

New BOS member names for December 2022 Bos

Date: 11/20/2023 12:02 PM

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

IAUVE Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal

Reg. No. DA-511/2023

Date: /2022

NOTICE

Subject: Nomination of members of Board of Studies as per UGC norms

The Board of Studies (BOS) of the Computer Science and Engineering is to be constituted according to the UGC order no. 10/2015 for a period of Three Years as follows.

BOS COMPUTER SCIENCE AND ENGINEERING

S. No.	Name of expert	Designation/Affiliation	Mobile No
1	Head of the Department	Dr. Manish Dixit Professor	9425117866
2	Member		66081
3	Member		ciwet13@gmail.com
4	Member		965336
5	Member	Professor, IITM Gwalior	sverma@iitm.ac.in
6	Member		9406967661
7	Member		avarya@iitm.ac.in
8	Member from industry/corporate sector/allied area		
9	Rubina Mahotra	Co-Founder & Executive Director, Kailash Jee & Research Centre Pvt Ltd. Indore.	9301391291 rubysmahotra@gmail.com
10	Ravi Prakash Mahotra	Assistant Vice President Citi Bank Since 2012	+6582389102 Ravi.prakash@gmail.com

DEC - 2023



MANISH DIXIT <dixitmits@mitsgwalior.in>

New BoS member names for December 2022 Bos

2 messages

Dean Academics <deanacademics@mitsgwalior.in>
To: "Dr. Manish Dixit" <dixitmits@mitsgwalior.in>

Sat, 11 Dec 2022 12:42 AM

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

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

Ref. No. DA/MP/2022

Date: 2022

NOTICE

Subject: Nomination of members of Board of Studies as per UGC norms

The Board of Studies (BoS) of the Computer Science and Engineering is to be constituted according to the UGC Guidelines January, 2018 for a period of Three Years as follows.

BoS COMPUTER SCIENCE AND ENGINEERING

S.No	Name of Expert	Designation/Affiliation	Mobile No
1	Head of the Department	Dr. Manish Dixit Professor	9425117866
2	All Regular faculty of the Department		
One expert nominated by the Vice chancellor, RGPV			
1	Dr. Anil Kumar Solanki	Professor Department of Computer Science and Engineering, BIET, Jhansi - 284 128 (U.P.)	9415060081 E-mail: solankibiet13@gmail.com
Two subjects experts from Outside RGPV nominated by Academic Council			
1.	Dr. Shekhar Verma	Professor HIT, Allahbad	9450965336 sverma@hita.ac.in
2.	Dr. K.V Arya	Professor, HITM Gwalior	9406967661 kvarya@hitm.ac.in
One representative from industry/corporate sector/allied area			
	Ms Ruby Malhotra	Co-Founder & Executive Director, Knittech Test & Research Centre Pvt Ltd - Indore,	9301391291 rubysmalhotra@gmail.com
One alumnus			
1	Ravikant Sharma	Assistant Vice President Citi Bank Singapore	+6582389192 Ravi.archie@gmail.com

Dean Academics
Office

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Agenda of the BoS Meeting

(BoS Meeting Scheduled on 2nd Dec 2023)

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 given 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
Computer System Organization	3150223	Dec-2022	Dec 2023	10	15		

Courses focusing on employability/entrepreneurship/ skill development

(Course/subject name)	Course Code	Activities/contents which have a bearing on increasing skill and employability	Agenda Item No.	Page No.	Link of relevant documents/minutes
Foundations of Cyber Physical Systems		This course will cover Hybrid Automata based modeling of CPS Reachability analysis Lyapunov Stability, Barrier Functions Quadratic Program based safe Controller Design	4	1	
Selected Topics in Algorithms	150863	Course give knowledge about Markov Chain, Random Walks, Designing Approximation Algorithms using Linear Programs: Rounding, Primal-Dual Schema Parameterized Algorithms: Fixed Parameter Tractable Algorithms, Kernelization, Bounded Search Iterative Compression, Color Coding	4	1	
Affective Computing		This course focuses on enabling the machines with emotion recognition and adaptive interaction. It lies in the intersection of Computer Science, design and human psychology.	4	1	
User-centric Computing For Human-Computer Interaction		This course will cover Engineering user-centric systems relation with software engineering, iterative life-cycle, prototyping, guidelines, Computational user models (classical) – GOMS, KLM, Fitts' law, Hick-Hyman's law	3	3	

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Digital Design with Verilog		Multi-level Logic Optimization Heuristic Based Logic ESPRESSO Heuristic-based Logic Optimization Prime Implicate and Essential Prime implicates, Multi-level Logic Minimization using Prime Implication Chart, Introduction to Verilog Combinational Logic Implementation of FSM using Verilog, Algorithmic State Machine and RTL	8	3	
Getting Started with Competitive Programming		This is a course on algorithm design with a focus on issues of modeling and implementation and also cover Greedy Algorithms, Disjoint Set Union with Path Compression, Network Flows, Divide and Conquer, Dynamic programming	8	3	
Cloud Computing & Virtualization	150611	cloud computing is the delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet	6		
Machine Learning	150613	The Course will cover the different learning paradigms and some of the more popular algorithms and architectures used in each of these paradigms.	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
optimization Techniques	2150412	The analysis stage of the engineering design process is when mathematical models and scientific principles are employed. The optimization stage of the engineering design process is help in optimal solution.	12		
Foundations of Cyber Physical Systems		This course will cover Hybrid Automata based modeling of CPS, Reachability analysis, Lyapunov Stability, Barrier Functions, Quadratic Program based safe Controller Design	4		
Selected Topics in Algorithms		Course give knowledge about Markov Chain, Random Walks,	4		

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		Designing Approximation Algorithms using Linear Programs: Rounding, Primal-Dual Schema Parameterized Algorithms: Fixed Parameter Tractable Algorithms, Kernelization, Bounded Search Iterative Compression, Color Coding			
Affective Computing		This course focuses on enabling the machines with emotion recognition and adaptive interaction. It lies in the intersection of Computer Science, design and human psychology.	4		

Feedback on curriculum received from stakeholders: Analysis & ATR*

Stakeholder	Student	Faculty	Alumni	Employer
No. of responses	375	18	35	
Link of Analysis	Annexuer	Annexuer	Annexuer	Annexuer
ATR Link	Annexuer	Annexuer	Annexuer	Annexuer
Link showing Excel sheet of Google Form details of stakeholders	Annexuer	Annexuer	Annexuer	Annexuer

* 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 <u>link for the same must be shared with the office of the Dean Academics.</u>
3.	The following must be uploaded on the departmental web page and <u>link for the same must be shared with the office of the Dean Academics.</u> • The Stakeholder feedback collected & analyzed to find the index out of five • Action Taken Report on each feedback • Google form showing responses from alumni, employer, student, faculty etc.
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 Dean Academics office.

BoS Agenda Items

Item 1	To confirm the minutes of the previous BoS meeting held in the month of May-June 2023. <i>Minutes of the last BoS held on 2nd June 2023 are confirmed by the house.</i>
Item 2	The examination committees constituted vide Dean Academics Notice no 1332 dated 20/4/2021 need to be reconstituted this year. <i>Reconstituted</i>
Item 3	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 2020-21. (The total credits from I-VIII semester should not be less than 160 for this batch).

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The scheme for B.Tech VIII Semester, CSE discipline (under flexible curriculum) were discussed and finalized.

The same is enclosed in Annexure I

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 2020-21).

The list of Departmental Elective (DE-5 & OC-3) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VIII Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail.

*DE-5 (SWAYAM/NPTEL/ MOOC platform)		*Open Category (OC-3) (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)	
1	GPU Architecture and Programming (noc24-cs30)-12 week	1	Data Analytics with Python (noc24-cs20)-12 WEEK
2	Foundations of Cyber Physical Systems (noc24-cs27)-12 week	2	Advanced Computer Networks (noc24-cs11)-12 WEEK
3	Selected Topics in Algorithms (noc24-cs46)-12 week	3	Affective Computing (noc24-cs12)-12 week
4	Introduction to Soft Computing (noc24-cs37)-12 week	4	Linear Programming and its applications to computer Science

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. VIII semester students (for the batch admitted in 2020-21)] and for B.Tech. VI semester (CSE) (for the batch admitted in 2021-22)]

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

1) Honours (for students of the host department)

2) Minor Specialization (for students of other departments)

[These will be offered through SWAYAM/NPTEL/MOOC based Platforms for the VI semester (CSE) (for the batch admitted in 2021-22) and for VIII semester students (for the batch admitted in 2020-21)]

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" VI Semester(CSE)

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***honours (SWAYAM/NPTEL/ MOOC platform)**

Track 1-Information Security

1. Information Security - 5 - Secure Systems Engineering(noc24-cs31)-12 week
2. Foundations of Cryptography(noc24-cs01)-12week

Track 2-IoT

1. Introduction To Industry 4.0 And Industrial Internet Of Things (noc24-cs34)-12 week
2. Sensors and Actuators(noc24-ee45)-12 week

Track 3- High Performance Computing

1. Parallel Computer Architecture(noc24-cs63)-12 week
2. Basics of Computational Complexity (noc24-cs05)-12 week

2) Courses for "Minor Specialization" VI Semester (CSE)

***Minor (SWAYAM/NPTEL/ MOOC platform)
(For students of other branches)**

1	Programming in Modern C++(noc24-cs44)-12week
2	Introduction To Internet Of Things(noc24-cs35)-12 week
3	Introduction to Automata, Languages and Computation(noc24-cs32)-12week

Courses for "Honours"- VIII Semester

***honours (SWAYAM/NPTEL/ MOOC platform)**

Edge Computing(noc24-cs66)-8week

Business Intelligence & Analytics(noc24-cs65)-12 week

Games and Information(noc24-cs64)-12week

Courses for "Minor Specialization"- VIII semester

***Minor (SWAYAM/NPTEL/ MOOC platform)
(For students of other branches)**

1	An Introduction to Artificial Intelligence(noc24-cs08)-12week
2	Introduction To Internet of Things(noc24-cs35)-12 week
3	Introduction to Automata, Languages and Computation(noc24-cs32)-12week

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Item 6	To review and finalize the scheme structure of B.Tech VI Semester under the flexible curriculum (Batch admitted in 2021-22) The scheme for B.Tech VI Semester, CSE discipline (under flexible curriculum) were discussed and finalized. The Scheme of CSE VI semester is enclosed in <u>Annexure- 2</u>								
Item 7	To review & finalize the syllabi for all Departmental Core Courses (DC) and Mandatory Course (MC) of B. Tech VI Semester (for batch admitted in 2021-22) under the flexible curriculum along with their COs. The syllabi for all Departmental Core Courses (DC) and Mandatory Course (MC) for B.Tech VI Semester, CSE discipline (under flexible curriculum) were discussed and finalized. The Syllabi of CSE VI semester is enclosed in <u>Annexure- 3</u>								
Item 8	To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered (for batches admitted in 2021-22) in online mode under Departmental Elective (DE-1) Course with credit transfer, in the VI Semester. The list of Departmental Elective (DE-1) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B.Tech VI Semester, CSE discipline (under flexible curriculum) were discussed and finalized, as per the following detail. <table><tr><th colspan="2">*DE-1 (SWAYAM/NPTEL/ MOOC platform)</th></tr><tr><td>150671</td><td>User-centric Computing For Human-Computer Interaction(noc24-cs50)-8 week</td></tr><tr><td>150672</td><td>Digital Design with Verilog (noc24-cs61)-12 week</td></tr><tr><td>150673</td><td>Getting Started with Competitive Programming (noc24-cs30)-12 week</td></tr></table>	*DE-1 (SWAYAM/NPTEL/ MOOC platform)		150671	User-centric Computing For Human-Computer Interaction(noc24-cs50)-8 week	150672	Digital Design with Verilog (noc24-cs61)-12 week	150673	Getting Started with Competitive Programming (noc24-cs30)-12 week
*DE-1 (SWAYAM/NPTEL/ MOOC platform)									
150671	User-centric Computing For Human-Computer Interaction(noc24-cs50)-8 week								
150672	Digital Design with Verilog (noc24-cs61)-12 week								
150673	Getting Started with Competitive Programming (noc24-cs30)-12 week								
Item 9	To review and finalize the courses & syllabi to be offered (for batch admitted in 2021-22) under the Open Category (OC) Courses (in traditional mode) for VI semester students of other departments along with their COs. The courses to be offered under Open Category (OC) Courses for B.Tech VI Semester (for the students of other departments) under flexible curriculum were discussed and finalized for Batch admitted in 2020-21. Subjects are: - <table><tr><th>Subject Code</th><th>Open Category (OC) Courses</th></tr><tr><td>910100</td><td>Data Structures</td></tr><tr><td>910101</td><td>Python Programming</td></tr></table> It is further discussed that the Open Category (OC) courses are meant only for the students of other departments; therefore, the above list of courses may be kept dynamic (as per the need and demand from other departments). Syllabus (along with their COs) are attached in <u>Annexure-4</u>	Subject Code	Open Category (OC) Courses	910100	Data Structures	910101	Python Programming		
Subject Code	Open Category (OC) Courses								
910100	Data Structures								
910101	Python Programming								
Item 10	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses to be offered in B.Tech.VI semester (for batch admitted in 2021-22). Experiment list/ Lab Manual for Laboratory Courses to be offered in VI (for batch admitted in 2021-22)is discussed and finalized Same is being attached in <u>Annexure5</u>								

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Item 11	To review and finalize the suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses to be offered in B.Tech. VI Semester (for the batch admitted in 2021-22). Skill based mini-project category in various laboratory components based courses to be offered in VI (for batch admitted in 2021-22) is discussed and finalized Same is being attached in <u>Annexure 6</u>
Item 12	To review and finalize the scheme and syllabi of B. Tech. IV Semester (for batch admitted in 2022-23) under the flexible curriculum along with their COs. The scheme for B.Tech IV Semester, CSE discipline (under flexible curriculum) were discussed and finalized. The Scheme of CSE IV semester is enclosed in <u>Annexure-7</u> The Syllabus of CSE IV semester is enclosed in <u>Annexure- 8</u>
Item 13	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses to be offered in Batch IV semester (for batch admitted in 2022-23) Experiment list/ Lab Manual for Laboratory Courses to be offered in IV (for batch admitted in 2022-23) is discussed and finalized Same is being attached in <u>Annexure 9</u>
Item 14	To review and finalize the suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses to be offered in B. Tech IV Semester (for the batch admitted in 2022-23). Skill based mini-project category in various laboratory components based courses to be offered in IV (for batch admitted in 2022-23) is discussed and finalized Same is being attached in <u>Annexure10</u>
Item 15	To review and finalize the scheme and syllabi of B. Tech. II Semester (for batch admitted in 2023-24) under the flexible curriculum along with their COs. The scheme for B.Tech II Semester, CSE discipline (under flexible curriculum) were discussed and finalized. The Scheme of CSE II semester is enclosed in <u>Annexure- 11</u> The Syllabus of CSE II semester is enclosed in <u>Annexure- 12</u>
Item 16	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses to be offered in Batch II semester (for batch admitted in 2023-24) Experiment list/ Lab Manual for Laboratory Courses to be offered in II (for batch admitted in 2023-24) is discussed and finalized Same is being attached in <u>Annexure13</u>
Item 17	To review and finalize the suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses to be offered in B. Tech IV Semester (for the batch admitted in 2023-24). Skill based mini-project category in various laboratory components based courses to be offered in II (for batch admitted in 2023-24) is discussed and finalized Same is being attached in <u>Annexure14</u>
Item 18	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 2023 Session

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	Annexure-15
Item 19	To review the PO attainment, CO-PO mapping matrix and action to be taken to improve PO attainment level. Annexure-15(A)
Item 20	To review curricula feedback from various stakeholders, its analysis and impact. Annexure-16
Item 21	To discuss and recommend the scheme structure & syllabi of PG Programme along with their Course Outcomes (COs) The scheme for M.Tech II Semester, CSE was discussed and finalized. Scheme: <u>Annexure-17</u> Syllabus: <u>Annexure-17A</u>
Item 22	To recommend the scheme structure and Syllabus of Ph.D. Course Work (specific to Doctoral Research Scholars, if any)
Item 23	Any other matter.

A collection of approximately 12 handwritten signatures in black ink, arranged in a loose grid-like pattern. The signatures vary in style, with some being more legible and others being more stylized or cursive. Some signatures appear to be initials or abbreviated names.

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

(For batch admitted in academic session 2020-21)

MCQ: Multiple Choice Question	AO: Assignment + Oral	PP: Pen Paper	SO: Submission + Oral
11. All of these courses will run throughout the year. 12. All of these courses will run throughout the year.			

MCQ: Multiple Choice Question	AO: Assignment + Oral
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All of these courses will run through SWAYAM/NPTEL/ MOOC with credit transfer

evaluation will be based on participation/laurels brought by the students to the institution.

participation in professional chapter activities, club activities, cultural events, sports, personality development activities, collaborative events, MOOCs, technical events, institute (department) seminar/convention in non-graduate level technical and other events during the complete tenure of the UG programme.

Mode of Teaching										
Theory			Lab		PD	Mode of Examination				
Offline	Online	Blended	Offline	Online	Interactive	PP	AO	MCQ	SO	NEC
-	-	06	09	-	02	-	-	06	09	02
-	-	35.29%	52.95%	-	11.76%	-	-	35.29%	52.95%	11.76%
										Total Credits
										17
										Credits ^a _{in}

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*DE-5 (SWAYAM/NPTEL/ MOOC platform)		*Open Category (OC-3) (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)
150861	GPU Architecture and Programming (noc24-cs30)-12 week	Data Analytics with Python (noc24-cs26)-12 WEEK
150862	Introduction To Soft Computing (noc24-cs37)-12 week	Advanced Computer Networks (noc24-cs11)-12 WEEK
150863	Selected Topics in Algorithms (noc24-cs46)-12 week	Affective Computing (noc24-cs12)-12 week
150864	Foundations of Cyber Physical Systems (noc24-cs27)-12 week	Linear programming and its applications to computer science
150865	Probability of Computer science (rectified) in next Ed	

ret

*Minor (SWAYAM/NPTEL/ MOOC platform) (For students of other branches)		*honors (SWAYAM/NPTEL/ MOOC platform)
1	An Introduction to Artificial Intelligence(noc24-cs08)- 12week	Edge Computing(noc24-cs66)-8week
2	Introduction To Internet Of Things (noc24-cs35)-12 week	Business Intelligence & Analytics(noc24-cs65)-12 week
3	Introduction to Automata, Languages and Computation(noc24-cs32)- 12week	Games and Information(noc24-cs64)-12week

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Department of Computer Science & Engineering
Scheme of Evaluation

B. Tech. VI Semester (Computer Science & Engineering)

(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			Mode of Teaching	Grade
				Theory Slot				Practical Slot			MOOCs								
				End Sem. Exam.	End Term Evaluation	Continuous Evaluation		End Sem. Exam.	Continuous Evaluation	Skill Based Mini Project	Assignment	Exam							
						Proficiency in subject /course	Mid Sem. Exam.						Quiz/ Assignment						
1.	150615	DC	Cloud Computing & Virtualization	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Online	PG
2.	150616	DC	Digital Image Processing	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Online	PG
3.		DE	Departmental Elective* (DE-1)	-	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	PG
4.		OC	Open Category (OC-1)**	50	10	20	20	-	-	-	-	-	100	3	-	-	3	Online	PG
5.	150617	DC	Machine Learning	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Online	PG
6.	150618	DLC	Minor Project-II	-	-	-	-	60	40	-	-	-	100	-	-	4	2	Online	PG
7.	200XXX	CLC	Novel Engaging Course (Informal Learning)	-	-	-	-	50	-	-	-	-	50	-	-	2	1	Interactive	PG
Total				200	40	80	80	290	100	60	25	75	950	15	-	12	21	-	-
8.	1000007	MAC	Intellectual Property Rights (IPR)	50	10	20	20	-	-	-	-	-	100	2	-	-	GRADE	Online	MAC

Summer Internship-III (On Job Training) for Four weeks duration: Evaluation in VII Semester

Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization

Additional Course for Honours or minor Specialization

⁵⁵ Proficiency in course/subject includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

⁵⁵ MCQ: Multiple Choice Question ⁵⁵ AO: Assignment + Oral ⁵⁵ PP: Pen Paper ⁵⁵ SO: Submission + Oral

*Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform with credit transfer

** Course run in traditional mode

*This course run through SWAYAM/NPTEL/ MOOC platform

**Open Category (OC-1): For students of other branches)

150671	User-centric Computing For Human-Computer Interaction(noc24-es50)-8 week	910100	Data Structures
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150672	Digital Design with Verilog (noc24-cs61)-12 week	910101	Python Programming
150673	Getting Started with Competitive Programming (noc24-cs30)-12 week		

		Mode of Teaching				Mode of Examination				Total Credits
		Theory		Lab		Theory		Lab		
				Offline	Online					
Offline	Online	Offline	Online	Offline	Online	PP	A+O	MCQ	SO	SO
12	3	-	-	5	1	15	-	3	2	1
57.14	14.28	-	-	23.8	4.76	71.42	-	14.28	9.52	4.76
										21

***Minor (SWAYAM/NPTEL/ MOOC platform)**
(For students of other branches)

***Honours (SWAYAM/NPTEL/ MOOC platform)**

1	Programming in Modern C++(noc24-cs44)-12 week		Track1-Information Security 1. Information Security - 5 - Secure Systems Engineering(noc24-cs31)-12 week 2. Foundations of Cryptography(noc24-cs01)-12 week
2	Introduction To Internet Of Things(noc24-cs35)-12 week		Track 2-IoT 3. Introduction To Industry 4.0 And Industrial Internet Of Things (noc24-cs34)-12 week 4. Sensors and Actuators(noc24-ee45)-12 week
3	Introduction to Automata, Languages and Computation(noc24-cs32)-12 week		Track 3- High Performance Computing 5. Parallel Computer Architecture(noc24-cs63)-12 week 6. Basics of Computational Complexity (noc24-cs05)-12 week

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CLOUD COMPUTING AND VIRTUALIZATION

DC- 150615

Course Objectives:

1. To Provide the basics of cloud computing concepts along with virtualization techniques.
2. To provide overview of the field of Cloud Computing, and an in-depth study into its enabling technologies and main building blocks.
3. To develop the skills needed to become a practitioner or carry out research projects in this domain.

Unit I - Introduction:

Definition and evolution of cloud computing, Cloud components, Essential characteristics, advantages and limitations of cloud computing, Issues in cloud computing, Virtualization: Need of virtualization, Features of Virtualization, limitations, Classification of virtualization: Hardware virtualization, Desktop virtualization.

Unit II – Virtualization Concepts:

Server Virtualization: Introduction, types of server virtualization, Virtual machine basics, types of virtual machines, hypervisor concepts and types, Utility Computing, Elastic Computing, Virtualization applications in enterprises, Pitfalls of virtualization, Multitenant software, Virtualization security management, Datacenter Virtualization, Client Virtualization, Cloud Virtualization.

Unit III – Cloud Architecture:

Cloud architecture, Layers in cloud architecture, Service Models: Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Application as a Service, Functions as a Service, features and benefits of each. Deployment Models: Public clouds, Private clouds, Community clouds, Hybrid clouds.

Unit IV – Cloud Storage & Security:

Introduction to Storage Systems, Data in the cloud: Relational databases, Cloud Storage Concepts, Cloud file systems: GFS and HDFS. Cloud Databases (HBase, MongoDB, Cassandra, DynamoDB), Cloud Object Storage, Features and functions of cloud computing platforms, Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud: Cloud computing security architecture.

Unit V – Tools and Techniques:

Distributed Programming for the Cloud, Map-Reduce and extensions: Parallel computing, The Map-Reduce model, Example/Application of MapReduce, Introduction to Simulators, CloudSim simulator, GreenCloud simulator, VMWare Simulator, Oracle Virtual Box. Case Study: AWS.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOMES:

After successful completion of the course, the learners would be able to:

1. **Describe** the fundamental ideas behind Cloud Computing.
2. **Use** ideas and principles of Virtualization and its applications.
3. **Illustrate** fundamental concepts of cloud infrastructures and Service Oriented Architecture.
4. **Analyze** the fundamental concepts of cloud storage and cloud security.
5. **Apply** various tools and technologies for implementing applications of Cloud.

Reference Books:-

- Cloud computing a practical approach - Anthony T. Velte, Toby J. Velte Robert Elsenpeter, TATA McGraw- Hill, New Delhi – 2010
- Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008
- Kai Hawang, Geofrey C Fox, "Distributed and Cloud Computing", Elsevier publication, 2012
- David Marshall, Wade A. Reynolds, Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center, Auerbach

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DIGITAL IMAGE PROCESSING

DC-150616

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:

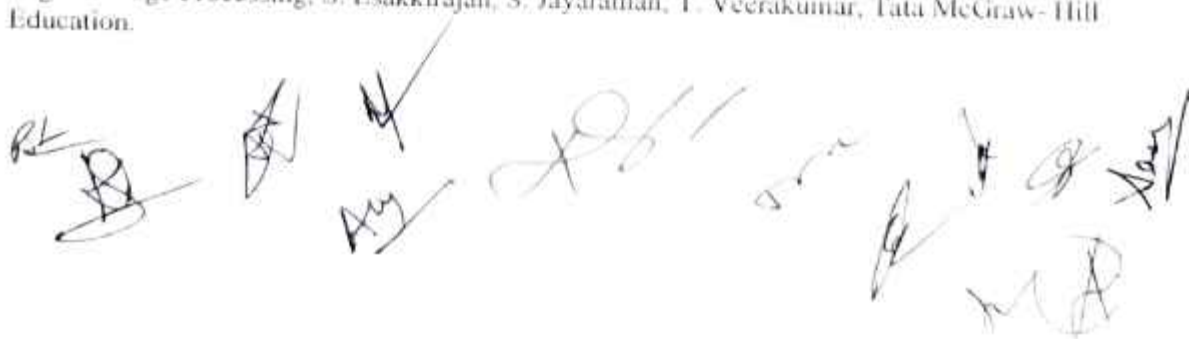
Morphological Image Processing: Logic operation involving binary images, Dilation and Erosion, Opening and Closing, Morphological Algorithms: Boundary Extraction, Region filling, Extraction of connected components, Convex Hull, Thinning and Thickening.

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.

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

1. **Explain** the fundamental concepts of Image Models and Image Geometry.
2. **Apply** Spatial Domain Techniques for Image Enhancement.
3. **Apply** Frequency Domain Techniques for Image Enhancement and Restoration.
4. **Categories** Morphological Image Processing operations.
5. **Apply** Geometric Transformations and Segmentation Techniques for Images.

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MACHINE LEARNING

DC-150617

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, 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

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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

1. **Explain** basic concepts of Machine Learning.
2. **Discuss** model optimization using scikit-learn technique in python.
3. **Apply** various techniques for learner evaluation.
4. **Illustrate** various types of supervised machine learning algorithm using python.
5. **Formulate** ML ensemble model to solve real world problem using python.
6. **Evaluate** unsupervised ML techniques to solve real world problems using python.

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DATA STRUCTURES
910100 (OC-I)

COURSE OBJECTIVES

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

Unit-I

Introduction to Data Structures: Algorithms & their Characteristics, Asymptotic Notations, Arrays and its Representations, Index to Address Translation. **Linked List:** Introduction, Implementation of Linked List, Operations, Circular Linked List, Doubly Linked List, Polynomial Manipulation using Linked List.

Unit-II

Stacks: Concepts and Implementation of Stacks, Operations on Stack, Conversion of Infix to Postfix Notation, Evaluation of Postfix Expression, Recursion.

Queues: Concepts and Implementation, Operations on Queues, Dequeue, Priority Queues, Circular Queues and Application.

Unit-III

Trees: Types, Terminology, Binary Tree -Representations, Traversal, Conversion of General Tree to Binary Tree, Binary Search Tree, Threaded Binary Tree and Height Balanced Tree.

Unit-IV

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

Unit-V

Searching & Sorting: Linear Search, Binary Search, Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Radix Sort and Heap Sort, Comparison between Sorting Techniques, Hashing and Collision Resolution Techniques.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

RECOMMENDED BOOKS

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

COURSE OUTCOMES

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

1. **Describe** the basics of Algorithms and their performance criteria's.
2. **Explain** the working of linear/Non Linear data structures.
3. **Identify** the appropriate data structure to solve specific problems.
4. **Analyze** the performance of various Data Structures & their applications.
5. **Evaluate** the time/space complexities of various data structures & their application

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PYTHON PROGRAMMING

910101 (OC-I)

COURSE OBJECTIVES

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

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Unit V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

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

1. Interpret the basic syntax and keywords in python programming.
2. Analyze various data structures available in python
3. Implement the Object-oriented programming paradigm in Python
4. Apply the different File handling operations
5. Design GUI Applications in Python

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CLOUD COMPUTING AND VIRTUALIZATION

DC- 150615

List of Experiments

1. Study of Cloud Service Models
2. Working with Goggle Drive to make spreadsheet and notes
3. Installation and configuration of Hadoop
4. Installation and configuration of Justcloud
5. Working and installation of CloudSim
6. Working and installation of GreenCloud
7. Working and installation of VMWare
8. Working and installation of Oracle Virtual Box
9. Working and installation of Google App Engine
10. Working and installation of Microsoft Azure
11. Study of Amazon Web Services

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DIGITAL IMAGE PROCESSING

DC-150616

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.


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MACHINE LEARNING

DC-150617

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 there accuracy using scikitlearn
 - Linear Regression
 - Polynomial Regression
 - Support Vector machine
5. Implement Logistic regressor using softmax on iris dataset using scikitlearn.
6. Implement Regularized Regression for house price prediction and evaluate there accuracy using scikitlearn.
 - Ridge Regression
 - Lasso Regression
7. Implement Various Classification algorithm for iris data set and evaluate there performance.
 - Navie Bayes Classifier
 - Logistic Regression
 - Support vector Machine
 - Decision tree
8. Implement Various ensemble on housing and iris dataset and evaluate there performance
 - Voting classifier
 - Random Forest (Bagging and pasting)
9. Implement principle component analysis on any choosen dataset/
10. Implement various clustering algorithm on choosen dataset

1. K-Mean

2. DBSCAN

BL

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CLOUD COMPUTING AND VIRTUALIZATION

DC- 150615

List of Skill Based Mini Projects

1. Cloud-Enabled Attendance System
2. Cloud-Enabled Bookstore System
3. Online Blood Bank System
4. Cloud-Based Bus Pass System
5. Online Education System
6. Cloud-Enabled Data Leak Detection System Using SQL Injection
7. Online Chatbot System
8. Cloud-Based File Storage System using Hybrid Cryptography
9. Cloud-Based Rural Banking
10. Cloud-Based Smart Traffic Management System

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DIGITAL IMAGE PROCESSING

DC-150616

Skill Based Mini Project

1. Read multiple images from a folder and show them using sub plotting operation.
2. Read an image given by the user and perform different filtering operations (Average, Median etc.)
3. Implement Smart selfie using image processing techniques.
4. Object detection (eg. Face mask, Number plate etc.)
5. Bookshop management system using Image processing techniques
6. Real time sentiment analysis.
7. Apply image segmentation techniques on original image given by the user.
8. Implement a GUI to enhance the image using Histogram equalization techniques.
9. Implement a GUI for Edge detection (Sobel, Prewitt, Canny etc.)
10. Execute the GUI for various segmentation methods using user given images.
11. Implement a GUI for similar images detection.



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MACHINE LEARNING
DC-150617

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.

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

S. No.		Subject Code	Subject Name	Maximum Marks Allotted										For batches admitted in Academic Session 2022-23		Onwards	
				Theory Slot					Practical Slot					Total	Contact Hours per week	Mode of Teaching (Offline/Online)	Mode of Exa. (Offline/Online)
				End Term Evaluation			Continuous Evaluation		End Sem.	Continuous Evaluation			Total Marks				
				End Term Evaluation	Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment		Lab Work & Sessional	Skill based mini project							
1.	2150411	DC	Computer Networks	50	10	20	20	20	60	20	20		200	3	2	3	39
2.	2150412	DC	Optimization Techniques	50	10	20	20	20	-	-	-		100	2	1	1	39
3.	2150413	DC	Data Mining & Warehousing	50	10	20	20	20	60	20	20		200	3	2	4	39
4.	2150414	DC	Theory of Computation	50	10	20	20	20	-	-	-		100	2	1	2	39
5.	2150415	DC	Artificial Intelligence	50	10	20	20	20	-	-	-		100	3	-	2	39
6.	2150416	DLC	Programming Lab	-	-	-	-	-	60	20	20		100	-	4	2	39
7.	200/XXX	CLC	Novel engaging courses						50	-	-		50	-	2	-	50
Total				250	50	100	100	100	230	60	60		850	13	2	10	20
8.	1000021	MAC	Indian Constitution and Traditional Knowledge	50	10	20	20	20	-	-	-		100	2	-	Grade	50
9.	3000005	Natural Sciences & Skills	Environmental Engineering	50	10	20	20	20	-	-	-		150	2	-	Grade	50
Summer Internship Project-II (Soft skills Based) for two weeks duration: Evaluation is to be done by the Institute.																	

Mr. Q. Multiple Choice Question
Proficiency in course/subject - includes the weightage towards ability/skill/ competence /knowledge level /expertise attained /attendance, one minute paper writing etc. in that particular course/subject/CLASS. Change will not be change
ACB is 10% (V semester) actively

Mode of Teaching				Mode of Examination				Total Credits	
Theory		Lab		Theory		Lab		Total Credits	
Offline	Online	Blended	Online	PP	A+O	MCQ	SO	Total Credits	
10	10	10	10	17	-	-	2	20	
55	25	15	15	85	-	-	10	Credits %	

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Department of Computer Science and Engineering

COMPUTER NETWORKS
2150411 (DC)

COURSE OBJECTIVES

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

Unit-I

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

Unit-II

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

Unit-III

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

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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.

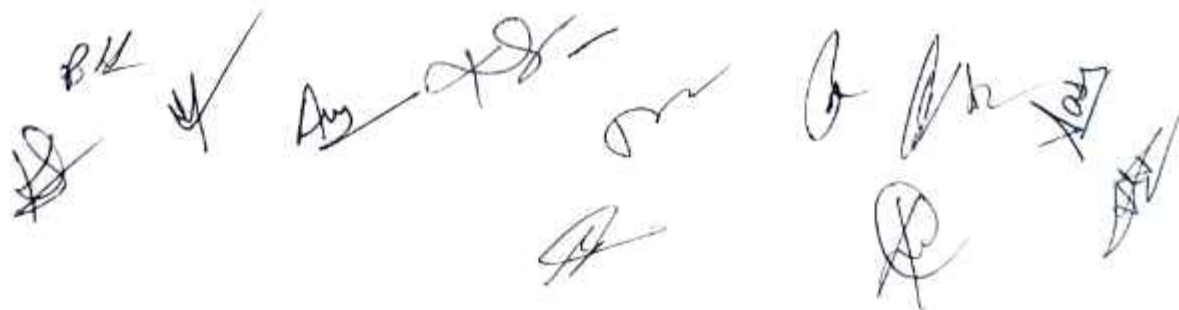
RECOMMENDED BOOKS

- 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:

1. **Categorizing** the components of data communication system
2. **Illustrate** the different types of network topologies, protocols, networks devices, transmission media
3. **Evaluate** channel allocation, framing, Error and flow control techniques.
4. **Describe** the functions of Network Layer and Transport Layer functions.
5. **Elaborate** the functions offered by session, presentation, and application layer and their Implementation.

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Department of Computer Science and Engineering

Optimization Techniques

2150412

COURSE OBJECTIVES:

- Understand the role of optimization in engineering applications.
- Define optimization problems and emphasize the importance of clear problem statements.
- Categorize optimization problems based on their characteristics and constraints.
- Differentiate between global and local optima and their implications in optimization.
- Explore concepts related to optimal design and their significance in engineering.

Unit 1: Introduction to Optimization

Overview of Optimization: Understanding the role of optimization in engineering applications. Problem Formulation: Defining optimization problems, emphasizing the importance of clear problem statements. Classification: Categorizing optimization problems based on their characteristics and constraints.

Unit 2: Optimum Design

Optimal Design Concepts: Exploring concepts related to optimal design and their significance in engineering. Global vs. Local Optima: Differentiating between global and local optima, and their implications in optimization. Optimality Criteria: Introduction to criteria used to evaluate optimality, ensuring a comprehensive understanding. Basic Calculus Review: Revisiting fundamental calculus concepts relevant to optimization problems. Global Optimality: Examining the concept of global optimality and its application in engineering scenarios.

Unit 3: Linear Programming

Introduction to linear programming (LP), Formulation of linear programming problems, Graphical method for solving two-variable LP problems, Matrix notation and operations, Vector spaces and linear independence

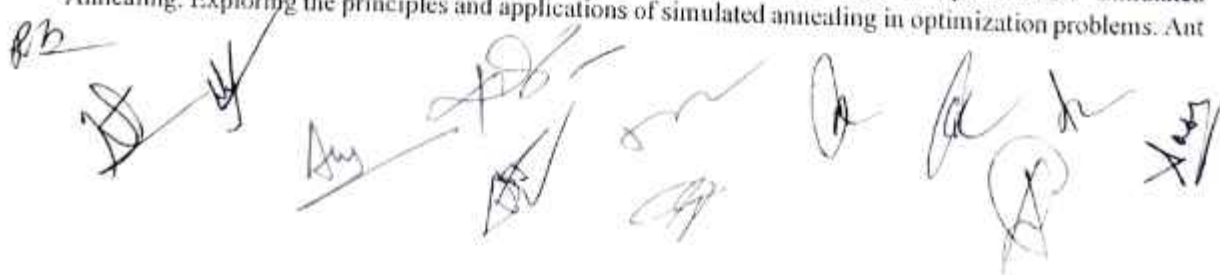
Unit 4: Optimization Algorithms for Unconstrained and Constrained Optimization Problems

The distinction between constrained and unconstrained optimization. Basics of Gradient Descent: Introduction to gradient-based optimization, Gradient Descent algorithm. Steepest Descent: Understanding the steepest descent method, Comparison with traditional gradient descent, Applications and limitations. Newton's Method: Second-order optimization with Newton's method, Hessian matrix and convergence analysis.

Unit 5: Modern Methods of Optimization

Genetic Algorithms: Introduction to genetic algorithms and their role in optimization. Simulated Annealing: Exploring the principles and applications of simulated annealing in optimization problems. Ant

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Colony Optimization: Understanding the concepts and applications of ant colony optimization. Fuzzy Optimization Techniques: Introduction to fuzzy optimization techniques and their practical applications.

RECOMMENDED BOOKS:

- Jorge Nocedal, Stephen J. Wright: Numerical Optimization.
 - Andreas Antoniou, Wu-Sheng Lu: Practical Optimization
 - Stephen Boyd, and Lieven Vandenberghe: Convex Optimization
-

COURSE OUTCOMES:

After completing this course, the students will be able to:

1. Describe fundamental concepts of optimization, including its role in engineering applications.
 2. Describe a clear understanding of the importance of formulating optimization problems.
 3. Apply their knowledge by classifying optimization problems, formulating linear programming problems.
 4. Analyze optimization algorithms such as gradient descent, steepest descent, Newton's method, and direct methods for constrained optimization.
 5. Differentiate between global and local optima, evaluating optimality criteria.
 6. Evaluate optimization methods, comparing their efficiency, limitations, and practical applications.
-

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Department of Computer Science and Engineering
DATA MINING & WAREHOUSING

2150413

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.

RECOMMENDED BOOKS

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

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

1. **Classify** various databases systems and data models of data warehouse.
2. **Compare** various methods for storing and retrieving data from different data sources/repository.
3. **Apply** preprocessing techniques for construction of data warehouse.
4. **Analyze** data mining for knowledge discovery & prediction.
5. **Explain** data mining methods for identification of association for transactional databases.
6. **Develop** various classification and clustering algorithms for data using data mining.

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P

2150414 (DC)

- 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.

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.

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.

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).

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.

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).

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RECOMMENDED BOOKS

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

COURSE OUTCOMES

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

1. **Describe** the basic concepts of switching and finite automata theory & languages.
2. **Compute** abstract models of computing and check their power to recognize the languages.
3. **Analyse** the grammar, its types, simplification and normal form.
4. **Design** mathematical models to prove properties of languages, grammars and automata.
5. **Apply** automata theory, languages and computation in engineering application.



Department of Computer Science and Engineering

ARTIFICIAL INTELLIGENCE

2150415

Course Objectives:

- To acquire knowledge on intelligent systems and agents.
 - Formalization of knowledge, reasoning with, machine learning, Fuzzy Logic and Applications at a basic level.
-

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: Informed search and Uninformed search, Breadth search and Depth first search, Best First Search, Heuristic search. Heuristic estimation and evaluation, Hill climbing and their Problems.

Unit: 3

Knowledge Representation: Introduction, 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

Learning Algorithms: Introduction of algorithms, characteristic of algorithm, Introduction of Machine Learning, Supervised learning, Unsupervised learning, Reinforcement learning. Logical reasoning: Fuzzy Logic, operations of fuzzy logic. Forward Versus Backward Reasonings. Artificial Intelligence in Mathematics: Statistical concept (Mean, mode, median, standard deviation), Bayes theorem.

Unit: 5

Applications of Artificial Intelligence: Emerging fields of Artificial Intelligence, Introduction of Data science, Natural Language Processing, Speech Recognition, Computer Vision and robotics, Smart Assistants, Game Playing, Puzzles. Expert System: Expert System Definition and its components.

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RECOMMENDED BOOKS

- Artificial Intelligence–Rich & Knight
- Artificial Intelligence and Expert System–Dan. W. Patterson
- Principles of Soft Computing, S. N. Sivanandam and S. N. Deepa , Wiley

COURSE OUTCOMES:

After successful completion of the course, the learners would be able to:

1. **Explain** the basic concepts of Artificial Intelligence and its Applications.
2. **Classify and Compare** the various informed, uninformed and heuristic searching techniques.
3. **Classify and Compare** the various informed, uninformed and heuristic searching techniques.
4. **Illustrate** formal methods of Knowledge Representation.
5. **Evaluate** the various Machine Learning Algorithms for problem solving.
6. **Develop** a model based on Artificial Intelligence techniques.

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Department of Computer Science and Engineering
PROGRAMMING LAB. (ROBOTICS AND AUTOMATION)
2150416(DLC)

COURSE OBJECTIVES

- To provide the fundamental concepts and principles of digital electronics and its components.
- To know about the importance of sensors and actuators in IOT.
- Practical exposure of robotics and automation using arduino, raspberry Pi, etc.
- Explore the fundamentals of robotics along with various robot navigation and localization techniques.

Unit -I

Introduction to Digital Electronics: Digital vs Analog Systems, Logic Gates and Truth Tables, Designing Combinational Circuits, Multiplexers and Demultiplexers, Half Adder and Full Adder, SR, JK, D, and T Flip-Flops, Registers and Counters.

Unit- II

Introduction to Arduino & IOT: Setup the IDE, Arduino Software ,Arduino Libraries, Basic programming for Arduino, Analog input and analog output on Arduino Mega board using PWM ,Interfacing LED, push button and buzzer with Arduino ,Interfacing Arduino with LCD, Understanding IoT fundamentals, IOT Architecture and protocols, Understanding Raspberry Pi and Jetson nano.

Unit -III

Robotic Sensors & Actuators: Overview of Sensors working , Analog and Digital Sensors, Interfacing of Temperature and Humidity, IR and Ultrasonic sensors, Motion Sensor, Lidar, Gyroscope, Magnetometer, Camera and Color sensor, Interfacing of Relay Switch and Servo Motor, DC Motor Control, Stepper Motor Control, Gear Motor, Kinematics of Robotic Arms,

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Computer Vision in Robotic Arms, Object Recognition and Tracking

Unit -IV

Fundamentals of Robotics: Types and Applications of Robots, Control Systems in Robotics, Kinematics and Dynamics, Robot Localization: Odometry-Based Localization, Beacon-Based Localization, Map-Based Localization, Grid-Based Localization, Robot Navigation: Path Planning, Local Navigation, Collision Avoidance, SLAM-Based Navigation.

Unit-V

Application of Industrial Automation: Smart Metering, e-Health Body Area Networks, City Automation, Automotive Applications, Home Automation, Health and Safety Monitoring Smart Cards, Plant Automation, Real life examples of IIOT in Manufacturing Sector.

RECOMMENDED BOOKS

- "Internet of Things (IoT): A Hands-On Approach" by Arshdeep Bahga and Vijay.
- "Raspberry Pi Cookbook" by Simon Monk.
- "Introduction to Autonomous Robots" by Nikolaus Correll
- "Robot Dynamics and Control" by Mark W. Spang
- "Industry 4.0: The Industrial Internet of Things" by Alasdair Gilchrist

COURSE OUTCOMES

After completion of the course students would be able to:

1. **Implement** arduino programming code for different problems.
2. **Analyze** and understand fundamental of robotics.
3. **Explore** the integration of different sensor and actuators.

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Department of Computer Science and Engineering

COMPUTER NETWORKS
2150411 (DC)

List of Experiments

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

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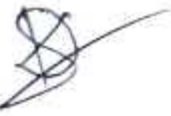
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Data Mining & Warehousing

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)











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Department of Computer Science and Engineering

Programming Lab.(Robotics And Automation)
2150416(DLC)

1. Design a circuit for adding two numbers
2. Design a circuit to count number from 1 to 7
3. Experiments on analog input and analog output on Arduino Mega board using PWM
4. Experiments on DC motors to control motor speed and direction of rotation
5. Experiments on servo motor to rotate servo motor and stepper motor to rotate bidirectional
6. Getting started with Raspberry Pi, Install Raspian on your SD card
7. Getting started with Python-based IDE (integrated development environments) for the Raspberry Pi and to trace and debug Python code on the device
8. Design and control a robotic gripper
9. Design a Line Follower robot
10. Design an obstacle avoidance and object follower robot
11. Implement grid based robot navigation
12. Implement automated waste segregator

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Department of Computer Science and Engineering

COMPUTER NETWORKS
2150411 (DC)

List of Skill Based Project

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

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Department of Computer Science and Engineering

Data Mining & Warehousing

DC-2150413

Design the following applications:

1. Housing Price Predictions
2. Smart Health Disease Prediction Using Naive Bayes
3. Handwritten Digit Recognition
4. Movie Recommendation System
5. Breast Cancer Detection
6. Credit Risk Assessment
7. Sales forecasting using Walmart dataset
8. Dmart sales prediction
9. Music recommendation system
10. Detecting suicidal tendency
11. Weather forecasting using data mining
12. Customer behavior prediction using web usage mining
13. Uber data analysis
14. Home Loan Prediction system
15. 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.,)

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Department of Computer Science and Engineering

Programming Lab. (Robotics And Automation)
2150416(DLC)

1. Install Android SDK and create an environment.
2. Experiment on LCD display:-Print numbers, Name, Time etc.
3. Experiments on analog input and analog output on Arduino Mega board using PWM
4. Experiments on DC motors to control motor speed and direction of rotation
5. Experiments on servo motor to rotate servo motor and stepper motor to rotate bidirectional
6. Getting started with Raspberry Pi, Install Raspbian on your SD card
7. Getting started with Python-based IDE (integrated development environments) for the Raspberry Pi and to trace and debug Python code on the device
8. Design and control a robotic gripper
9. Design a Line Follower robot
10. Design an obstacle avoidance and object follower robot
11. Implement grid based robot navigation
12. Implement automated waste segregator

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

B. Tech. II Semester (Computer Science and Engineering)																		
(for batch admitted in academic session 2023-24)																		
S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted										Total Marks	Contact Hours per week	Total Credits	Mode	
				Theory Slot			Practical Slot				End Sem. Exam	Total						
				End Term Evaluation		Continuous Evaluation		Continuous Evaluation		Lab Work & Sessional			Skill Based Mini Project					
				End Sem. Exam	Proficiency in subject /course	Mid Sem. Exam	Quiz/Assignment	Lab Work & Sessional	Skill Based Mini Project									
1.	3150221	DC	Data Structures	50	10	20	20	40	30	30		200	2	1	3	4	Blended	2 Hrs
2.	3150222	DC	Object Oriented Programming & Methodology	50	10	20	20	40	30	30		200	3	2	3	3	Blended	2 Hrs
3.	3150223	DC	Computer System Organization	50	10	20	20	-	-	-		100	2	1	-	3	Blended	2 Hrs
4.	3150224	DC	Computer Graphics	50	10	20	20	40	30	30		200	3	2	-	4	Blended	2 Hrs
5.	3100025	BSC	Engineering Mathematics -II	50	10	20	20	-	-	-		100	3	2	-	4	Blended	2 Hrs
6.	3150225	DI/C	Hardware and Troubleshooting (Lab)	-	-	-	-	40	30	30		100	3	-	-	3	Online	2 Hrs
Total				250	50	100	100	160	120	120	10	900	13	02	08	19		
7.	3000000	Natural Sciences & Skills	Engineering Physics	50	10	20	20	30	10	10		150	1	-	2	3	Blended	1.5 Hrs
Induction programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.																		
Proficiency in course/subject - includes the weightage towards ability/skill/ competency /knowledge level /expertise attained etc. in that particular course.																		
Natural Sciences & Skills: Engineering Physics / Engineering Chemistry / Environmental Science / Language																		
Q: Multiple Choice Question AO: Assignment Natural Science																		

AO: Assignment Natural Sciences & Skills / Language

	Theory						Practical / Application						
	Online		Blended		Lab.								
	Offline		Offline	Online	Online		MCQ			Other Assessment			
3							PP	AO	MCQ	Lab			
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			42	21	21		74	21		19			

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DATA STRUCTURES
(3150221) (DC)

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

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

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

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

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

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

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

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Unit-V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

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

1. **Describe** the basics of Algorithms and their performance criteria's.
2. **Explain** the working of linear/Non Linear data structures.
3. **Identify** the appropriate data structure to solve specific problems.
4. **Analyze** the performance of various Data Structures & their applications.
5. **Evaluate** the time/space complexities of various data structures & their applications.

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Department of Computer Science and Engineering

Object Oriented Programming & Methodology
3150222 (DC)

COURSE OBJECTIVES

- To study about the concept of object oriented programming.
- To create C++ programs that leverage the object oriented features of the C++ Language.
- To apply object oriented or non-object oriented techniques to solve bigger computing problems.

Unit-I

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

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

Unit-II

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

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

Unit-III

Polymorphism: Introduction, Type of Polymorphism: Compile Time Polymorphism & Run Time Polymorphism, Function Overloading, Operator Overloading: Binary Operators, Arithmetic Assignment Operators, Unary Operators, Rules for Operator Overloading, Pitfalls of Operator Overloading, Data Conversion, Type Casting.

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Unit-IV

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

Unit-V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

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

1. **Describe** various fundamental of object oriented design for programming practices..
 2. **Apply** fundamental Object-Oriented Programming principles such as encapsulation, inheritance, and polymorphism in real problem.
 3. **Develop** robust and scalable software systems and applications.
 4. **Create** modular, maintainable, and extensible code that adheres to industry best practices.
 5. **Evaluate** Object-Oriented solutions and make informed design decisions.
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Department of Computer Science and Engineering

**COMPUTER SYSTEM ORGANIZATION
(DC)(3150223)(new)**

COURSE OBJECTIVES

- To provide the fundamental knowledge of a computer system and its processing units.
- To provide the details of input & output operations, memory management and performance measurement of the computer system.
- To understand how computer represents and manipulate data.

Unit -I

Introduction: Von-Neumann Model, Various Subsystems: Input Unit, Output Unit, Memory Unit, CPU, System Bus, Program Counter, Accumulator, Memory Register, Register Transfer and Micro Operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Register Transfer Micro Operations, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro- Operations.

Unit- II

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

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

Unit -III

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

Unit -IV

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

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

Unit-V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students would be able to:

1. Recall the basic building blocks of computer Architecture.
2. and the functional units of a processor.
3. of working of microprocessor, multiprocessor and pipelining.
4. Analyze various modes of Input-Output data transfer.
- 5.
6. Develop the skill of writing low level programming.

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

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Department of Computer Science and Engineering

**COMPUTER SYSTEM ORGANIZATION
(DC) 2150223(old)**

COURSE OBJECTIVES

- To provide the fundamental knowledge of a computer system and its processing units.
- To provide the details of input & output operations, memory management and performance measurement of the computer system.
- To understand how computer represents and manipulate data.

Unit-I

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

Unit- II

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

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

Unit -III

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

Unit-IV

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

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

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory- Organization and Mappings, Memory Management Hardware.

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students would be able to:

- CO1. Recall the basic building blocks of computer Architecture.
- CO2. [redacted] memories and the functional units of a processor.
- CO3. [redacted] of working of microprocessor, multiprocessor and pipelining.
- CO4. Analyze various modes of Input-Output data transfer.
- CO5. [redacted]
- CO6. Develop the skill of writing low level programming.

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Department of Computer Science & Engineering

COMPUTER GRAPHICS 3150224(DC)

COURSE OBJECTIVES

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

Unit-I

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

Unit-II

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

Unit-III

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

Unit-IV

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

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Unit-V

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

RECOMMENDED BOOKS

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

COURSE OUTCOMES

After completion of the course students will be able to:

1. Apply graphics principles to new and evolving application domains.
2. Identify and troubleshoot common issues related to computer graphics rendering.
3. Implement graphics algorithms for tasks such as clipping, rasterization, and shading.
4. Apply mathematical transformations to manipulate and transform graphical objects.
5. Grasp the key concepts of 2D and 3D graphics representation.
6. Demonstrate ethical considerations in the use and creation of computer graphics.

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Department of Computer Science and Engineering

Hardware and Troubleshooting Lab

3150225(DLC)

COURSE OBJECTIVES:

- To understand various number systems, boolean algebra, logic Gates.
- To acquire the knowledge of a computer system, motherboard and its processing unit.
- To be aware of different memories, I/O devices, installation and SMPS.

Unit – I:

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

Unit – II:

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

Unit – III:

Sequential Circuits, Latches, Flip-Flops: Edge-triggered D Flip-flop, Edge-triggered JK Flip-flop, JK Master-slave Flip-flop, Registers. Integrated circuits.

Unit – IV:

Introduction of Motherboard, components of Motherboard, Types of Motherboard, Bios, Form-factor, CPU Sockets, types of memory sockets, IDE Ports, chipset, Integrated Peripherals, Peripheral card slots, Bootstrapping process.

Unit – V:

Introduction to Memory, Types of Memory, Installation and Partition of Hard Disk, Working of HDD and SDD. Basics of I/O Devices, Buffering and spooling, Introduction to Ports, Identify the Different Ports, Ports Troubleshooting. Linux and Windows Installation. SMPS (Switch Mode Power Supply).

RECOMMENDED BOOKS:

- Digital Design, Morris Mano M. and Michael D. Ciletti, IV Edition, Pearson Education.
- Digital Electronics: Principles, Devices and Applications, Anil K. Maini, Wiley.
- The Indispensable PC Hardware Book, Hans-Peter Messmer, Third Edition.

COURSE OUTCOMES:

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

1. **Displays** the features & functions of Motherboard, BIOS, Harddisk and other devices.
2. **Assemble** and Disassemble the Computer System.
3. **Perform** installation of system & application software as well as troubleshooting

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DATA STRUCTURES
(3150221) (DC)
List of Experiments

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

1. Implementation of Array and linked list.
2. Implementation of Sorting Algorithms-Non-Recursive and Recursive.
3. Implementation of Searching Algorithms-Linear and Binary Search.
4. Implementation of Stack using Array.
5. Implementation of Queue using Array.
6. Implementation of Circular Queue using Array.
7. Implementation of Stack using Linked List.
8. Implementation of Queue using Linked List.
9. Implementation of Circular Queue using Linked List.
10. Implementation of Tree Structures, Binary Tree, Tree Traversal, Binary Search Tree, Insertion and Deletion in BST.
11. Graph Implementation, BFS, DFS, Minimum cost spanning tree, shortest path algorithm.

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Object Oriented Programming & Methodology
3150222 (DC)

List of Experiments

1. Write a program to swap two integers without using third variable. The swapping must be done in a function of a particular class.
2. Write a program that uses a class where the member functions are defined outside a class.
3. Design a class to represent a bank account. Which includes account number, name of the depositor, type of the account, balance amount in the account. Define Methods, to assign initial values, to Deposit an amount, to Withdraw amount after checking balance, to display name and balance.
4. Write a program to find the greater of two given numbers in two different classes using friend function.
5. Create an inheritance hierarchy of Rodent, Mouse, Gerbil, Hamster etc. In the base class provide methods that are common to all Rodents and override these in the derived classes to perform different behaviors, depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents and call your base class methods.
6. Create two classes: Polar and Cartesian, to represent Polar and Cartesian coordinates of a point. Demonstrate how to convert Polar coordinates to Cartesian coordinates by writing the conversion code in source class.
7. Write a program to demonstrate anomaly caused in Multi-path Inheritance. Also, write a program to overcome the anomaly.
8. Create an abstract class Shape which has a field $P1=3.14$ as final and it has an abstract method Volume. Make two sub-classes 'Cone' and 'Sphere' from this class and they should print their volume.
9. Create a class called LIST with two pure virtual function store() and retrieve(). To store a value call store and to retrieve call retrieve function. Derive two classes stack and queue from it and override store and retrieve.
10. Write a program to demonstrate working of various file handling operations in C++.

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Department of Computer Science & Engineering

COMPUTER GRAPHICS
3150224(DC)

List of Experiments

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

[Handwritten signatures and initials are present below the list of experiments, including "Am", "BH", and several other illegible signatures.]



**DATA STRUCTURES
(3150221) (DC)
Skill-Based Mini Project List**

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

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

Handwritten signatures and initials are present below the note, including "AV", "BH", and several other illegible marks.



Object Oriented Programming & Methodology
3150222 (DC)

Skill-Based Mini Project List

1. 'Movie World' Shop has a huge collection of movies (in the form of DVDs). You are required to make software using OOPS paradigm that manages the rental operations of movies.
2. Question Bank computerizes the MCQ based exams. It takes input from a file having questions and their answers and presents randomly before the exam takers. Use OOPS concepts to implement the question bank system.
3. Design an OOPS to implement the basic operations of Leave Management System.
4. An Inventory System computerizes the Stock, Sale and Purchase of goods. Design an OOPS to implement it.
5. An electricity board charges the following rates to domestic users to discourage large consumption of energy: For the first 100 units - 60P per unit For next 200 units - 80P per unit Beyond 300 units - 90P per unit All users are charged a minimum of Rs.50.00. if the total amount is more than Rs.300.00 than an additional surcharge of 15% is added. Design an OOPS system to register users to the system, maintain his/her record and display monthly bills.
6. Library Systems is aimed to computerize the library management operations, e.g. Registering a Student, Issuing a book, Handling Books Return, etc. Design an OOPS system to implement the same.
7. Design an OOPS to implement a Personal Diary Management System.

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

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**COMPUTER GRAPHICS
3150224(DC)**

Skill Based Mini Projects List

1. Develop a project to implement a stretch band effect. In which a user will click on the screen and drag the mouse / arrow keys over the screen coordinates. The line should be updated like rubber-band and on the right-click gets fixed.
2. Develop a project to implement the DDA algorithm for drawing line. In this project a programmer is expected to shift the origin to the center of the screen and divide the screen into required quadrants.
3. Develop a project with menu option to input the line coordinates from the user to generate a line using Bresenham's method and DDA algorithm.
4. Develop a project to demonstrate 2D animation such as clock simulation.
5. Develop a project to demonstrate 2D animation such as rising sun.
6. Develop a project to implement the bouncing ball inside a defined rectangular window.
7. Develop a project to draw Bezier and B-Spline Curves with interactive user inputs for control polygon defining the shape of the curve.
8. Develop a project to demonstrate shear transformation in different directions on a unit square situated at the origin.
9. Develop a project in which a set of lines and a rectangular area of interest is given by user, the task is to remove lines which are outside the area of interest and clip the lines which are partially inside the area.





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Hardware and Troubleshooting Lab 3150225(DLC)

Skill Based Mini Projects List

- To create a multiple Star topology.
- To connect a multiple hard disk drive in a computer and then create a multiple volume.
- To create multiple Wi-Fi access network.
- How to do complete pc assembling.
- To create a domain server with a client.
- To create a DHCP server and assign dynamic IP address in a local pc
- Explain in detail to install multiple windows in a pc
- To create pair to pair network
- To create combine LAN & WAN network.
- To describe IP address and a connect pc different network IP address.

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NAAC Accredited with A+ + Grade

3150224(DC)

Skill Based Mini Projects

1. Develop a project to implement a stretch band effect. In which a user will click on the screen and drag the mouse / arrow keys over the screen coordinates. The line should be updated like rubber-band and on the right-click gets fixed.
2. Develop a project to implement the DDA algorithm for drawing line. In this project a programmer is expected to shift the origin to the center of the screen and divide the screen into required quadrants.
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8. Develop a project to demonstrate shear transformation in different directions on a unit square situated at the origin..
9. Develop a project in which a set of lines and a rectangular area of interest is given by user, the task is to remove lines which are outside the area of interest and clip the lines which are partially inside the area.



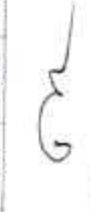
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Department : Computer Science & Engineering

Year 2022-2023

S.No.	Course Code & Name	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	P013
1	Computer System Organization-150223	55.40	46.30	42.40	44.90	32.00	56.50	51.50	54.80	54.10	56.40	53.20	55.00	51.50
2	150102: Data Structures	79.20	69.71	51.11	64.86	52.74	37.39	37.39	41.86	60.12	52.74	53.71	55.71	51.41
3	Computer Graphics-150224	56.65	72.01	41.50	74.78	28.39	66.43	38.58	64.50	79.30	51.41	54.84	55.48	53.79
4	Data Structures-250221	78.39	66.91	50.10	67.29	34.70	34.70	55.51	25.94	55.96	55.25	58.55	51.51	51.51
5	150102: Data Structures LAB	70.05	65.54	48.91	64.00	49.22	34.70	52.88	38.70	56.56	58.63	56.07	55.48	54.55
6	150303: Computer Graphics LAB	69.55	65.40	43.40	45.88	53.21	30.86	58.07	34.27	56.59	54.03	44.37	55.11	55.11
7	Computer System Organization-250223	74.00	59.09	51.00	50.09	41.57	41.69	52.31	40.20	54.85	54.85	54.85	54.85	54.85
8	Computer Graphics and Animation-250224	66.07	50.13	50.36	41.84	42.03	35.22	56.30	40.20	46.49	37.47	34.94	58.71	54.71
9	150312: Operating Systems	70.87	70.82	57.58	52.91	39.77	53.14	39.57	33.27	49.70	35.58	58.32	51.34	51.34
10	150314: Design & Analysis of Algorithms	61.81	53.04	45.03	51.41	65.17	26.33	45.51	43.96	45.25	39.13	35.77	53.23	53.23
11	250303: Operating Systems	57.31	62.31	53.22	58.03	44.69	35.56	42.45	39.23	57.56	54.13	55.56	54.34	54.34
12	250302: Design & Analysis of Algorithms	58.42	53.04	45.03	51.41	65.17	26.33	45.51	43.96	45.25	39.13	35.77	53.23	53.23
13	250301: Graphs structure	63.66	37.79	41.35	41.47	48.20	35.88	45.32	48.20	51.71	59.45	42.78	57.78	57.78
14	150211: Computer Graphics-LAB	64.05	55.42	35.52	47.04	47.04	43.21	43.34	49.39	55.58	52.77	48.79	54.34	54.34
15	150214: Design & Analysis of Algorithms-LAB	59.69	64.53	50.27	48.76	37.19	37.19	54.12	39.56	49.72	16.24	42.95	53.56	53.56
16	250303: Digital Circuit Design Lab	70.82	51.69	45.20	58.60	31.00	28.88	54.09	37.35	50.61	58.47	42.15	59.66	59.66
17	250321: Design & Analysis of Algorithms-LAB	63.47	58.60	39.17	47.42	47.42	31.00	53.46	38.20	57.05	55.37	57.21	59.30	59.30
18	Computer Networks-150411	52.12	51.80	42.74	40.20	45.48	33.42	53.46	38.20	57.05	55.37	57.21	59.30	59.30
19	Database Management System-150412	71.34	55.69	54.27	48.21	37.65	62.24	57.79	68.49	55.65	55.35	55.39	52.31	52.31
20	Software Engineering-150413	72.32	58.08	45.34	48.29	65.93	36.45	59.60	41.70	59.02	55.35	55.16	58.18	58.18
21	Theory of Computation-150414	64.28	60.32	40.25	42.11	48.09	28.97	54.21	36.19	52.27	48.13	42.33	60.33	60.33
22	Computer Networks-250402	63.74	60.58	43.26	53.27	38.56	31.30	58.55	39.14	56.22	57.07	45.86	58.18	58.18
23	Database Management System-250402	81.41	42.89	54.95	49.90	54.74	27.36	36.60	41.91	56.52	53.76	59.61	43.48	43.48
24	Software Engineering-250403	71.69	54.07	46.05	50.01	54.88	25.21	24.58	31.47	40.41	42.92	44.14	63.51	63.51
25	Theory of Computation-250404	70.97	65.57	43.44	59.29	61.51	31.79	52.80	32.35	46.54	39.47	48.16	57.74	57.74
26	Web Technology-250401	76.29	60.18	43.54	54.44	28.52	32.43	61.12	40.65	54.77	40.65	47.38	53.56	53.56
27	150511: Data Science	68.87	58.77	39.17	46.57	68.40	28.45	53.75	29.12	42.38	39.27	41.27	54.71	54.71
28	150512: Networking with TCP/IP	68.42	55.92	56.36	51.83	35.53	47.47	24.03	24.11	31.79	23.53	48.49	43.54	43.54
29	150513: Information Security	65.74	65.30	41.04	48.49	48.93	29.41	24.57	28.50	53.31	24.57	42.87	57.74	57.74
30	150514: Computer Design	74.21	70.80	57.25	70.36	64.57	44.07	26.91	36.93	48.29	50.47	31.54	53.24	53.24
31	150515: Artificial Intelligence	72.94	72.94	53.82	54.81	42.62	29.06	23.05	32.54	48.23	35.28	43.43	53.16	53.16
32	Cloud Computing & Virtualization-150611	65.67	55.09	52.14	56.59	55.06	23.78	23.55	27.82	34.14	33.20	33.20	55.27	55.27
33	Digital Image Processing-150612	57.11	55.93	33.82	47.01	55.06	66.71	68.70	41.35	43.73	71.22	36.76	45.71	45.71
34	Machine Learning-150613	56.60	82.60	55.20	55.20	82.60	27.60	27.60	82.60	55.20	27.60	55.20	42.56	42.56
35	150711: Awareness with TCP/IP	64.52	64.47	39.97	49.00	46.73	29.03	24.42	28.08	51.35	24.31	42.43	58.41	58.41
36	150712: Data Mining & Warehousing	69.32	59.32	43.46	51.89	51.75	31.32	26.07	30.33	56.42	34.33	45.74	63.54	63.54
37	150608: Intellectual Property Rights	69.36	55.03	54.32	59.47	56.43	24.77	24.30	29.52	34.58	34.09	34.58	49.48	49.48
38	Internship Project	69.42	78.07	51.16	55.13	74.34	27.41	39.63	57.27	40.48	53.22	35.13	73.73	73.73
39	150406: Data Structures Lab	76.16	66.96	49.12	64.43	50.38	35.63	27.07	39.39	37.77	52.58	44.32	58.23	58.23
40	Computer Graphics Lab-150224	54.14	67.53	39.00	69.50	26.94	80.17	36.12	60.45	71.56	11.96	73.43	51.48	51.48
41	Data Structures Lab-250221	75.76	66.56	48.60	64.36	50.10	35.95	55.32	39.02	37.49	50.10	42.37	60.54	60.54
42	Python Programming Lab-250222	70.06	61.70	45.37	53.48	47.34	32.71	24.78	35.97	53.50	47.34	43.87	53.44	53.44





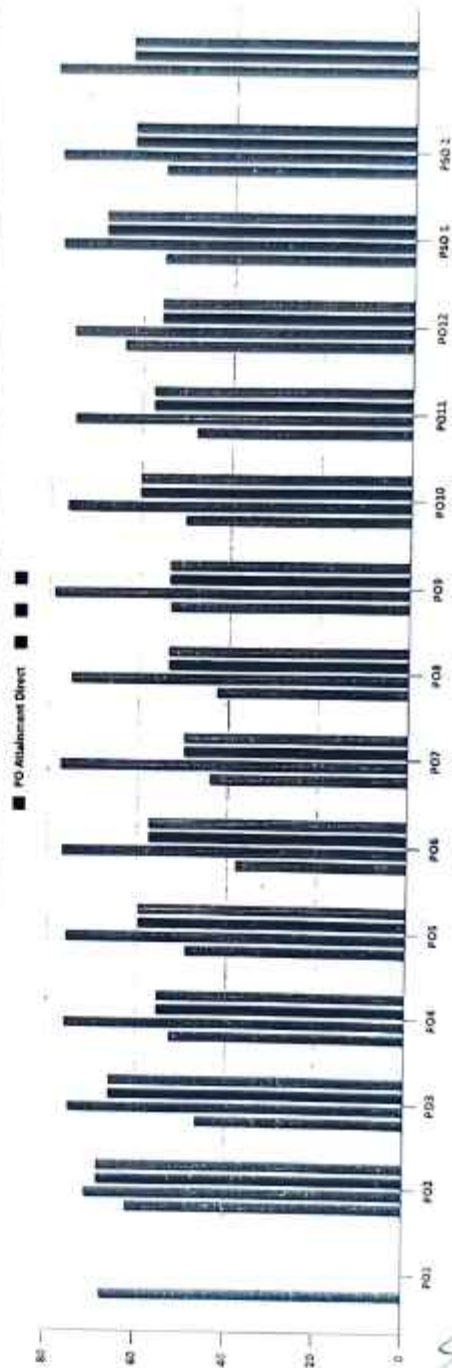


43	Python Programming Lab-150222	68.10	61.08	44.72	55.71	36.50	32.80	24.87	36.05	52.85	47.34	42.10	37.87	33.46	64.25
44	150314-Design & Analysis of Algorithms-LAB	59.69	64.53	50.27	49.78	48.67	43.21	43.34	49.39	55.68	52.77	48.79	43.76	54.04	59.27
45	Computer Networks Lab-150411	67.61	57.12	46.46	44.02	48.67	36.51	57.84	36.92	61.87	48.67	61.80	62.49	61.93	52.42
46	Database Management System Lab-150412	60.47	54.70	56.50	45.89	27.48	64.38	54.45	60.08	55.73	27.74	55.30	53.21	48.14	27.46
47	Web Technology Lab-290401	72.65	65.79	45.91	44.19	39.67	61.00	40.24	59.34	60.41	65.58	56.18	60.69	60.92	66.03
48	150516-Minor Project	65.53	65.23	45.37	40.76	56.18	35.52	57.15	49.62	80.41	65.58	56.18	60.69	60.92	66.03
49	150701-Departmental Lab	62.45	62.44	43.08	40.56	56.18	31.77	53.18	48.71	57.61	63.53	54.22	58.03	57.88	57.83
50	150703-Creative Problem Solving	72.47	72.54	49.74	47.93	66.76	39.02	61.00	56.39	66.98	74.41	63.18	66.89	66.50	58.91

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Department : Computer Science & Engineering Year 2022-2023

Column1	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
PO Attainment Direct	67.52	62.08	46.92	52.94	49.44	38.28	44.49	42.79	53.44	50.26	48.06	64.18	55.65	55.61
PO Attainment Indirect	71.27	75.21	76.06	75.77	76.90	77.46	75.21	79.15	76.34	74.93	75.21	77.75	78.03	79.44
PO Attainment	68.64	66.02	55.66	59.79	57.68	50.03	53.70	53.70	60.31	57.66	56.21	68.25	62.37	62.76



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DEPARTMENT OF CSE

Summary of Program Outcomes (2019-23 Batch)

Targets (%)	SS	PO Attainment (%)	Attained/ Not Attained	Action taken for not attained
PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	55	58.68	Attained	
PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	66.02	66.02	Attained	
PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	55.66	55.66	Attained	
PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	59.79	59.79	Attained	
PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	57.68	57.68	Attained	
PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	50.03	50.03	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: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for, sustainable development.	53.70	53.70	Not Attained	Additional interactive session were arranged for students in courses like IPR and Disaster management.
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	53.70	53.70	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
PO9: Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	60.31	60.31	Attained	
PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	57.66	57.66	Attained	
PO11: Project management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	56.21	56.21	Attained	
PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	68.25	68.25	Attained	
PSO1: Graduate will be able to exhibit analytical & logical skills and apply knowledge of Computer Science to design, develop, test and maintenance of software solutions.	62.37	62.37	Attained	
PSO2: Graduate will be able to identify, formulate and resolve real life/social problems by using current computer technology.	64.76	64.76	Attained	

BH

Student Curriculum Feedback - CSE 3rd Semester

Course Name & Code: Operating Systems_2150302

No. of Responses: 65

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	17.65	35.29	47.06	85.88
The syllabus units are balanced	0	0	17.65	35.29	47.06	85.88
The learning material was available to you	0	0	11.76	2.41	58.82	67.8
The content was clear and easy to understand	0	0	17.69	35.29	47.06	85.91
The course was relevant and updated for present needs	0	0	11.76	52.94	35.29	84.7
The course meets your career expectations	0	0	11.76	47.06	41.18	85.88
The course will be useful to meet your higher studies/future aspirations.	5.86	0	11.76	47.06	35.29	81.17

Course Name & Code: Design and Analysis of Algorithms_2150303

No. of Responses: 65

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	1.54	4.62	24.62	23.08	46.15	81.54
The syllabus units are balanced	1.54	6.15	24.62	24.62	43.08	80.52
The learning material was available to you	1.54	6.15	23.08	18.46	50.77	82.15
The content was clear and easy to understand	1.54	7.69	20	21.54	49.23	81.85
The course was relevant and updated for present needs	3.08	3.08	21.54	26.15	46.15	81.84
The course meets your career expectations	1.54	3.08	18.46	26.15	50.77	81.84

Dr. Manish Dixi
Professor
Department of CS
M.I.T.S. Gwalior

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

The course will be useful to meet your higher studies/future aspirations.	1.54	1.54	18.46	30.77	47.69	84.31
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Course Name & Code: Database Management System_2150304

No. of Responses: 43

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	2.33	11.63	30.23	55.81	87.9
The syllabus units are balanced	0	4.65	9.3	34.88	51.16	86.5
The learning material was available to you	0	0	13.95	25.58	60.47	89.3
The content was clear and easy to understand	0	0	11.63	32.56	55.81	88.84
The course was relevant and updated for present needs	0	6.98	13.95	27.91	51.16	84.65
The course meets your career expectations	0	6.98	13.95	27.91	51.16	84.65
The course will be useful to meet your higher studies/future aspirations.	2.33	2.33	13.95	27.91	53.49	85.59

Course Name & Code: Software Engineering_2150305

No. of Responses: 45

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	13.33	33.33	53.33	87.99
The syllabus units are balanced	0	4.44	15.56	35.56	44.44	84
The learning material was available to you	0	2.22	15.56	26.67	55.56	87.12
The content was clear and easy to understand	0	4.44	11.11	35.56	48.88	85.77

Manish Dixi
Professor
Department of CSE
M.I.T.S. Gwalior

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

The course was relevant and updated for present needs	0	2.22	17.78	33.33	46.67	84.89
The course meets your career expectations	0	0	22.22	26.67	51.11	85.78
The course will be useful to meet your higher studies/future aspirations.	0	2.22	20	28.89	48.89	84.89

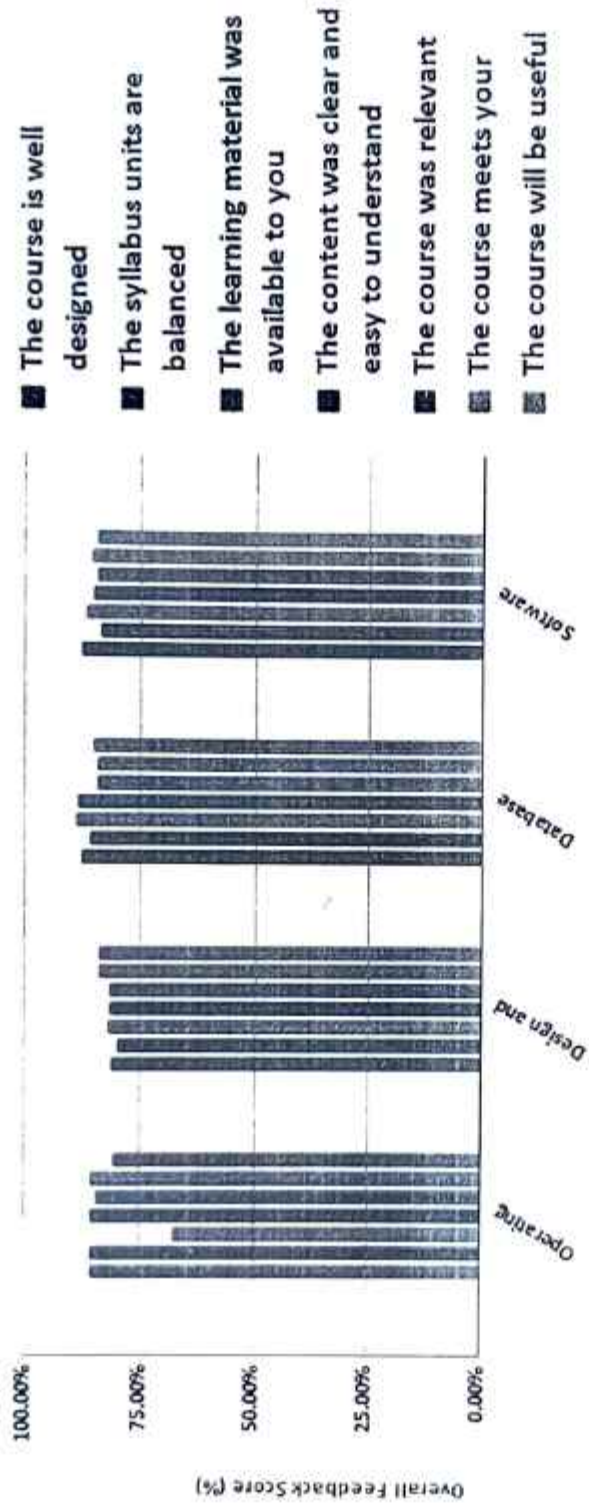
Course Name & Code: Project Management and Financing_1000005_cse

No. of Responses: 28

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	3.57	14.29	14.29	21.43	46.43	78.58
The syllabus units are balanced	3.57	17.86	14.29	25	39.29	75.72
The learning material was available to you	7.14	14.29	10.71	25	42.86	76.43
The content was clear and easy to understand	3.57	17.86	10.71	21.43	46.43	77.86
The course was relevant and updated for present needs	7.14	10.71	17.86	25	39.29	75.72
The course meets your career expectations	3.57	14.29	14.29	21.43	46.43	78.58
The course will be useful to meet your higher studies/future aspirations.	3.57	10.71	17.86	28.57	39.29	77.86


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

Overall Student Curriculum Feedback Analysis - CSE Third Semester



Dr. Manish Dixit
 Professor &
 Department of
 C.S.E., G4

Feedback Analysis (July. - Dec 2023)

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:	Suggestion for Open electives:
1	Operating Systems_2150302	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments
2	Design And Analysis Of Algorithms_2150303	Not Required All The Topic In Course Are Sufficient And Important.	Data Security .. SQL	Data Model Ethical Hacking And Cyber Security	Fuzzy	None	None	None
3	Database Management System_2150304	No Comments	Data Security	Data Model Ethical Hacking And Cyber Security	No Comments	No Comments	No Comments	No Comments

Dr. M.B. The Students.
The Suggestive List
Department
M.I.T.S.

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

									Of Honour, Minor And Elective Courses Will Be Forwarded And Presented In Upcoming Bos For Necessary Actions
4	Software Engineering_2150305	Waterfall Model	New Security Technology Which Is Widely Used By Top Security Company	Requirement Engineering	No Comment	No Comment	No Comment	No Comment	Syllabus Will Be Discussed In The Upcoming Bos Meeting For The Updates Suggested By The Students. The Suggestive List Of Honour, Minor And Elective Courses Will Be Forwarded And Presented In Upcoming Bos For Necessary Actions.
5	Project Management And Financing_1000005	No Comment	No Comment	No Comment	No Comment	No Comment	No Comment	No Comment	All The Responses Are Satisfactory


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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Student Curriculum Feedback - CSE 5th Semester

Course Name & Code: Data Science_150511

No. of Responses: 104

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	3.85	13.86	30.77	51.92	86.39
The syllabus units are balanced	1.92	3.85	14.42	29.81	50	84.42
The learning material was available to you	1.92	4.81	13.46	25.96	53.85	85
The content was clear and easy to understand	1.92	3.85	14.42	31.73	48.08	84.04
The course was relevant and updated for present needs	0.96	3.85	14.42	31.73	49.04	84.81
The course meets your career expectations	0.96	2.88	20.19	27.88	48.08	83.84
The course will be useful to meet your higher studies/future aspirations.	0.96	3.85	16.35	30.77	48.08	84.24

Course Name & Code: Networking with TCP/IP_150512

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	0	0	16.67	29.17	54.17	87.51
The syllabus units are balanced	0	0	12.5	20.83	66.67	90.83
The learning material was available to you	0	0	16.67	12.5	70.83	90.83
The content was clear and easy to understand	0	0	12.5	25	62.5	90
The course was relevant and updated for present needs	0	0	16.67	16.67	66.67	90.01
The course meets your career expectations	0	0	16.67	16.67	66.67	90.01
The course will be useful to meet your higher studies/future aspirations.	0	0	16.67	20.83	62.5	89.17

Dr. Manish
Professor

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Course Name & Code: Information Security_150513
No. of Responses: 30

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	7.69	0	7.69	38.46	46.15	83.07
The syllabus units are balanced	7.69	0	7.69	46.15	38.46	81.53
The learning material was available to you	7.69	0	23.08	38.46	30.77	76.92
The content was clear and easy to understand	15.38	0	7.69	46.15	30.77	75.38
The course was relevant and updated for present needs	7.69	7.69	7.69	30.77	46.15	79.99
The course meets your career expectations	7.69	7.69	7.69	38.46	38.46	78.46
The course will be useful to meet your higher studies/future aspirations.	15.38	7.69	7.69	30.77	38.46	73.84

Course Name & Code :Compiler Design_150514
No. of Responses: 21

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	4.76	38.1	57.14	90.48
The syllabus units are balanced	0	0	4.76	38.1	57.14	90.48
The learning material was available to you	0	4.76	4.76	23.81	66.67	90.48
The content was clear and easy to understand	0	0	4.76	28.57	66.67	92.38
The course was relevant and updated for present needs	0	4.76	4.76	33.33	57.14	88.56
The course meets your career expectations	0	4.76	0	33.33	61.9	90.47
The course will be useful to meet your higher studies/future aspirations.	0	4.76	4.76	23.81	66.67	90.48

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Course Name & Code : Artificial Intelligence_150515

No. of Responses: 11

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	18.18	9.09	54.55	18.18	74.55
The syllabus units are balanced	0	18.18	18.18	36.36	27.27	74.54
The learning material was available to you	0	18.18	9.09	45.45	27.27	76.36
The content was clear and easy to understand	0	18.18	0	54.55	27.27	78.18
The course was relevant and updated for present needs	0	18.18	18.18	36.36	27.27	74.54
The course meets your career expectations	0	18.18	0	54.55	27.27	78.18
The course will be useful to meet your higher studies/future aspirations.	0	18.18	9.09	36.36	36.36	78.17

Course Name & Code: Disaster Management_1000006

No. of Responses: 22

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	9.09	9.09	50	31.82	80.91
The syllabus units are balanced	0	9.09	18.18	36.36	36.36	79.99
The learning material was available to you	4.54	4.54	13.64	31.82	45.45	81.81
The content was clear and easy to understand	4.54	4.54	13.64	45.45	31.82	79.09
The course was relevant and updated for present needs	0	13.64	13.64	36.36	36.36	79.09
The course meets your career expectations	4.54	0	22.72	36.36	36.36	79.99
The course will be useful to meet your higher studies/future aspirations.	0	9.09	9.09	50	31.82	80.91

Prof. Dr. M. R. Jaiswal
Prof. Dr. M. R. Jaiswal
Prof. Dr. M. R. Jaiswal
Prof. Dr. M. R. Jaiswal
Prof. Dr. M. R. Jaiswal

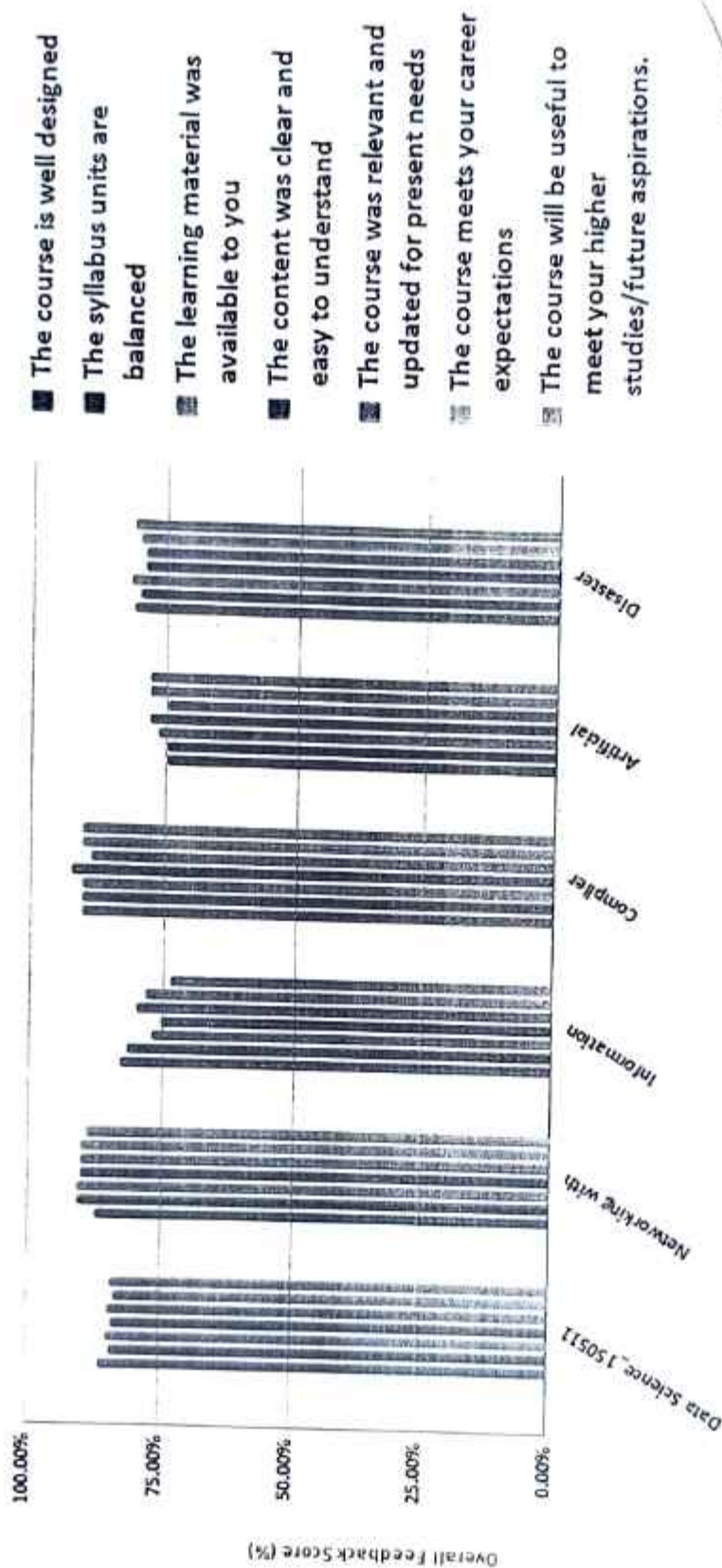
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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Overall Student Curriculum Feedback Analysis - CSE Fifth Semester



Dr. Manish
Professor
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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

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:	Suggestion for Open electives:	Action Taken
1	Data Science_150511	none	none	none	DATA SCIENCE Cyber security Ethical hacking	MACHINE LEARNING	Software Engineering	Ethical hacking	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.
2	Networking with TCP/IP_150512	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	All the responses are Satisfactory.
3	Information Security_150513	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	All the responses are Satisfactory.
4	Compiler Design_150514	No Comment	Want To Update About The Implementation	No Comment	No Comment	No Comment	No Comment	No Comment	Syllabus will be discussed in the upcoming BOS meeting for the updates suggested by the students.
5	Artificial Intelligence_150515	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	All the responses are Satisfactory.
6	Disaster	no comments	no comments	no comments	Cybersecurity	no comments	no comments	no comments	The 'suggestion' is 'satisfactory'.

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

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Dr. Mani
Professor
Department

Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Student Curriculum Feedback - CSE 7th Semester

Course Name & Code: Data Mining and Warehousing_DE-2 - 150715

No. of Responses: 5

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	0	80	20	84
The syllabus units are balanced	0	0	0	80	20	84
The learning material was available to you	0	0	0	60	40	88
The content was clear and easy to understand	0	0	0	80	20	84
The course was relevant and updated for present needs	0	0	20	60	20	80
The course meets your career expectations	0	0	0	80	20	84
The course will be useful to meet your higher studies/future aspirations.	0	0	0	80	20	84

Course Name & Code: Distributed Systems_DE-2 - 150716

No. of Responses: 20

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	35	30	35	80
The syllabus units are balanced	0	0	50	15	35	77
The learning material was available to you	5	0	25	45	25	77
The content was clear and easy to understand	0	5	15	50	30	81
The course was relevant and updated for present needs	0	0	25	50	25	80
The course meets your career expectations	0	0	30	45	25	79
The course will be useful to meet your higher studies/future aspirations.	0	0	30	45	15	69

69.5

Feedback Analysis (July. - Dec 2023)

Course Name & Code: Network Security_OC-2 - 910201

No. of Responses: 37

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	8.11	10.81	29.73	8.11	43.24	73.51
The syllabus units are balanced	2.7	13.51	24.32	24.32	35.14	75.13
The learning material was available to you	10.81	10.81	27.03	10.81	40.54	71.89
The content was clear and easy to understand	2.7	16.22	16.22	21.62	43.24	77.3
The course was relevant and updated for present needs	5.41	10.81	29.73	5.41	48.55	76.22
The course meets your career expectations	10.81	13.51	16.22	21.62	37.84	72.43
The course will be useful to meet your higher studies/future aspirations.	2.7	10.81	27.03	18.92	40.54	76.76

Course Name & Code: Computer Networks_OC-2 - 910202

No. of Responses: 25

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	28	28	44	83.2
The syllabus units are balanced	0	4	28	28	40	80.8
The learning material was available to you	0	4	28	20	48	82.4
The content was clear and easy to understand	0	4	28	24	44	81.6
The course was relevant and updated for present needs	4	0	20	32	44	82.4
The course meets your career expectations	0	0	28	28	44	83.2
The course will be useful to meet your higher studies/future aspirations.	0	0	24	32	44	84.8

Feedback Analysis (July. - Dec 2023)

Course Name & Code: Universal Human Values and Professional Ethics_10000008
No. of Responses: 10

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	10	0	10	50	30	78
The syllabus units are balanced	10	0	10	40	40	80
The learning material was available to you	10	0	10	50	30	78
The content was clear and easy to understand	10	0	10	50	30	78
The course was relevant and updated for present needs	10	0	0	50	40	82
The course meets your career expectations	10	0	0	60	30	80
The course will be useful to meet your higher studies/future aspirations.	10	0	0	60	30	80

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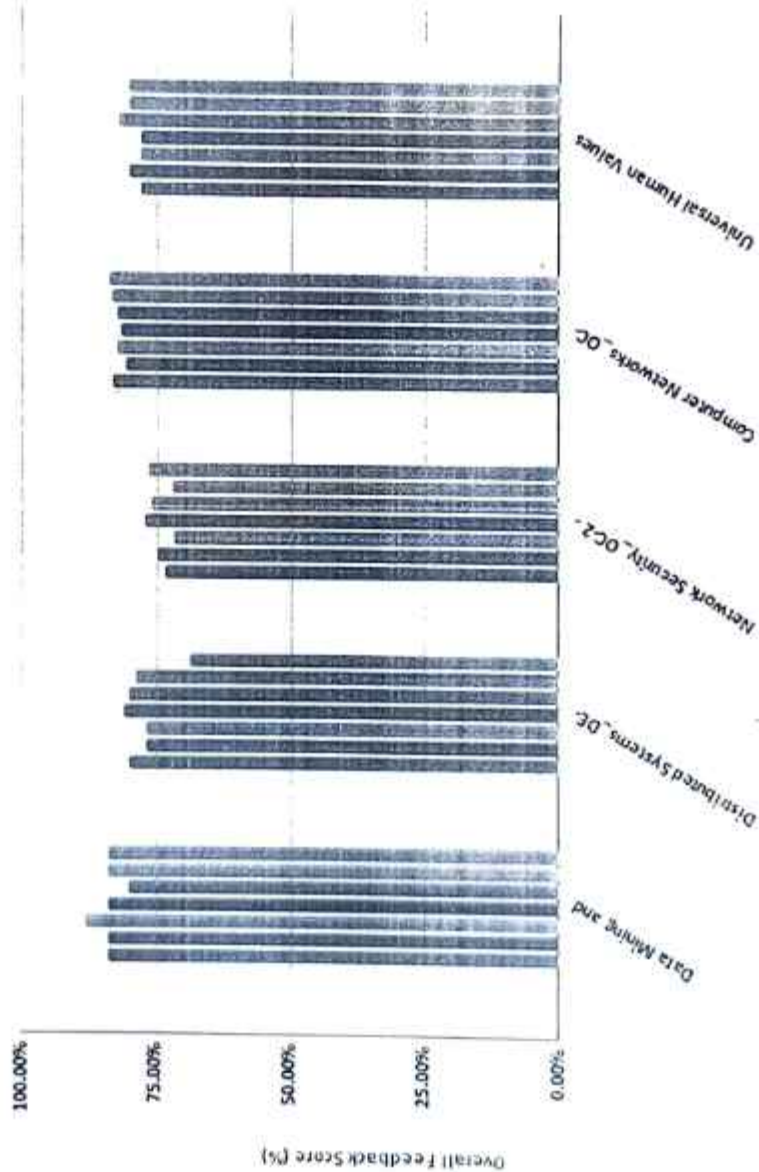
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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Overall Student Curriculum Feedback Analysis - CSE Seven Semester



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

Dr. Manish K. Singh
Professor
Department of
CSE

Feedback Analysis (July. - Dec 2023)

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:	Suggestion for Open electives:
1	Data Mining and Warehousing_DE-2 - 150715	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments
2	Distributed Systems_DE-2 - 150716	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments
3	Network Security_OC-2 - 910201	No Comments	python	No Comments	No Comments	No Comments	No Comments	No Comments

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.

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

4	Computer Networks_OC-2 - 910202	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	No Comments	All the responses are Satisfactory
5	Universal Human Values and Professional Ethics_1000008	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	NO COMMENT	All the responses are Satisfactory

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Department of Computer Science and Engineering

Feedback Analysis (July - Dec 2023)

Student CO Feedback - CSE 3rd Semester

Course Name & Code: Operating Systems_2150302

No. of Responses: 14

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
Outline the basic concept of operating systems	71.43	28.57	0	90.48
Analyze the working of operating system	64.29	28.57	7.14	85.72
Examine the working of various scheduling/allocation approaches	78.57	21.43	0	92.86
Measure the performance of various scheduling/allocation approaches	57.14	42.86	0	85.71
Analyze the various operating system problems/issues	64.29	35.71	7.14	90.48
Develop the Solution of various operating system problems/issues	57.17	35.71	7.14	83.36

Course Name & Code: Design and Analysis of Algorithms_2150303

No. of Responses: 65

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to tell the basic features of Algorithms.	58.46	36.92	4.62	84.61
I am able to outline major Algorithms and Data Structures.	50.77	43.08	6.15	81.54
I am able to apply various algorithmic design paradigms.	47.69	44.62	7.69	80
I am able to analyze the asymptotic performance of Algorithms.	49.23	44.62	6.15	81.03
I am able to compare different design techniques to develop algorithms for computational problems.	47.69	43.08	9.23	79.49
I am able to design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach.	55.38	40	4.62	83.59

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Feedback Analysis (July. - Dec 2023)

Course Name & Code: Database Management System_2150304

No. of Responses: 44

Parameters(COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Define the terminology, features, classifications, and characteristics embodied in database systems.	65.91	31.82	2.27	87.88
I am able to Identify different issues involved in the design and implementation of database system.	72.73	25	2.27	90.15
I am able to Analyse database schema for a given problem domain.	70.45	25	4.55	88.63
I am able to Justify principles for logical design of databases, including the E-R modeling and Normalization approach.	75	22.73	2.27	90.91
I am able to Apply transaction processing concepts and recovery methods over real time data.	63.64	31.82	4.55	86.37
I am able to Formulate, using relational algebra and SQL, solutions to a broad range of query Problems.	68.18	31.82	0	89.39

Course Name & Code: Software Engineering_2150305

No. of Responses: 45

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Explain the various fundamental concepts of software engineering.	50	42.86	7.14	80.95
I am able to Develop the concepts related to software design & analysis.	46.43	50	3.57	80.95
I am able to Compare the techniques for software project management & estimation.	46.43	46.43	7.14	79.76
I am able to Choose the appropriate model for real life software project.	53.57	42.86	3.57	83.33
I am able to Design the software using modern tools and technologies.	50	41.07	8.93	80.36
I am able to Test the software through different approaches.	50	42.86	7.14	80.95

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Student CO Feedback - CSE 5th Semester

Course Name & Code: Data Science_150511
No. of Responses: 119

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
After completing the course, the student will be able to Define basic concepts of Data Sciences.	47.9	45.38	6.72	80.39
After completing the course, the student will be able to Illustrate various concepts of python that are used in data sciences.	45.38	47.06	7.56	79.27
After completing the course, the student will be able to Identify various methods for the representation and manipulation of vectors.	47.9	47.06	5.04	80.95
After completing the course, the student will be able to Analysis the data for applying various statistical modelling approaches.	50.42	43.7	5.86	81.51
After completing the course, the student will be able to Identify hidden patterns in data and transform it using data science techniques.	44.54	50.42	5.02	79.83
After completing the course, the student will be able to CO6: Apply regression techniques to solve real world problems.	44.54	50.42	5.04	79.83

Course Name & Code: Networking with TCP/IP_150512
No. of Responses: 24

Parameters(COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Outline of the basic functionality of TCP/IP layers	70.83	29.17	0	90.28
I am able to Analyze various addressing mechanism used in the internet	70.83	29.17	0	90.28
I am able to Elaborate the framing, Routing and Address translation mechanism used in the internet	79.17	20.83	0	93.06
I am able to Analyze the working of Application layer protocols	70.83	29.17	0	90.28

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Department of Computer Science and Engineering

Feedback Analysis (July. - Dec 2023)

Course Name & Code: Artificial Intelligence_150515

No. of Responses: 17

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Understand concepts & applications of Artificial Intelligence and different types of intelligent agents.	64.71	29.41	5.88	86.28
I am able to Formulate problems as state space search problem & efficiently solve them.	64.71	23.53	11.76	84.32
I am able to Understand the working of various informed, uninformed and heuristics searching algorithms.	64.71	29.41	5.88	86.28
I am able to Understand the concept of knowledge representation techniques.	70.59	17.65	11.76	86.28
I am able to Evaluate the various learning algorithms for solving problems.	64.71	29.41	5.88	86.28

Course Name & Code: Artificial Intelligence_150515

No. of Responses: 11

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to Understand concepts & applications of Artificial Intelligence and different types of intelligent agents.	45.45	36.36	18.18	75.75
I am able to Formulate problems as state space search problem & efficiently solve them.	45.45	36.36	18.18	75.75
I am able to Understand the working of various informed, uninformed and heuristics searching algorithms.	36.36	45.45	18.18	72.72
I am able to Understand the concept of knowledge representation techniques.	45.45	36.36	18.18	75.75
I am able to Evaluate the various learning algorithms for solving problems.	45.45	36.36	18.18	75.75

Prof. Dr. P. S. Mishra

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

Feedback Analysis (July. - Dec 2023)

Course Name & Code: Disaster Management_10000006

No. of Responses: 24

Parameters(COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
Identify disaster prevention and mitigation approaches	50	41.67	8.33	80.56
Classify global and national disasters, their trends and profiles	50	45.83	4.17	81.94
Determine the impacts of various disasters	54.17	37.5	8.33	81.95
Apply Disaster Risk Reduction in management	54.17	41.67	4.17	83.34
Infer the linkage between disasters, environment and development	50	41.67	8.33	80.56

Prof. Dr. S. S. G. G.
Department of
Computer Science & Engineering

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

Feedback Analysis (July. - Dec 2023)

Course Name & Code :Disaster Management_1000006)

No. of Responses: 24

Parameters(COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
Identify disaster prevention and mitigation approaches	63.64	36.36	0	87.88
Classify global and national disasters, their trends and profiles	63.64	36.36	0	87.88
Determine the impacts of various disasters	63.64	36.36	0	87.88
Apply Disaster Risk Reduction in management	63.64	36.36	0	87.88
Infer the linkage between disasters, environment and development	63.64	36.36	0	87.88

Course Name & Code: Data Mining and Warehousing_DE-2 - 150715

No. of Responses: 43

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to explain the basic component and functional units to define computer architecture.	18.6	58.14	23.26	65.11
I am able to Explain different number system and basic operations employed at machine level.	25.58	51.16	23.26	67.44
I am able to develop an understanding of combinational circuits.	30.23	53.49	16.28	71.32
I am able to analyse the basic concept of sequential circuits.	20.93	48.84	30.23	63.57
I am able to compare and differentiate various memories used in Computers.	20.93	58.14	20.93	66.67
I am able to Reduce the Boolean functions to mitigate hardware complexity issues.	27.91	48.84	23.26	68.22

Course Name & Code: Distributed Systems_DE-2 - 150716

No. of Responses: 18

Dr. Pooja
Department of
Computer Science

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

Feedback Analysis (July - Dec 2023)

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	40	55	5	78.33
I am able to Demonstrate knowledge of the core architectural aspects of distributed systems.	33	55	12	73.67
I am able to Identify how the resources in a distributed system are managed by algorithm.	45	55	0	81.67
I am able to Examine the concept of distributed file system and distributed shared memory.	45	55	0	81.67
I am able to Compare various distributed system algorithms for solving real world problems	61	39	0	87
I am able to Develop application for achieving various services of distributed system	50	44	6	81.33

Course Name & Code: Network Security_OC-2 – 910201
No. of Responses: 40

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to define various aspects of network security.	27.5	47.5	25	67.5
I am able to illustrate fundamentals of number theory and cryptography.	32.5	37.5	30	67.5
I am able to apply security mechanisms to achieve principles of network security	22.5	47.5	30	64.17
I am able to analyze the cause for various existing network attacks	27.5	45	27.5	66.67
I am able to examine the vulnerabilities in applications over internet	30	47.5	22.5	69.17
I am able to develop a secure protocol for achieving various network security services.	35	35	30	68.33

Course Name & Code: Computer Networks_OC-2 - 910202)
No. of Responses: 23

Dr. Manish Kumar
Professor of CSE
Department of CSE
M.T.T.S. Gwalior

Madhav Institute of Technology & Science, Gwalior

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

Department of Computer Science and Engineering

Feedback Analysis (July - Dec 2023)

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am able to explain the fundamental concepts of computer network.	39.13	56.52	4.35	78.26
I am able to illustrate the basic taxonomy & terminologies of computer network.	56.52	39.13	4.35	84.06
I am able to identify various parameter for affecting the performance of computer network	52.17	43.48	4.35	82.61
I am able to analyze the concepts of communication using various layer of OSI model.	60.87	34.78	4.35	85.51
I am able to evaluate the performance of computer network in congestion and Internet.	43.87	47.83	4.35	77.21
I am able to design the network environment and applications for implementation of computer networking concept	43.48	52.17	4.35	79.71

Course Name & Code: Universal Human Values and Professional Ethics_1000008

No. of Responses: 10

Parameters (COs)	Strongly Agree (%age Response)	Agree (%age Response)	Average (%age Response)	Overall Score (%)
I am more aware of their surroundings, society, social problems and their sustainable solutions.	70	30	0	90
I become sensitive to their commitment towards what they believe in (humane values, humane relationships and humane society)	70	30	0	90
I am able to apply what I have learnt to their own self in different day-to-day settings in real life.	60	40	0	86.67
I am able to sustain human relationships and human nature in mind	70	30	0	90
I am able to have better critical ability.	70	30	0	90
I am able to negotiate living in harmony with self and other	70	30	0	90

Professor
Department

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE

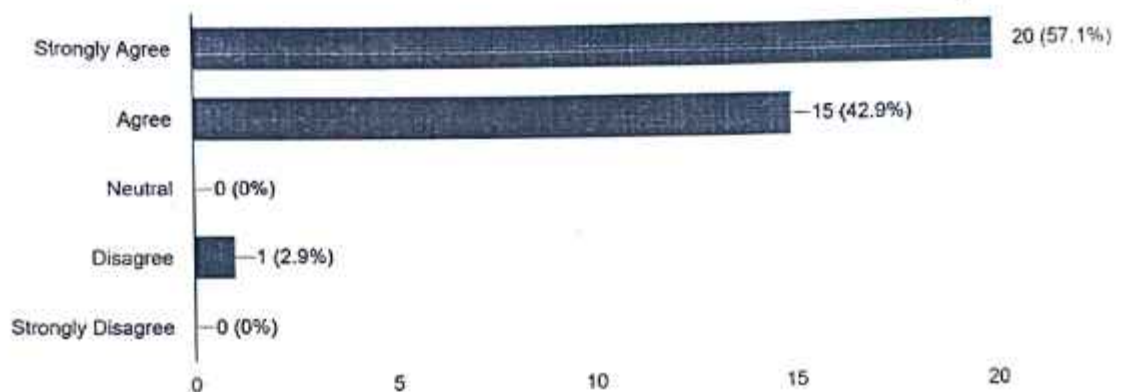
Department of CSE

ALUMNI FEEDBACK ANALYSIS

TOTAL RESPONSES: 35

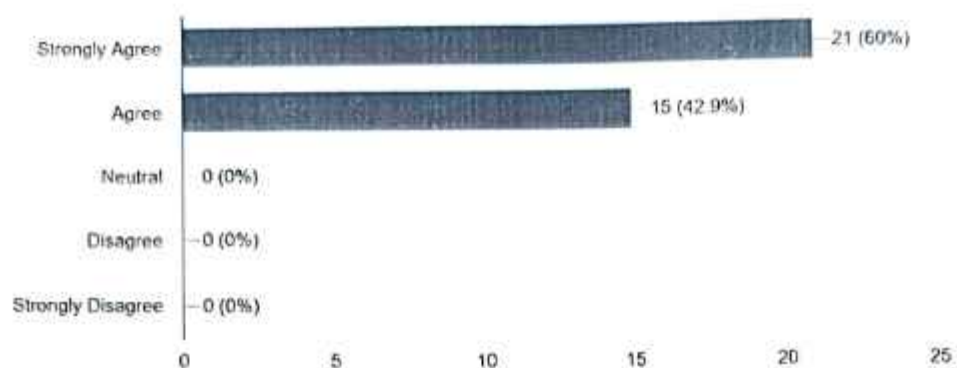
Do you find yourself capable of making a good career ?

35 responses



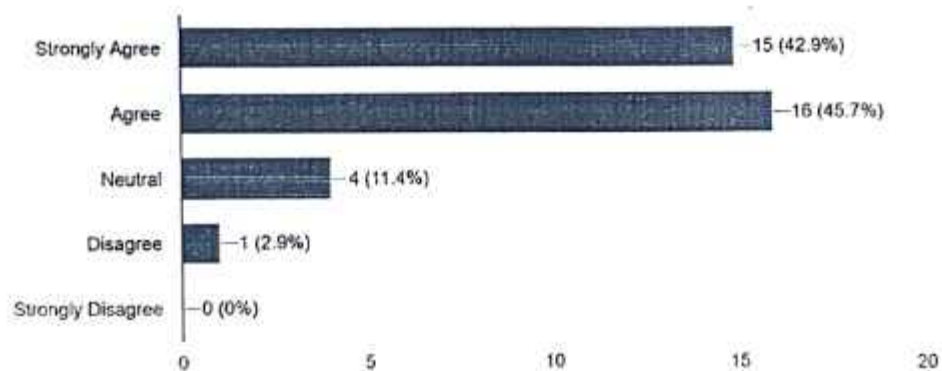
Do you feel that you are capable of learning new things in the constantly changing technological world.

35 responses



Are you able To apply, analyze, design and create products and solutions for real life Engineering problems?

35 responses



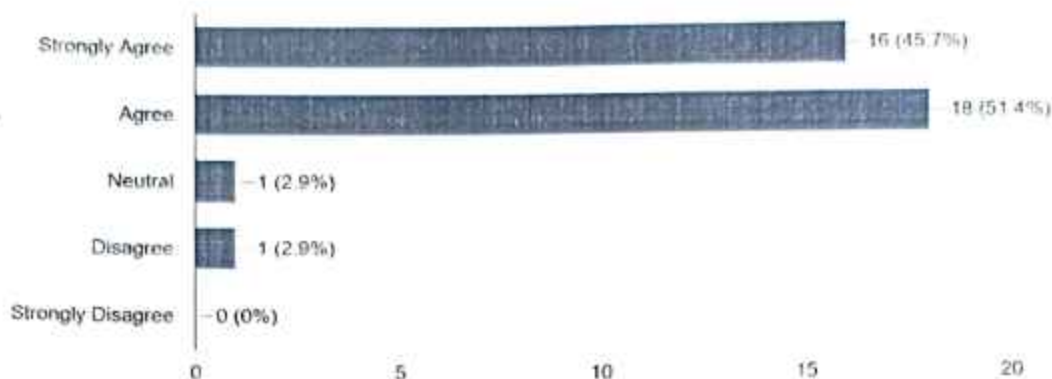
Q

✓

Q

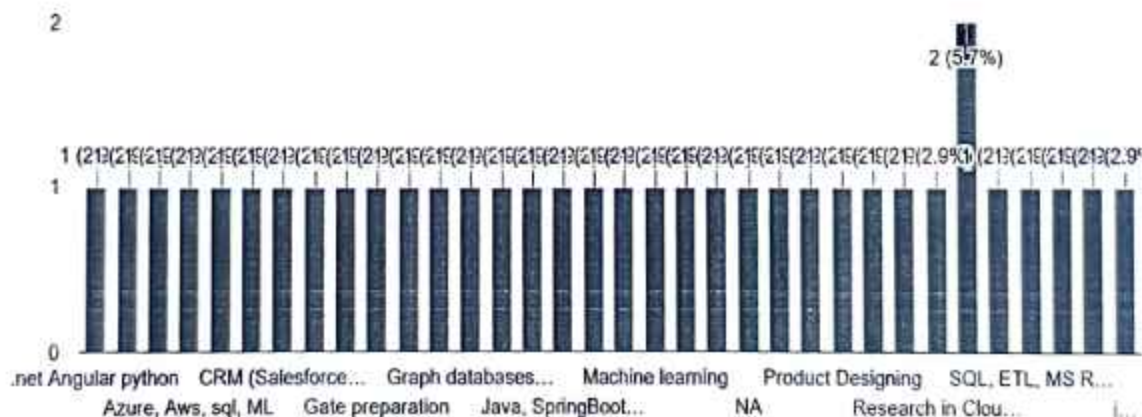
Do you feel that you are able to manage projects in an ethical manner and work efficiently as a member /leader of multidisciplinary teams.

35 responses



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

35 responses



Total Responses: 35

[Handwritten signatures and marks]

Response sheet:

Timestamp	Name	Email ID	Branch	College ID/ Enrollment ID	Do you find yourself capable of making a good career?	Do you feel that you are capable of learning new things in the constantly changing technological world.	Are you able To apply, analyze, design and create products and solutions for real life Engineering problems?	Do you feel that you are able to manage projects in an ethical manner and work efficiently as a member /leader of multidisciplinary teams.	Company/ Organization name & Designation	Please let us know current technologies used in Industries or Technologies in which you are working	Please suggest any courses/ topics that must be included in our curriculum that will help students to bridge the industry-academia gap.
2023/11/03 2:11:33 PM GMT+5:30	Milee	Sharmamil.0899@gmail.com	CSE	0901CS20MT03	Agree	Agree	Agree	Agree	Ministry of rural development	Python	Practical knowledge.
2023/11/03 2:28:01 PM GMT+5:30	Raj Kumar	rajkumar010898@gmail.com	CSE	0901CS171086	Agree	Agree	Agree	Agree	Merkur gaming India private limited	Latest C++ version and lua.	I would be suggest artificial intelligence and use of chat gpt that will more help to increase technical skills.
2023/11/03 2:46:09 PM GMT+5:30	Bhanu Pratap Kansana	bhanu.kansana@gmail.com	CSE	0901CS111016	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Microsoft/ Cyber Security Research	Binary Reverse Engineering	Cyber Attack and File formats
2023/11/03 2:57:37 PM GMT+5:30	Gautam Agrawal	gautam1234agrawal@gmail.com	CSE	0901CS191037	Agree	Agree	Agree	Agree	Accenture	SAP	ML AI
2023/11/03 2:58:53 PM GMT+5:30	Neetesh koli	neeteshkoli70@gmail.com	CSE	0901CS171064	Agree	Strongly Agree	Agree	Agree	Ro platform limited, software developer	Spring boot ,java , C++	New technology

2023/11/03 3:02:08 PM GMT+5:30	Aditya Vaidyan Singh Chohan	adityachohan322@gmail.com	CSE	0901CS191003	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	SAP ENGINEER	SAP HANA AB	Cloud technology and AI
2023/11/03 3:07:52 PM GMT+5:30	Ajay Kumar Gaur	ajaygaur2013@outlook.com	CSE	CE07/06	Agree	Agree	Agree	Agree	Citigroup	net Angular python	Strong Practical knowledge on design framework and any programming language
2023/11/03 3:13:06 PM GMT+5:30	Alok Kumar	kumaraklok5326@gmail.com	CSE	0901cs161008	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Infosys	Artificial intelligence	More framework based tool
2023/11/03 3:13:56 PM GMT+5:30	Sapna kushwah	sapnakushwah142@gmail.com	OTHER		Agree	Agree	Agree	Agree	ABV-ITM Gwalior PHD Scholar	Soft Computing and optimization techniques	Blockchain technologies
2023/11/03 3:18:13 PM GMT+5:30	Adarsh Tripathi	adarshphysics1973@gmail.com	CSE	0901CS191007	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	MTech CSE student in IIIT Bangalore	Machine learning	Machine learning
2023/11/03 3:18:52 PM GMT+5:30	Harsh Kumar Mishra	Harshmishra.cs17@gmail.com	CSE	0901CS203D02	Agree	Agree	Neutral	Agree	Daurala organics (GET IT)	SAP	ERP
2023/11/03 3:24:37 PM GMT+5:30	Nivesh Rajpoot	niveshrajput01@gmail.com	CSE	0901CS191071	Strongly Agree	Strongly Agree	Neutral	Agree	Tata Consultancy Services, System Engineer	Java	Data Structures & Algorithms
2023/11/03 3:29:18 PM GMT+5:30	Yashaswi Saxena	yashaswisaxena16@gmail.com	CSE	0901CS183D25	Agree	Strongly Agree	Agree	Neutral	TCS	Data analytics	Corporate ethics
2023/11/03 3:29:41 PM GMT+5:30	Swapnil Singh	swapppp7singh@gmail.com	CSE	0901CS191060	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Manager at Morgan Stanley	Java, Spring Boot, Microservices, Cloud, Kubernetes	More focus on providing coding trainings in college for freshers would be helpful

2023/11/03 3:41:03 PM GMT+5:30	Himanshi Vardhani	himanshivardhani617@gmail.com	CSE		Strongly Agree	Strongly Agree	Agree	Agree	Accenture Strategy, Management consulting analyst	Gen AI, MS Azure, Cloud, Metaverse	Gen AI
2023/11/03 3:31:30 PM GMT+5:30	Sanskriti Jha	sanskritijha@live.in	CSE	0901CS191108	Agree	Agree	Agree	Agree	CAR Software (Books Software) - Solution Integration Associate	SQL, ETI, MS Report Builder, JIRA, OKTA	Placement Preparation Technical Skills
2023/11/03 4:00:19 PM GMT+5:30	Ankit Raj Singh	ankittrajsingh1792@gmail.com	CSE	0901CS191017	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	FRAMING	Modern Equipment and IoT technology	Nothing
2023/11/03 4:39:41 PM GMT+5:30	Rishabh Saxena	rishabh.saxena2002@gmail.com	CSE	0901CS191086	Agree	Agree	Agree	Strongly Agree	IBM - Application Developer	Package Specialist-Siebel Integration	Devops; Linux; web development
2023/11/03 4:53:25 PM GMT+5:30	Ashish Kumar Upadhyay	ashish.ku12@hotmail.com	CSE	0901CS181020	Agree	Agree	Agree	Agree	M. Tech(CSE) at NIT Trichy	N/A	Big Data analysis
2023/11/03 5:03:57 PM GMT+5:30	Tanupriya Saxena	saxenatanupriya80@gmail.com	CSE	0901CS191130	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	PERSISTENT SYSTEMS, SOFTWARE ENGINEER	Java, SpringBoot, Spring, React, Node, Express, MongoDB, Python	Competitive coding, Web development, Machine Learning all practical learning with hands-on
2023/11/03 5:14:40 PM GMT+5:30	Muralika Bhatia	muralikabhatia25@gmail.com	CSE	0901CS191061	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Cisco, TAC Engineer	Nexus Switches-3k, 5k, 7k, 9k; ISE; Wireless 9800; AireOS; IOS XE; Sherlock; BDB Borg; Catalyst Switches; Meraki; Telepresence	NetAcad(Cisco Networking Academy)
2023/11/03 6:12:22 PM GMT+5:30	Rahul Singh Tomar	sthakur994@gmail.com	CSE	0901CS123D07	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	HCLTech - Senior Consultant	Cypress, Selenium, Test Automation	We can think to train or give some course to the guys on test automation part, as now a days manual testing is reducing and companies are moving forward to automate each and everything to reduce the cost

Q

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												but they are not finding good automation tester
2023/11/03 6:20:00 PM GMT+5:30	Nadeem Ahmad Baba	nadeemhasan586@gmail.com	CSE	0901cs191063	Strongly Agree	Agree	Agree	Agree	Gate preparation	Gate preparation	Gate preparation	
2023/11/03 6:35:19 PM GMT+5:30	Karishma Parashar	karishmaparashar572@gmail.com	CSE	0901CS181053	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Senior software engineer at Tiger analytics company	Graph databases (neo4j/Inphone/trigergraph/stardog)	Problem solving classes	
2023/11/03 7:17:41 PM GMT+5:30	Vinay Gupta	vgmits@gmail.com	CSE		Strongly Agree	Strongly Agree	Neutral	Agree	Amdocs	Bigdata Hadoop	AI, Machine Learning, Cloud	
2023/11/03 7:44:33 PM GMT+5:30	Ruby Prajapati	rubyprajapati632@gmail.com	CSE	0901CS191102	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	IIT Kanpur	ML, Big data, block chain	NA	
2023/11/03 8:27:51 PM GMT+5:30	Arun Kourav	a.arunkaurav1999@gmail.com	CSE	0901cs191022	Disagree	Agree	Neutral/Disagree	Disagree	NA	NA	Logical Programming	
2023/11/03 8:48:12 PM GMT+5:30	Samarth Sharma	bittu.samarth@gmail.com	CSE	0901CS181090	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Falcons, Operations Manager	Product Management and Consulting	Product Management and Finance	
2023/11/03 11:36:18 PM GMT+5:30	Snigdha Jain	snigdha11@gmail.com	CSE	CS11052	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Tata Consultancy Services	Generative AI, Digital Twin, Immersive Technologies such as AR, VR and Metaverse	Regular Industry Academia connect, so that students are aware of whats going on Industry.	
2023/11/04 1:04:44 AM GMT+5:30	abhishek sharma	abhishek230287@gmail.com	CSE		Strongly Agree	Agree	Agree	Agree	DLL finance, CX Manager	CRM (Salesforce), AI Chatbot, Genesys Telephone solutions, MS Excel, Miro Board	Application of AI, Bio-Engineering courses, Material sciences, Hardware repair and recycling	
2023/11/04 1:44:21 PM	Ella Sehgal	ella123sehgal@gmail.com	CSE	Don't recall	Strongly Agree	Strongly Agree	Agree	Strongly Agree	EY	Azure, Aws, sql, ML	Data science, data analytics, machine learning, intelligent	

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GMT+5:30											automation
2023/11/04 10:50:43 PM GMT+5:30	Rohit kushwah	rnhitkushwah111099@gmail.com	CSE	0901CS171092	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Tessell	java, aws, redis, mongodb	The most important thing that I learned during my M.Tech at IIT Kanpur is that the quality of the assignment, so it would be good if the assignments were more challenging and practical
2023/11/06 10:45:48 AM GMT+5:30	PRINCE Kumar	20cs3d09@mitsgwl.ac.in	CSE	0901CS203D09	Agree	Agree	Agree	Agree	Associate Frontend engineer / AngelOne	Product Designing	Please add courses which are more focussed on DSA and System Design. Add more practical Subjects
2023/11/06 12:26:53 PM GMT+5:30	SANDEEP SINGH SIKARWAR	s.sikarwar660@gmail.com, sandeep202149@cuh.sc.in	CSE	0901it143D10	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Central University of Haryana	Research in Cloud Computing	In Cloud Federation
2023/11/06 2:05:00 PM GMT+5:30	ABHINAV CHATURVEDI	ac9514.ac@gmail.com	CSE	0901CS191003	Agree	Agree	Agree	Agree	KLOUDSPOT - SOFTWARE ENGINEER	AI, ML, Python	Web development

Gagandeep Kaur

Dr. Gagandeep Kaur

Department Alumni Coordinator

[Signature]

[Signature]

[Signature]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)
NAAC Accredited with A++ Grade
Computer Science & Engineering Department

Action Taken Report
On
Alumni Satisfaction Survey

The following suggestions were given by the alumni such as:

- Add artificial intelligence and use of chat gpt that will help to increase technical skills.
- ML AI, Data Structures & Algorithms, Big Data analysis are the current Technologies to which students must be aware.
- Students should learn Competitive coding , Web development, Machine Learning all practical learning with hands-on
- Add subjects in the curriculum such as Soft Computing and optimization techniques. Product Management and Cloud Computing

The following actions were taken:

- An **Expert talk** was conducted on Future of artificial intelligence in which use of chat gpt, Tuna, automatic vehicles were discussed with students.
- Courses like ML AI, Data Structures & Algorithms, Big Data analysis are added in curriculum as **DC and NEC courses**
- Students have joined in **NPTEL courses** to learn Competitive coding
- Students have prepared **skill based mini projects and minor projects** on Web development, Machine Learning all practical learning with hands-on
- New Subjects are **added in curriculum** such as Soft Computing and optimization techniques. Project Management and Cloud Computing.

Gagandeep Kaur

Dr. Gagandeep Kaur
Alumni Coordinator
CSE



On Campus Recruitment Feedback Form

Thank you for scheduling the campus recruitment at Madhav Institute of Technology and Science, Gwalior. We have been successful and that we were able to deliver on the recruitment drive.

Please take a few minutes to answer the questions below. This information will provide valuable feedback for our students and staff to better serve your needs in the future.

Name of the interviewer: SANKAR SINGH Designation: HR Manager

Email to: Sankar Singh Mobile: 9898989898 Company: XYZ Corp.

Please tick your response that best describes your experience:

S. No.	Please rate the following points about students and the institute	Excellent	Very Good	Average	Below Average	Comments
1.	Coordination with the Institute T&T team	✓				
2.	Interview format were			✓		
3.	Students' Soft Skills / Communication Skills were			✓		
4.	Students' confidence level and attitude were		✓			
5.	Students' Technical Skills were			✓		
6.	Students' research about the company were			✓		
7.	Students' ability to answer questions		✓			
8.	Students' resumes were		✓			
9.	Students' Projects/Trainings were			✓		
10.	Students' presentation/appearance			✓		
11.	Overall students' preparedness		✓			
12.	Hospitality provided by the Institute was	✓				
13.	Overall experience at the Institute was		✓			

In the space below, please provide areas of improvement, feedback, comments and/or suggestions:

For students:

Required to be more focused on technical skills and Personality development skills.

For the Institute:

Interview Rooms should be good & noise free. Hospitality was excellent.

Thank You for your co-operation in completing the feedback form.

Signature of Interviewer

Signature of Student



Page No. _____ Date _____

The following information is provided by the institution for the purpose of the feedback form.

The following information is provided by the institution for the purpose of the feedback form.

The following information is provided by the institution for the purpose of the feedback form.

Please rate the following points that best describe your experience:

	Please rate the following points about students and the Institute	Excellent	Very Good	Average	Below Average	Comments
1.	Coordination with the Institute T&P team		✓			
2.	Interview rooms were		✓			
3.	Students' Soft Skills / Communication Skills were			✓		
4.	Students' confidence level and attitude were			✓		
5.	Students' Technical Skills were			✓		
6.	Students' research about the company were			✓		
7.	Students' ability to answer questions			✓		
8.	Students' resumes were			✓		
9.	Students' Projects/Trainings were			✓		
10.	Students' presentation/appearance			✓		
11.	Overall students' preparedness			✓		
12.	Hospitality provided by the Institute was		✓			
13.	Overall experience at the Institute was			✓		

In the space below, please provide areas of improvement, feedback, comments and/or suggestions:-

For students:-

I feel they have to improve technical skills, or for interview preparation or problem solving skills.

For the Institute:-

Overall it's good. T&P team and coach members are quite effective.

Thank you for your cooperation in completing the feedback form.



The College Recruitment Committee

The committee is pleased to inform you that the results of the interview and written test have been received. The results are as follows:

The committee has decided to accept the following candidates for the position of Teacher Education. The committee will contact you by email or phone to discuss the details of the position.

Name of the candidate: Mr. [Name] ID: [ID]

Position: Teacher Education Grade: [Grade] Salary: [Salary]

Please fill in the required data for the following points:

No.	Points	Excellent	Very Good	Average	Below Average	Comments
1.	Coordination with the Institute T & P team	✓				
2.	Interview rooms were	✓				
3.	Students' Soft Skills / Communication Skills were	✓				
4.	Students' confidence level and attitude were		✓			
5.	Students' Technical Skills were		✓			
6.	Students' research about the company were		✓			
7.	Students' ability to answer questions		✓			
8.	Students' resumes were		✓			
9.	Students' Projects/Trainings were		✓			
10.	Students' presentation/appearance		✓			
11.	Overall students' preparedness		✓			
12.	Hospitality provided by the Institute was	✓				
13.	Overall experience at the Institute was	✓				

In the space below, please provide areas of improvement, feedback, comments and/or suggestions:-

For students:-

Students are well prepared and confident. A few of them to align their knowledge with what is mentioned in CV.

For the Institute:-

Excellent coordination and hospitality. Thank you.

Thank You for your cooperation in completing the feedback form.

[Signatures]

Q1 Campus Placement Feedback Form

It is our understanding that you are an Institute Graduate or a Graduate of a University or College. We are confident that you are successful and that we will be able to deliver you the best talent we have.

Please take a few minutes to answer the questions below. This information will provide a valuable insight into your strengths and help us to better serve your needs in the future.

Sr. Interviewer: HR: Harshita Sahdev Designation: Sr. University Liaison
Candidate: Harshita Sahdev Mobile: 7009219405 Company: Wipro

Please tick your response that best describe your experience:

Sl. No.	Please rate the following points about students and the institute	Excellent	Very Good	Average	Below Average	Comments
1.	Coordination with the Institute T&P team	✓				
2.	Interview rooms were	✓				
3.	Students' Soft Skills / Communication Skills were			✓		
4.	Students' confidence level and attitude were			✓		
5.	Students' Technical Skills were		✓			
6.	Students' research about the company were		✓			
7.	Students' ability to answer questions		✓			
8.	Students' resumes were		✓			
9.	Students' Projects/Trainings were	✓				
10.	Students' presentation/appearance		✓			
11.	Overall students' preparedness		✓			
12.	Hospitality provided by the institute was	✓				
13.	Overall experience at the institute was		✓			

In the space below, please provide areas of improvement, feedback, comments and/or suggestions:

For students:

Ask More Questions
More Expressible

For the Institute:

Start Soft Skills Training

Thank You for your co-operation in completing the feedback form.

Q1

On-Campus Recruitment Feedback Form

Thank you for attending this On-Campus Recruitment at Wadwa Institute of Technology and Management. We hope you had a good experience and that we were able to deliver you the best of our services.

Please take a few minutes to answer the questions below. This information will provide us with feedback for our future efforts to better serve your needs in the future.

Name of the Interviewer: Rajat Singh Designation: Sr. University Relations
 Email ID: rajat.singh@wadm.ac.in Mobile: 7009214605 Company: Newgen Software

Please tick your response that best describe your experience:

Please rate the following points about students and the Institute	Excellent	Very Good	Average	Below Average	Comments
1. Coordination with the Institute T&P team	☒				
2. Interview rooms were	☒				
3. Students' Soft Skills / Communication Skills were		☒			
4. Students' confidence level and attitude were		☒			
5. Student's Technical Skills were		☒			
6. Students' research about the company were		☒			
7. Students' ability to answer questions		☒			
8. Students' resumes were		☒			
9. Students' Projects/Trainings were	☒				
10. Students' presentation/appearance		☒			
11. Overall students' preparedness		☒			
12. Hospitality provided by the Institute was	☒				
13. Overall experience at the Institute was		☒			

In the space below, please provide areas of improvement, feedback, comments and/or suggestions.

For Students:

Eagerness to ask questions more expressible.

For the Institute:

Start Soft Skill Training

Thank You for your cooperation in completing the feedback form.



Department of Computer Science and Engineering

Action Taken Report on Employer Feedback

S. No.	Employer Name	Feedback/Suggestion for Students	Feedback/Suggestion for the Institute	Action Taken
1	Shikhar Gupta, Newgen Software	Required to be more focused on technical skills and personality development skills.	Interview rooms should be good and noise free. Hospitality was excellent.	Emphasis on Summer Internship program for soft skills training
2.	Mubashshir Shakeel, Learning routes Pvt. Ltd.	Few students to work on soft skills and body language for more confidence.	It was a good experience and looking forward to many more of such.	Emphasis on Summer Internship program for soft skills training
3.	Gopal Kumar, Newgen Software	I feel they have to improve technical skills or for non-technical focus on problem solving skills.	Overall, it's good, T&P team and other members are good and supportive.	Various courses for technical skills and soft skills summer internship Program I and II
4.	Piyush Arora, Newgen Software	Students are well prepared and confident. A few of them to align their knowledge with what is mentioned in CV.	Excellent coordination and hospitality.	All Good
5.	Harshita Sahdev, Newgen Software	Ask more questions, more expressible	Start Soft skill training	Summer Internship program for soft skills training
6.	Rajat Singh, Newgen Software	Eagerness to ask questions, more expressible.	Start Soft skill training	Summer Internship program for soft skills training

(Dr. Manish Dixit)

Professor and Head

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

Master of Technology (Computer Science & Engineering) (S.T. 101) H for batch admitted in academic session 2023-24

Scheme of Examination

S. No.	Subject Code	Subject Name	Maximum Marks Allotted							Contact						
			Theory Slot			Practical Slot		MOOCs		Total Marks	Periods per week					
			End sem	Mid sem	Quiz/ Assignment	End Sem	Lab work/ sessional	Assignment	Exam		L	T	P			
1.	620201	Algorithms Design Techniques and Analysis	70	20	10	-	-	-	-	-	-	-	-	-	-	
2.	620202	Advanced Topics in Data Mining & Warehousing	70	20	10	-	-	-	-	-	-	-	-	-	-	
3.	620203	Image Processing and Retrieval Techniques	70	20	10	-	-	-	-	-	-	-	-	-	-	
4.	101	Departmental Elective-II	-	-	-	-	-	-	-	25	-	75	-	-	-	
5.	101	Open/Category Course (OC-2)	-	-	-	-	-	-	-	25	-	75	-	-	-	
6.	620221	Lab-II	-	-	-	-	90	60	-	-	-	-	-	-	-	
7.	620222	Self Learning Presentation	-	-	-	-	-	100	-	-	-	-	-	-	-	
Total			210	60	30	-	90	160	-	50	-	150	-	15	0	21



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Department of Computer Science and Engineering

ALGORITHMS DESIGN TECHNIQUES AND ANALYSIS

620211/630211

UNIT I

Introduction: Asymptotic Notations and Basic Efficiency Classes, Mathematical Analysis of Recursive and Non-recursive Algorithms, Empirical Analysis of Algorithms, Brute Force and Exhaustive Search- Sequential Search and Brute-Force String Matching, Closest-Pair and Convex-Hull Problems.

UNIT II

Decrease-and-Conquer: Topological Sorting, Fake-Coin Problem, Russian Peasant Multiplication, Josephus Problem, Computing a Median and the Selection Problem, Game of Nim, **Transform-and-Conquer:** 2-3 Trees, Horner's Rule and Binary Exponentiation, Computing the Least Common Multiple, Counting Paths in a Graph.

UNIT III

Space and Time Trade-Offs: Sorting by Counting, Input Enhancement in String Matching, Boyer-Moore Algorithm, Open Hashing (Separate Chaining), Closed Hashing (Open Addressing), B-Trees

UNIT IV

Iterative Improvement: Simplex Method, Maximum-Flow Problem, Maximum Matching in Bipartite Graphs, Stable Marriage Problem. **Limitations of Algorithm Power:** Lower-Bound Arguments, Trivial Lower Bounds, Information-Theoretic Arguments, Adversary Arguments, Problem Reduction, Decision Trees, Decision Trees for Sorting, Decision Trees for Searching a Sorted Array.

UNIT V

Introduction to P, NP, NP-Hard and NP-Complete, P and NP Problems - Partition problem, Bin-packing problem, NP-Complete Problems.

Recommended Books:

1. Introduction to Design and Analysis of Computer Algorithms, 3rd Edition, Anany Levitin, Pearson Education
2. Fundamentals of Computer Algorithms, Horowitz & Sahani, Universities press.
3. Introduction to Algorithms, Cormen Thomas, Leiserson CE, Rivest RL, PHIL
4. Design & Analysis of Computer Algorithms, Ullmann, Pearson.
5. Algorithm Design, Michael T Goodrich, Roberto Tamassia, Wiley India.

COURSE OUTCOMES

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

CO1: outline the basics of algorithms and data structures.

CO2: interpret mathematical foundation in analysis of algorithms.



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- CO3: describe the working of different algorithmic design techniques.
 - CO4: compare the various algorithm design techniques.
 - CO5: select appropriate algorithm design techniques for solving problems.
 - CO6: design algorithms to solve real world engineering problems.
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Department of Computer Science and Engineering

ADVANCED TOPICS IN DATA MINING & WAREHOUSING

620212/630212/640212

UNIT I

Introduction- Motivation, Importance, Functionalities, Basic DM (Data Mining) Vs KDD, DM Applications, Data Warehousing, Evolution of Data Warehousing, Data Warehousing Concepts, Benefits of Data Warehousing, Comparison of OLTP and Data Warehousing, Data Warehousing, Data Warehousing Architecture, Distributed Data Warehouse, Problems of Data Warehousing.

UNIT II

Data Pre-Processing: Data Cleaning, Missing Values, Noisy Data, Data Cleaning, Data Integration and Transformation, Data Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT III

Mining Frequent Patterns, Association, Correlation: Basic Concepts, Efficient Frequent Itemset Mining Method- Apriori Algorithm, Its Variants & other Algorithm for finding Frequent Itemsets using Candidate Generation, Generating Association Rules from Frequent Itemsets, Representative Rules, Improving the Efficiency of Apriori & other Algorithms, Mining Frequent Itemsets without Candidate Generation, Mining Frequent Itemsets using Vertical Data Layout, Maximal Frequent Item Set Mining, Issue Related to the Design of Efficient & Flexible Algorithms.

UNIT IV

Mining Various Kinds of Association Rules, Constraint-Based Association Mining, Classification and Prediction, Cluster Analysis, Graph Mining, Social Network Analysis, Knowledge Discovery through Statistical Techniques, and Knowledge Discovery through Neural Networks, Fuzzy Technology & Genetic Algorithms.

UNIT V

Web Content Mining, Web Structure Mining, Web Usage Mining, Spatial Mining, and Temporal Mining, Social Impacts of Data Mining, Data Mining System Products and Associated Design issues, future trends in Data Mining, Emerging Scenario of Pattern Warehousing System, Case Study -WEKA, SPSS.

Recommended books:

1. Jiwei han and micheline kamer, "data mining: concept and techniques", harcourt india private limited, 2001.
 2. Margaret h. Dunham, "data mining: introductory and Advanced topic" pearson education, 2003.
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COURSE OUTCOMES

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

- CO1: explain the concepts of data warehousing and data mining.
 - CO2: translate the data needed for data mining using pre- processing techniques.
 - CO3: apply appropriate data mining methods like classification, clustering or frequent pattern mining on large data sets.
 - CO4: analyse advanced data mining topics like Web Mining, Spatial and Temporal Mining.
 - CO5: measure the performance of various data mining algorithms.
 - CO6: test real data sets using popular data mining tools such as WEKA, SPSS.
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Department of Computer Science and Engineering

IMAGE PROCESSING AND RETRIEVAL TECHNIQUES

620213/630213

UNIT I

Introduction to Image Processing Systems, Digital Image Fundamentals: - Image model, Relationship between Pixels, Imaging Geometry, Camera Model, Introduction to FT, DFT and FFT, Walsh Transformation, Hadamard Transformation, Histogram.

UNIT II

Image Preprocessing, Images Transformations, Brightness Transformation, Geometric Transformations, Image Smoothing, Neighborhood Averaging, Median Filtering, Low Pass Filters, Average of Multiple Images, Image Sharpening by Differentiation Technique, High Pass Filtering.

UNIT III

Image Restoration:- Degradation Models for Continuous Function, Interactive Diagonalization, on-Degradation, Algebraic approach to Restoration, Effect of Restoration, Gray Level Interpolation, Inverse & Wiener Filter, FIR Wiener Filter, Filtering using Image Transforms.

UNIT IV

Image Encoding, Mapping, Quantizer and Coder, Image Segmentation, Detection of Discontinuation, Point Detection, Line Detection, Edge Detection, Boundary Extraction, Region Representation.

UNIT V

Object Recognition, Pattern Recognition, Knowledge Representation, Statistical Pattern Recognition, Classification Principles, Classifier Learning, Neural Nets, Syntactic Pattern Recognition, Recognition as Graph Matching, Optimization Techniques in Recognition.

Recommended Books:

1. "Digital Image Processing" by Gonzalez & Wood.
 2. "Digital Image Processing" by A. K. Jain.
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COURSE OUTCOMES

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

- CO1: recall the fundamental concepts of a digital image processing system.
 - CO2: categorize various compression techniques.
 - CO3: compare various compression techniques.
 - CO4: evaluate the techniques for image enhancement and image restoration.
 - CO5: interpret image segmentation and representation techniques.
 - CO6: elaborate image segmentation and representation techniques.
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