91	36.96	77.12
The learning material was available to you	2.17	4.35	34.78	17.39	41.3	78.25
The content was clear and easy to understand	4.35	4.35	32.61	21.74	36.96	76.53
The course was relevant and updated for present needs	2.17	4.35	32.61	23.91	36.96	77.83
The course meets your career expectations	2.17	2.17	34.78	21.74	39.13	78.69

[Handwritten signatures and marks]



Feedback Analysis (July - Dec 2024)

The course will be useful to meet your higher studies/future aspirations.	2.17	4.35	32.51	26.09	34.78	77.39
---	------	------	-------	-------	-------	-------

Course Name & Code: Universal Human Values and Professional Ethics (Mandatory Audit Course) (1000008)

No. of Responses: 15

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	0	12.5	25	62.5	90
The syllabus units are balanced	0	0	12.5	18.75	68.75	91.25
The learning material was available to you	0	0	12.5	18.75	68.75	91.25
The content was clear and easy to understand	0	0	12.5	18.75	68.75	91.25
The course was relevant and updated for present needs	0	0	18.75	12.5	68.75	90
The course meets your career expectations	0	0	12.5	18.75	68.75	91.25
The course will be useful to meet your higher studies/future aspirations.	0	0	12.5	18.75	68.75	91.25

Course Name & Code: Distributed Systems DE-2 - 150713)

No. of Responses: 29

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	0	13.79	17.24	68.97	91.04



Feedback Analysis (July - Dec 2024)

The syllabus units are balanced	0	0	13.79	20.69	65.52	90.35
The learning material was available to you	0	3.45	13.79	27.59	55.17	86.9
The content was clear and easy to understand	0	6.9	6.9	31.03	55.17	86.89
The course was relevant and updated for present needs	0	3.45	17.24	27.59	51.72	85.52
The course meets your career expectations	3.45	0	13.79	31.03	51.72	85.51
The course will be useful to meet your higher studies/future aspirations	0	0	17.24	24.14	58.62	88.28

Course Name & Code: Compiler Design (2150514)

No. of Responses: 35

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	2.86	0	37.54	34.29	25.71	76.24
The syllabus units are balanced	0	5.7	37.14	34.29	22.86	74.86
The learning material was available to you	2.86	11.43	25.72	34.29	25.71	73.72
The content was clear and easy to understand	0	11.43	40	28.57	20	71.43
The course was relevant and updated for present needs	0	8.57	37.14	31.43	22.86	73.72
The course meets your career expectations	0	11.43	37.14	25.71	25.71	73.13



Feedback Analysis (July. - Dec 2024)

The course will be useful to meet your higher studies/future aspirations.	0	8.5	31.43	34.29	25.71	75.4
---	---	-----	-------	-------	-------	------

Course Name & Code: Design and Analysis of Algorithms(3150303)
No. of Responses:75

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	5.33	13.33	37.33	44.00	83.99
The syllabus units are balanced	0	4	8.67	36	41.33	76.93
The learning material was available to you	0	2.67	17.33	33.33	46.67	84.8
The content was clear and easy to understand	1.33	2.67	14.67	37.33	44	84
The course was relevant and updated for present needs	1.33	4	18.67	33.33	42.67	82.4
The course meets your career expectations	2.67	1.33	21.33	32	42.67	82.13
The course will be useful to meet your higher studies/future aspirations.	1.33	2.67	13.33	37.33	45.33	84.53

Course Name & Code: Digital Image Processing DE-2 - 290711)
No. of Responses:9

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	0	22.22	33.33	44.44	84.44



Feedback Analysis (July. - Dec 2024)

The syllabus units are balanced	0	0	33.33	22.22	44.44	82.21
The learning material was available to you	0	11.11	22.22	22.22	44.44	79.99
The content was clear and easy to understand	0	11.11	22.22	22.22	44.44	79.99
The course was relevant and updated for present needs	0	0	33.33	11.11	55.56	84.45
The course meets your career expectations	0	0	33.33	22.22	44.44	82.21
The course will be useful to meet your higher studies/future aspirations.	0	0	22.22	22.22	55.56	86.67

Course Name & Code: Data Base Management Systems(3150304)

No. of Responses: 84

Parameters	Below Average (%age Response)	Average (%age Response)	Good (%age Response)	Very Good (%age Response)	Excellent (%age Response)	Overall Score (%)
The course is well designed	0	2.38	25	28.57	44.05	82.86
The syllabus units are balanced	0	0	21.43	29.76	48.81	85.48
The learning material was available to you	0	0	17.86	36.9	45.24	85.48
The content was clear and easy to understand	0	0	20.24	36.95	42.81	85.71
The course was relevant and updated for present needs	0	0	19.05	34.52	46.43	85.48
The course meets your career expectations	0	0	23.81	28.57	47.62	84.76



Feedback Analysis (July. - Dec 2024)

The course will be useful to meet your higher studies/future aspirations.	0	2.38	20.24	30.05	46.43	84.29
---	---	------	-------	-------	-------	-------

Additional Suggestion by students and Action Taken Report

S. No.	Course name and code	Additional Comments by students						Action Taken
		Details of the course / contents which in the student's opinion are outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?	Suggestion for Honours:	Suggestion for Minor specialization:	Suggestion for Departmental electives:	
1	Operating Systems (3150302)	remove disk scheduling I think in OS is the only subject where each and every topic is imp for us. So i will nothing is outdated No memory management techniques	memory management practical experience of os related algorithms and techniques implementation of much one on one communication on learning Disk Scheduling	Operating system Lab should be added in this course. na	No	No	No	the upcoming BOS meeting for the updates suggested by the students. The suggestive list of Honor, Minor and elective courses will be forwarded and presented in upcoming BOS for necessary actions.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

Deemed to be University

(Declared under Section 3 of the U.P. Act, 1947, Government of India)

N.A.C. ACCREDITED WITH A++ Grade

Sole Ka Mandir, Gwalior (M.P.) - 474005, INDIA

Ph: 0562-2612402/2403, E-mail: vishwakarma@mitgwalior.in, Website: www.mitgwalior.in



MITG

Feedback Analysis (July. - Dec 2024)

		which are not used in real life	na						
		Memory management	No						
		File system interface	no						
		course was very well designed and i didnt feel to implement something new.	-						
		Disk Scheduling	-						
		na	na						
2	Adhoc Networks DE-2 - 150711)	na	na	na	na	na	na	na	All the responses are Satisfactory.
3	Data Science (2150511))	Excellence	Good	Good	GOOD	Good	Good	Good	All the responses are Satisfactory.
4	Disaster Management(Mandatory Audit Course) (1000006))	No	No	No	No	No	No	No	All the responses are Satisfactory.



Feedback Analysis (July - Dec 2024)

	OC-2 - 910223)								
8	Networking with TCP/IP (2150512)	GOOD	GOOD	GOOD	GOOD	NA	GOOD	all subject are updated no need for removing or adding	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.
9	Cloud Computing and Virtualization (2150519)	none TATA McGraw- Hill NA Good Nothing NA	Good none NB fundamental ideas behind Cloud Computing. NA	none Big data NA No	none Good NA	none More	More none	none Good	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.
10	Information Security (2150513)	Require much simplified explanation of topic	security measures	GENERATIVE AI	Dsa with java	Dsa with java	Dsa with java	Dsa with java	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students. The suggestive list of Honor, Minor and elective courses will be forwarded and presented in upcoming BOS for necessary actions.
11	Universal Human Values and Professional Ethics	Na	Na	Na	Na	Na	Na	Na	All the responses are Satisfactory.



Feedback Analysis (July. - Dec 2024)

	(Mandatory Audit Course) (1000008))								
12	Distributed Systems DE-2 - 150713)	Case studies	nothing	No	No	no	no	Introduction to Modern Application Development, IIT Madras	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.
13	Compiler Design (2150514))	code generation Excellence	nil	nil	ETHICAL HACKING	nil	nil	nil	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.
14	Digital Image Processing DE-2 - 290711)	no	no	no	no	no	no	no	All the responses are Satisfactory
15	Data Base Management Systems(315 0304)	File System Note	SQL	No	No	No	No	DBMS	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.

Handwritten signatures and initials in blue ink at the bottom of the page.



Feedback Analysis (July. - Dec 2024)

Student CO Feedback - CSE July-Dec 2024

Course Name & Code: Operating Systems (3150302)

No. of Responses: 78

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to CO1. Outline the basic concept of operating systems	60.26	37.18	2.56	85.9
(CO 2) I am able to CO2. Analyze the working of operating system	60.26	35.9	3.85	85.48
(CO 3) I am able to CO3. Examine the working of various scheduling/allocation approaches	66.67	29.49	3.85	87.61
(CO 4) I am able to CO4. Measure the performance of various scheduling/allocation approaches	81.54	34.62	3.85	85.9
(CO 5) I am able to CO5. Develop the Solution of various operating system problems/issues	53.85	41.03	5.13	82.91

Course Name & Code: Adhoc Networks DE-2 - 150711)

No. of Responses: 14

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Outlines the basics of wireless networks	78.57	21.43	0	92.86

[Handwritten signatures and marks at the bottom of the page]



Feedback Analysis (July. - Dec 2024)

I am able to identify various issues/problems associated with Ad-hoc networks and their Solutions	71.43	28.57	0	90.48
I am able to Examine the working of various Ad-hoc network protocols	71.43	28.57	0	90.48
I am able to Analyse the performance of various Ad-hoc network protocols	71.43	28.57	0	90.48
I am able to Develop the solutions of various problems/issues associated with ad-hoc Networks	71.43	28.57	0	90.48

Course Name & Code: Information Security (2150513)

No. of Responses: 96

Parameters(COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to explain attacks, hash algorithms and authentication mechanisms	41.67	51.04	7.29	78.13
I am able to illustrate fundamentals of number theory and security principles.	40.63	52.08	7.29	77.78
I am able to Apply various algorithms to achieve principles of network security	43.75	44.79	11.46	77.43
I am able to analyze the cause for various existing network attacks and describe the working of available security controls.	40.63	50	9.38	77.09
I am able to examine the vulnerabilities in IT infrastructure.	42.71	46.88	10.42	77.44
I am able to predict the attacks and controls associated with IP, transport-level, web and e-mail security.	41.67	50	8.33	77.78

Handwritten signatures and marks at the bottom of the page.



Feedback Analysis (July - Dec 2024)

Course Name & Code: Python Programming (3150309)

No. of Responses: 75

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
Recognize Python basic functions, operators, and Syntax	57.53	40	2.7	85.1
Implement Python built-in functions and control statements.	54.67	42.67	2.67	84.01
Implement Python user-defined functions and classes.	56	37.33	5.33	82.66
Summarize file and exception handling in Python.	56	41.33	2.67	84.44
Create Python GUI	46.57	44	9.33	79.01

Course Name & Code: Data Science (2150511)

No. of Responses: 23

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Define basic concepts of Data Sciences and Python.	60.87	34.78	4.35	85.51
I am able to identify various methods for the representation and manipulation of vectors.	52.17	43.48	4.35	82.61
I am able to Analysis of the data for applying various statistical modeling approaches.	39.13	52.17	8.7	76.81
I am able to Develop the skill to use statistical measures to identify significant features, evaluate model performance and perform regression analysis.	56.52	34.78	8.7	82.61



Feedback Analysis (July. - Dec 2024)

I am able to Develop expertise in managing missing data and assessing the impact of visualizations on data insight communication.	47.83	43.48	8.7	79.72
---	-------	-------	-----	-------

Course Name & Code: Disaster Management (Mandatory Audit Course) (1000006)

No. of Responses: 22

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Identify disaster prevention and mitigation approaches	54.55	40.91	4.55	83.34
I am able to Classify global and national disasters, their trends and profiles	54.55	40.91	4.55	83.34
I am able to Determine the impacts of various disaster	59.09	40.91	0	86.36
I am able to Apply Disaster Risk Reduction in management	54.55	45.45	0	84.85
I am able to Infer the linkage between disasters	59.09	40.91	0	86.36

Course Name & Code: Web Technologies OC-2 - 910223)

No. of Responses: 32

Parameters(COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
Identify software design process models and its applications	56.25	34.38	9.38	82.3
I am able to Construct webpages using HTML and CSS	59.38	40.63	0	86.47
I am able to Model website using JavaScript and PHP	53.13	40.63	6.25	82.3



Feedback Analysis (July. - Dec 2024)

I am able to Design Static and Dynamic website	56.25	37.5	6.25	83.33
I am able to Explain the working of web pages and data retrieval	59.38	31.25	9.38	83.34

Course Name & Code: Networking with TCP/IP (2150512)

No. of Responses: 31

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to identify various network layer protocol	48.39	45.16	6.45	80.65
I am able to identify various network layer protocol	51.61	35.48	12.9	79.56
I am able to analyze the working of Transport layer protocols	41.9	48.38	9.67	77.38
I am able to explain the working of Application layer protocols	51.61	41.93	6.45	81.71
I am able to simulate network protocols & Topologies	48.38	41.93	9.6	79.53

Course Name & Code: Universal Human Values and Professional Ethics (Mandatory Audit Course) (1000008)

No. of Responses: 13

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to become more aware of their surroundings, society, social problems and their sustainable solutions.	53.85	46.15	0	84.62
I am able to become sensitive to their commitment towards what they believe in (humane values, humane relationships and humane society).	53.85	46.15	0	84.62



Feedback Analysis (July - Dec 2024)

I am able to apply what they have learnt to their own self in different day-to-day settings in real life.	69.23	30.77	0	89.74
I am able to sustain human relationships and human nature in mind.	61.54	38.46	0	87.18
I am able to have better critical ability.	69.23	30.77	0	89.74

Course Name & Code : Distributed Systems DE-2 - 150713)

No. of Responses: 31

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to tell the basic elements and concepts related to distributed system Technologies.	66.67	26.67	6.67	86.67
I am able to demonstrate knowledge of the core architectural aspects of distributed systems.	56.67	36.67	6.67	83.34
I am able to identify how the resources in a distributed system are managed by algorithm.	63.33	23.33	13.33	83.33
I am able to examine the concept of distributed file system and distributed shared memory.	66.67	26.67	6.67	86.67
I am able to compare various distributed system algorithms for solving real world problems.	63.33	23.33	13.33	83.33
I am able to develop application for achieving various services of distributed system.	66.67	20	13.33	84.45

Handwritten signatures and marks at the bottom of the page.



Feedback Analysis (July. - Dec 2024)

Course Name & Code: Cloud Computing and Virtualization(2150519)

No. of Responses: 55

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
Build the fundamental ideas behind Cloud Computing, the evolution of the paradigm, and introduce the virtualization concepts	43.64	5.45	3	48.27
Understand ideas and principles of Virtualization and its applications.	41.82	52.73	5.45	78.79
Describe fundamental concepts of cloud infrastructures and Service Oriented Architecture.	45.45	41.82	12.73	77.57
Illustrate the fundamental concepts of cloud storage and cloud security	50.91	40	9.09	80.61
Study of various tools and technologies for implementing applications of Cloud.	47.27	43.64	8.09	79.39

Course Name & Code: Compiler Design (2150514)

No. of Responses: 45

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Compare the similarities and differences among various parsing techniques and grammar transformation techniques.	42.22	53.33	4.44	79.25
apply the knowledge of lex & yacc tool to develop a scanner & parser	42.22	53.33	4.44	79.25
examine various parsing techniques and their comparison	37.78	55.56	6.67	77.04
Implement various code generation and code optimization techniques.	35.56	55.56	8.89	75.56



Feedback Analysis (July. - Dec 2024)

Analyze different tools and techniques for designing a modern compiler.	40	46.67	13.33	75.56
---	----	-------	-------	-------

Course Name & Code: Design and Analysis of Algorithms (3150303)

No. of Responses: 68

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Tell the basic features of an Algorithms.	54.41	41.8	4.41	83.75
I am able to Outline major Algorithms and Data Structures.	57.35	38.34	4.41	84.38
I am able to Apply various algorithmic design paradigms.	52.94	44.12	2.94	83.33
I am able to Compare different design techniques to develop algorithms for computational problems.	48.53	50	1.47	82.35
I am able to Design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach.	52.94	45.59	1.47	83.82

Course Name & Code: Digital Image Processing DE-2 - 290711)

No. of Responses: 8

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Explain different modalities and current techniques in image acquisition.	50	50	0	83.75



Feedback Analysis (July. - Dec 2024)

I am able to Classify spatial and frequency domain techniques used in image processing.	50	50	0	84.38
I am able to apply image processing techniques to enhance visual images	62.5	37.5	0	83.33
I am able to analyze the constraints in image processing when dealing with real problems	62.5	37.5	0	82.35
I am able to evaluate various enhancement, restoration and retrieval techniques of image processing	37.5	62.5	0	83.82

Course Name & Code: Data Base Management System(3150304)

No. of Responses: 85

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Explain the terminology, features, classifications, characteristics, and data models embodied in database systems.	62.35	36.47	1.18	87.06
I am able to Describe the concepts related to the data modeling techniques, relational database model and relational algebra.	60	37.65	2.35	85.88
I am able to Apply the SQL commands over a given relational schema.	64.71	34.12	1.18	87.85
I am able to Analyze database schema to apply normalization technique for schema refinement.	60	36.47	3.53	85.49
I am able to Apply the transaction processing concepts and recovery methods over a real-time database system.	55.29	40	4.71	83.53



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University
Declared under Section 3 of the University Act, 1956, Government of India
NAAC ACCREDITED WITH A++ Grade
Gita Ka Mandir, Gwalior (M.P.) - 471005, INDIA
Ph: +91-761-240110, E-mail: admission@mitgwalior.ac.in, exam@mitgwalior.ac.in



BMYS

Feedback Analysis (July. - Dec 2024)



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade

Gola Ka Mandir, Gwalior (M.P.) - 474005, INDIA

Ph: +91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



Department of Computer Science and Engineering

Analysis Report on Employer Feedback

S. No.	Employer Name	Company/Organization Name	Feedback/Suggestions for Students	Feedback/Suggestions for the Institute
1.	Prashant Singh Hada hadaprashant2002@g mail.com	Persistent Digital Commerce Private Limited	He's a quick learner.	No comments, everything's fine
2.	Rohit Ahirwar rohitsindia@gmail.com	Engineering Innovations Research Lab Pvt Ltd	Good in team management	Train in Flutter development, Machine Learning
3.	Sneha S - HR careers@cosgrid.com	Cosgrid Systems Pvt Ltd	The student is skilled at building backend systems and integrating machine learning algorithms effectively	None
4.	Arvind Srivastava arvind.srivastava@zyvi ka.com	Zyvik	The student is technically strong, has good communication skills, and is a team player. He will be an asset to an organization.	
5.	Bhargav Reddy Dwarampudi d.bhargavreddy000143 @gmail.com	Amazon	Java was a missing skill and our team uses Java widely but she was able to learn quickly and deliver in less time she is good at deep diving and helped other co-interns with her deep	Java is a must and widely used across Amazon. Add the courses related to the technologies used at Amazon (i.e., Java, AWS) quickly.

[Handwritten signatures and marks at the bottom of the page]



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under District Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade

Gola Ka Mandir, Gwalior (M.P.)- 474005, INDIA

Ph.:+91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



MITS Gwalior

			dive and finding new tools that are useful to our team which are used across Amazon.	
6.	Ankit Singh ankit.s@deltax.com	DeltaX	None	None
7.	Ajay Rathore ajayrathore.cosmitech@gmail.com	Cosmitech Infosystem Private Limited	the student is excellent and shows great potential	I suggest offering trending MOOC courses like the course in AI and mobile development
8.	Jayant Anand Choudhary jayantanand.choudhary@gmail.com	JC Solutions	None	None
9.	Rishabh Jain rishabh.jain@codingclub.tech	Coding Club India	Overall performance is satisfactory.	MITS, Gwalior, demonstrates a strong commitment to quality education, providing students with a solid foundation in both theoretical knowledge and practical skills. The institute's focus on industry-relevant training prepares graduates effectively for professional success.
10.	Awesh Divya Pandit awesh.d@optivaluetek.com	OPTIVALUETEK CONSULTING PVT LTD		SDLC, ML, AI, DevOps, Python, React.

Handwritten signatures and initials in blue ink at the bottom of the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade

Gola Ka Mandir, Gwalior (M.P.) - 474005, INDIA

Ph.: +91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



MIT'S

11.	Nilesh Jarad nilesh.jarad701@gmail.com	Leadership Boulevard Pvt. Ltd	Outstanding performance throughout	None
12.	Krati Vyas (Team Lead) krati@innovqant.com	Innovqant Solution Pvt. Ltd		
13.	Vijay Rathore hrteambonasys@gmail.com	Bonasys IT Solutions Private Limited	Student have a good knowledge of their domain	Focus on AI, development, DevOps, and cloud technologies, not just on machine learning
14.	Vishal Jain vishal.j@numericinfoystem.com	Numeric Infosystem Private Limited	Excellent performance	All good
15.	Shivam Singhal shivam-singhal@newgensoft.com	Newgen Software Pvt.Ltd	He demonstrates strong skills in Java and consistently shows sincerity and discipline in his work. He participates actively in class and submits high-quality assignments on time. Overall, he is a dedicated and hardworking student	Yes, train in technologies like Java, Spring, React, etc.
16.	Anurag Khard anurag.connect@gmail.com	Kloudspot		

Handwritten signatures and initials in blue ink at the bottom of the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under District Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade

Gola Ka Mandir, Gwalior (M.P.) - 474005, INDIA

Ph: +91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



MITS

17.	Ashutosh Rajoriya ashutosh@floobyte.com	Floobyte It Solutions	The student's knowledge of industry trends is impressive. MITS Gwalior seems to be providing a solid foundation for its students	It's great to see that MITS Gwalior is equipping its students with the knowledge and skills to stay current on industry trends.
18.	Elavarasi kumar elavarasi@nullclass.com	Nullclass EdTech Private Limited	The candidate is Polite and a quick learner.	You're rendering each individual capable of working by self.
19.	Ram Mohan Sharma ram.sharma@thehiringcompany.co.in	The Hiring Company	He is very honest towards his work and apart from it he was managing the decorum of my premise	As per the market standard MITS is delivering good content for students
20.	Anurag Singh Kushiwah anurag@techrefic.com	Techrefic Technologies Private Limited	Talented, Hard-Working and Disciplined	Courses focusing on Blockchain can benefit students and employer more in upcoming future. MIT Gwalior is setting up their standard high, by pro-actively taking feedbacks from industrial experts, which i think will set MIT ahead from other institutes
21.	Anupma Singh hrtteam.interviewcracker@gmail.com	Interview Cracker	Student possess good knowledge of the recent technologies, and is collaborative, attentive. She is well-versed to work effectively on any tech stack ahead.	As a suggestion, you can focus more on developing knowledge in the recent technologies such as Blockchain, AI, Cloud Computing, DevOps, Generative AI so that individuals will become industry ready.

Handwritten signatures and initials at the bottom of the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade

Gola Ka Mandir, Gwalior (M.P.) - 474005, INDIA

Ph.: +91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



22.	Shalini Singh shalini-singh@newgensoft.com	Newgen Software's Limited	The intern is performing cordially in his tasks.	The institute initiative to prepare the students for the placements as a whole is adequate.
23.	Vishal Verma vishalverma@indvibelinfotech.in	INDVIBE INFOTECH PRIVATE LIMITED	None	None
24.	Reecha Sanjiv Topinkatti reechat@tejasnetworks.com	Tejas Networks Private Limited	None	None
25.	Nitin Tripathi(HR Manager) hr.cosmic101@gmail.com	Cosmictech Infosystems Private Limited	Very Good	MITS Gwalior fosters a dynamic learning environment where innovation thrives , preparing students for impactful careers in engineering
26.	Rajesh Soni rajeshsoni.daphnysis@gmail.com	DAPHNISYS TECHNOLOGIES PVT. LTD.	Eager learner who thrived in both independent and team projects. The course designed is apt and up to date with the industry trends.	The CS program offered at MITS seems adequate and promising of making students ready for the latest tech trends.
27.	Piyush Shivhare sales.team@volmo.in	Volmo Electrical Pvt Ltd	All Good	All Good

Handwritten signatures and initials at the bottom of the page.



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University

(Declared under District Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ Grade

Gola Ka Mandir, Gwalior (M.P.)- 474005, INDIA

Ph.: +91-751-2409300, E-mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in



MITS

28.	Vinay Kumar vinay.kumar4530@yahoo.com	RxLogix Corp.	None	None
-----	---	---------------	------	------

Handwritten signatures and initials in blue ink, including a large signature at the top left and several smaller ones below it.

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE

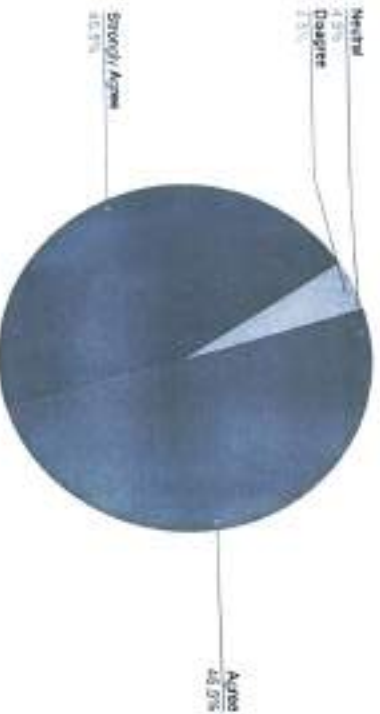
(Deemed to be University)

Department of CSE

ALUMNI FEEDBACK ANALYSIS (July-Dec 2024)

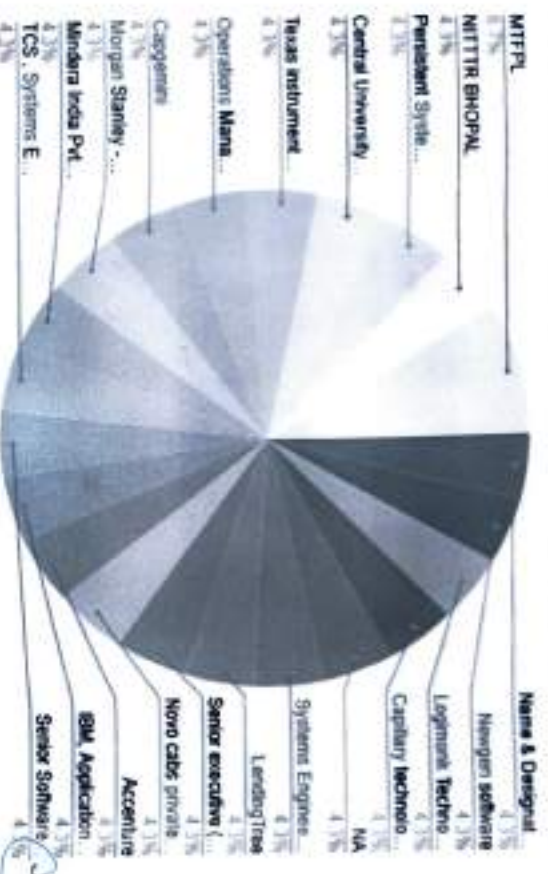
TOTAL RESPONSES: 22

Count of Do you find yourself capable of making a good career ?

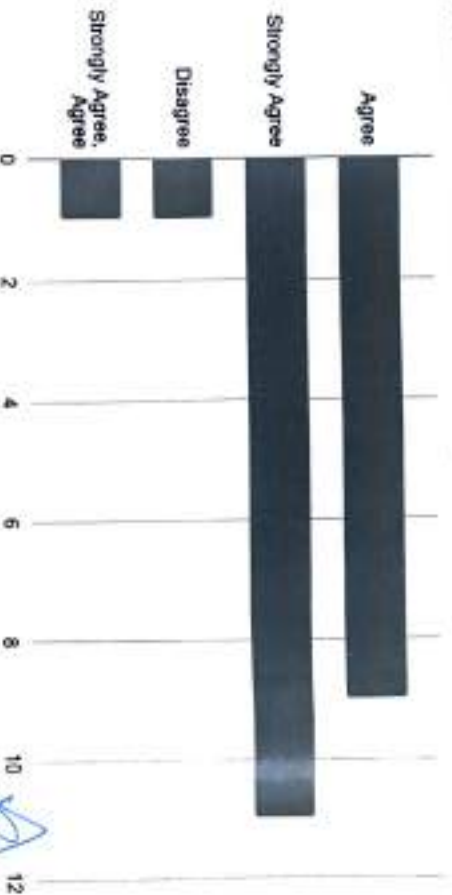


Handwritten signatures and initials in blue ink, including a large 'X' and several other marks.

Name & Designation : MNC/Company Joined



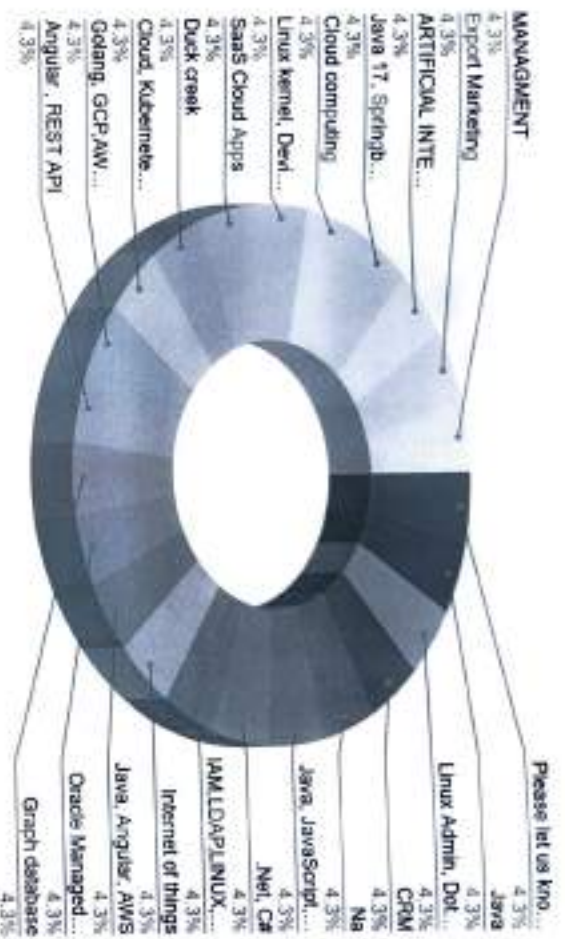
Count of Do you feel that you are able to manage projects in an ethical manner and work efficiently as a member /leader of m...



Count of Do you feel that you are able to manage projects in an ethical manner a...

Handwritten signatures and initials in blue ink.

Please let us know current technologies used in Industries or Technologies in which you are working



Handwritten signatures and initials in blue ink, including a large 'C' and several stylized marks.



1	h				
2	h				
3	h				
4	h				
5	h				
6	h				
7	h				
8	h				
9	h				
10	h				
11	h				
12	h				
13	h				
14	h				
15	h				
16	h				
17	h				
18	h				
19	h				
20	h				
21	h				
22	h				
23	h				
24	h				
25	h				
26	h				
27	h				
28	h				
29	h				
30	h				
31	h				
32	h				
33	h				
34	h				
35	h				
36	h				
37	h				
38	h				
39	h				
40	h				
41	h				
42	h				
43	h				
44	h				
45	h				
46	h				
47	h				
48	h				
49	h				
50	h				
51	h				
52	h				
53	h				
54	h				
55	h				
56	h				
57	h				
58	h				
59	h				
60	h				
61	h				
62	h				
63	h				
64	h				
65	h				
66	h				
67	h				
68	h				
69	h				
70	h				
71	h				
72	h				
73	h				
74	h				
75	h				
76	h				
77	h				
78	h				
79	h				
80	h				
81	h				
82	h				
83	h				
84	h				
85	h				
86	h				
87	h				
88	h				
89	h				
90	h				
91	h				
92	h				
93	h				
94	h				
95	h				
96	h				
97	h				
98	h				
99	h				
100	h				

Dr. Kaundep Kaur
Department Alumni Coordinator

Handwritten signatures and initials in blue ink, including a large signature on the left and several initials on the right.