Student Information Manual SEM II

Student Information Manual (SIM)

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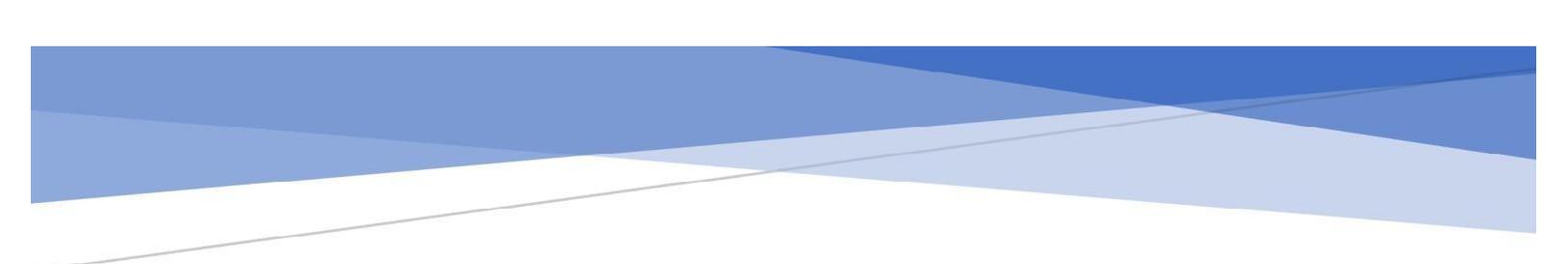**10. Project/Seminar Review Form**
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INSTITUTEINFORMATION

Dr J. J. Magdum College of Engineering was established by Dr J. J. Magdum Trust, Jaysingpur in the year 1992 with an objective to promote the cause of higher education. The institute is approved by All India Council of Technical Education (AICTE), New Delhi and Government of Maharashtra, affiliated to Shivaji University, Kolhapur. The college offers B. Tech program in Mechanical, Civil, Computer Science Engineering, Electronics.

Our Management extends its fullest support in building the institution as a center of excellence with technically superior, ethically strong and competent engineers.

The serene campus vibrant with aesthetic bliss in an exhilarating convenient location, well connected by road, rail and air is easily accessible. The eco-friendly ambience creates and bestows a healthy learning atmosphere.

The institution is meticulous with modern laboratory, workshop facilities and state of art computer center providing an excellent infrastructure.

The institution has spacious library with vast collection of Books, Newspapers, National & International Journals, Magazines, Reference books, Encyclopedia, World of science, ASM hand books and course materials. E-learning through NPTEL Video course by NIT and IIT Professors are available.

The Teaching and Non-Teaching Staff of the institute is a blend of senior experienced and young dynamic faculty members devoted to the noble cause of education. Qualified, experienced, versatile and efficient faculty members mold the students diligently in ethical, moral and academic aspects.

We impart technology based experiential learning through industry visits, live projects, expert talks, MOOC's, workshops, case studies, upscale labs, and virtual classroom sessions.

Industry-Institute interaction and real-time projects nurture and craft the budding engineers to bloom and flourish in the field with the prowess guidance in the campus. The college equips the students with the latest skills which make them employable and future ready.

Due to able and proper guidance and motivation, many of our students have topped at University. Our training and placement work meticulously to improve and develop life skills to the students and tries hard to seek good jobs for our students. In addition to the academics, the students are engaged in sports and cultural activities which helps them to develop versatile personality. Various Club activities are conducted to encourage, motivate and inspire students from diverse culture to harness the talent through their perseverance.

The institute is having specious ground and the modern facilities for both indoor and outdoor games and ultra-modern Gymnasium. Due to proper guidance and motivation, many of our students have grabbed prizes at University level and different sport events.

We are committed to stakeholders for best results and produced more than 10000+ engineers getting campus placements.

VISION OF INSTITUTE

To be a Leading academic organization, creating skilled and Ethical Human Resources by leveraging Technical Education for Sustainable Development of Society.

MISSION OF INSTITUTE

- To produce competent technocrats to meet modern societal and industrial challenges.
- To create ethical and skilled human resources through quality education and various extension activities and outreach programs.
- To leverage technical expertise to solve societal issues for its sustainable development.

VISION OF DEPARTMENT

To be the front runner in the field of computer science and engineering to create skilled, knowledgeable and ethical professionals for development of society.

MISSION OF DEPARTMENT

- To provide quality education with smart tools to face challenges of industry and society.

- To create ethical human resource to provide service to the community.

- To associate with industry for giving opportunities to students to develop their employability and entrepreneur skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO'S)

PEO1. Graduates of the program will apply their foundational engineering knowledge to achieve success in their careers.
PEO2. Graduates of the program will consistently demonstrate core technological expertise in computing throughout their careers
PEO3. Program graduates will fulfill professional requirements, explore higher education prospects, and exhibit understanding of the complexities of self-employment.
PEO4. Graduates of the program will uphold ethical standards, engage in lifelong learning, and remain attentive to societal needs.
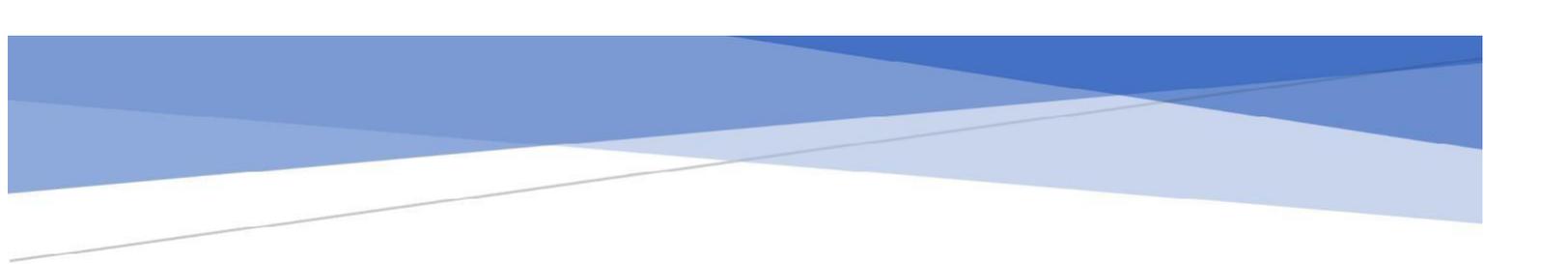
PROGRAMME OUTCOMES (PO'S)

At the end of successful completion of program, the graduates will be able to,

1. **Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

2. **Problem Analysis**: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. **Design/Development of Solutions**: Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental

4. **Conduct investigations** of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid

5. **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 under-standing of the limitations.

6. **The Engineer and Society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering

7. **Environment and Sustainability**: Understand and the impact of professional engineering solutions in societal and environmental contexts and demonstrates knowledge of and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering

9. **Individual and Teamwork**: Function effectively as in visual, and as a member or leader in diverse teams and in multidisciplinary s

10. **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

11. **Project Management and Finance**: Demonstrate knowledge and understanding of engineering and management principles and apply these too noels on work, as a member and leader instead, to manage projects and in multidisciplinary environment.

12. **Lifelong Learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of tech

PROGRAM SPECIFIC OUTCOMES (PSO)

1. Learn and apply latest Software Technologies in the field of Computer Science & Engineering.
2. Identify real time problems and deliver innovative Software solutions for development of society.

STUDENTS ROLES AND RESPONSIBILITIES

CODE-OF-CONDUCT

- ➢ Every student must carry his/her identity card while being present on the College Premises.Use of Cell phones is strictly prohibited during class/Labs hour.
- ➢ Without the permission of the Principal, Students are not allowed to circulate any printed materials within the college campus.
- ➢ Every student is expected to maintain the general cleanliness within the classrooms, laboratories and the campus in general.
- ➢ Students should handle the college properties with care. Damage to the furniture or any other materials may lead to penalty or suspension from the college.
- ➢ Intoxication or possession of narcotics and other dangerous material is strictly prohibited.
- ➢ Playing cards, spitting and loitering are strictly prohibited inside the college campus and shall invitesevere punishment/disciplinary action
- ➢ Attempted or actual theft of and/or damage to property of the College, or property of a member ofthe College community, or other personal or public property, on or off campus will be considered as a punishable act.
- ➢ Every student will remain answerable to the college authority for his/her activity and conduct on the College Premises.
- ➢ Any act which obstructs teaching, research, administrative activity and other proceedings of the college is strictly prohibited.
- ➢ Indulging ragging, anti-institutional, anti-national, antisocial, communal, immoral or political expressions and activities within the Campus and hostel are strongly prohibited as well as punishable.
- ➢ Students are required to check the Notice Board and also website of the college for important announcements.

LABORATORY INSTRUCTIONS

- Students must present a valid ID card before entering the computer lab. Remove your shoes/chapels/sandals outside the lab.
- Playing of games on computer in the lab is strictly prohibited.
- Before leaving the lab, students must close all programs positively and keep the desktop blank.
- Students are strictly prohibited from modifying or deleting any important files and install anysoftware or settings in the computer without permission
- Based on the prime priority, users may be requested by the lab in-charge, to leave the workstationany time and the compliance is a must.
- Eating and/or drinking inside the computer lab is strictly prohibited. Internet facility is only for educational/ study purpose.
- Silence must be maintained in the lab at all times. The lab must be kept clean and tidy at all times.
- If any problem arises, please bring the same to the notice of lab in-charge.
- No bags/ hand bags/ rain coats/ casual wears will be allowed inside the computer lab, however notebook may be allowed.
- Lab timing will be as per the academic time table of different classes Every user must make an entry in the Computer Lab Register properly.
- Each student or visitor must take mobile phones in "Switched Off" mode while entering and orworking in Computer Lab.
- Conversation, discussion, loud talking & sleeping are strictly prohibited. Users must turn-off the computer before leaving the computer lab.
- Maintain silence in lab.
- Computer Lab Assistants are available to assist with BASIC computer and software problems. Food and drink are not permitted in the computer lab.
- The use of cell phones is prohibited in the computer lab.
- Please take your calls outside. We also ask that you put your cell phone on vibrate mode. Unauthorized copying and/or installing of unauthorized software is not permitted
- Tampering with the hardware or software settings will not be tolerated.

CLASSROOM INSTRUCTIONS

- Students should know and obey rules and regulations of department as well as college.
- Students strive to meet Academic Expectations
- students are expected to take all tests at the scheduled times seriously.
- Maintain discipline in the class
- A student should maintain at least 75% attendance in the Lectures of every subject and 100% overall performance. Otherwise, he or she will be debarred from the University Examination.
- Latecomers will not be entertained to enter into the classroom.
- Participate in the activities organized in the Department as well as in the College.
- While discussion, students should conduct and express themselves in a way that is respectful of allpersons.
- Develop positive attitudes;
- Be cooperative and considerate.
- Welcome challenges.
- Be helpful to others
- Be kind, polite, and courteous to others
- Do the assigned work on time
- Be prepared for classes with all necessary supplies.Be
- Respectful and Punctual
- Be in the best of behaviors

DEPARTMENT ACADEMIC PLANNER

ACADEMIC PLANNER 2025-26 SEM-II

Dr. J. J. Magdum Trust's

Dr. J. J. Magdum College of Engineering, Jaysingpur

Department of Computer Science And Engineering

Calendar of Events for the Academic Year 2025-26 (Even Semester)

Week No.	Month	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Events
		Week Days							
1	January 2026	5	6	7	8	9	10	11	➢ 05 – Commencement of Academic Sem-II ➢ 06- 10 – Declaration of Theory and Lab ISE Components, Updating ERP and LMS ➢ 1st week Industrial visit SY & TY
2		12	13	14	15	16	17	18	➢ 17 – Online Parents meet, Project progress presentation-I
3		19	20	21	22	23	24	25	21-23- VAP on Python SY
4		26	27	28	29	30	31		➢ 26–Republic Day ➢ 27- Higher Education- Expert Lecture on Competitive exams (Alumni & higher education) ➢ 31–AMC Meeting ➢ Academic Dean Feedback ➢ 28-30 VAP on AI practices in industry (B.Tech)
Instruction Days: 21									
4								1	➢
5	February 2026	2	3	4	5	6	7	8	➢ 03-04 – Display of Attendance and Counseling of Defaulters for the Month of January, ➢ 06- Expert lecture for Database (TY CSE) ➢ 7- Alumni interaction 1st week- COMPESA Even
6		9	10	11	12	13	14	15	➢ 15 – Maha shivratri, 16-Principal Feedback
7		16	17	18	19	20	21	22	➢ 19 – Ch. Shivaji Maharaj Jayanti, -Cultural ➢ 20-21-Annual Social Function
8		23	24	25	26	27	28		➢ ➢24-25 – Formative Feedback , ➢27- Project progress presentation-II ➢28 – AMC Meeting
Instruction Days: 22									
8								1	

Wk	Month								Events
9	**March 2026**	2	3	4	5	6	7	8	➢ 02-03 – CIE-I ➢ 04 – Holi (2nd Day), ➢ 05-06 – Display of Attendance and Counseling of Defaulters for the Month of February ➢ 7- Parents meet
10		9	10	11	12	13	14	15	➢ 13-CIE-I Result Declaration ➢ 11-13- VAP on Full stack (TY) ➢ 13- Expert lecture on MAD (B.tech)
11		16	17	18	19	20	21	22	➢ 19-Counsellors session-Final year ➢ 20 – Gudhi Padwa, 21 – Id-Ul-Fitr,
12		23	24	25	26	27	28	29	➢ 27 – Ram Navami, 28 – AMC Meeting
13		30	31						➢ 31 – Mahavir Janmakalyanak
Instruction Days: 21									
13	**April 2026**			1	2	3	4	5	➢ 01-02 – Display of Attendance and Counseling of Defaulters for the Month of September, ➢ 03 – Good Friday ➢ 4- Project presentation final
14		6	7	8	9	10	11	12	➢ 10- Expert lecture TOC SY (CSE)
15		13	14	15	16	17	18	19	➢ 18- COMPESA & Campus to Corporate - project competition ➢ 14 – Dr. Babasaheb Ambedkar Jayanti
16		20	21	22	23	24	25	26	➢ 23-24-CIE-II ➢ 24-25 – Summative Feedback
17		27	28	29	30				➢ 30 – PEC Meeting,
Instruction Days: 25									➢
17	**May 2026**				1	2	3		➢ ➢ 1 – Maharashtra Din and Buddha Pournima, ➢ 02-End of Academic Activities, Result declaration of CIE-II ➢ 02-07 – Remedial Classes
18		4	5	6	7	8	9	10	➢ 05 – Submission of ISE Marks, ➢ 06 – Display of Attendance and Defaulters in the Semester, Finalization of List of Detained Students and Submission to the Office of Dean Academics cc to Principal, ➢ 07 – Freezing of Attendance and ISE (Theory and LAB) Marks
19		11	12	13	14	15	16	17	➢ 16-22 – End Semester Examination (Lab POE/ OE)
20		18	19	20	21	22	23	24	
21		25	26	27	28	29	30	31	➢ 26 – Start of End Semester Examination (Theory), 27 – Bakari Id
Instruction Days: 04									➢
22	**June 2026**	1	2	3	4	5	6	7	➢
23		8	9	10	11	12	13	14	➢ 21-World Yoga Day
24		15	16	17	18	19	20	21	➢ 18 – End of End Semester Examination

									(Theory)
25		22	23	24	25	26	27	28	➢ 26 – Muharram
26		29	30						

Note:	A Common Mentoring Activity Slot is to be included during the Last Slot in the Regular Time-Table.
	An In-House Training Slot is to be included in the Regular Time-Table.
	The Probable Date of Result Declaration of End Semester Examination will be 8th July, 2026.
	The probable Date of Reopening/ Commencement of Academic Year 2026-27 Sem – I (Odd Semester) will be 13th July, 2026.
	Mentor Mentee Meeting Monthly Two times

Activities	Public Holidays	Examination

Total Instruction Days: 90

Commencement of Academics	End of Academic Activities (Including Remedial Classes)	CIE-I	CIE-II	End Semester Examination (Theory + Lab)	Make-Up Examination
5th January, 2026	7th May, 2026	02-03 March 2026	23-24 April 2026	16th May to 18th June, 2026	In the Month of July, 2026

Academic Co-ordinator	**HOD CSE**	**DEAN ACADEMICS**	**PRINCIPAL**

DEPARTMENTAL TIME TABLE

B.tech timetable 2025-26 sem II

Academic Year: 2025-26
Class: B.Tech
Class Teacher: Prof. S. A. Narde

Semester: VIII
Classroom No.: C-102
W.e.f.: 28/01/2026

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
09.30 am-10.30 am	DL-PSA	BCT-SAN	BDA-AVG	BDA-AVG	DL-PSA	
10.30 am-11.30 am	BDA-AVG	DL(TUT)-PSA	NLP-AMC	DL-PSA	BCT(TUT)-SAN	
11.30 am -11.40 am	BREAK					
11.40 am -12.40 pm	NLP-AMC	NLP-AMC	BCT-SAN	MAD-RDM	MAD-RDM	
12.40 pm -01.40pm	PS(TUT)-RDM	MAD-RDM	NLP(TUT)-AMC	BCT-SAN	BDA-AVG	
01.40 pm-02.30 pm	LUNCH BREAK					
02.30 pm-03.30 pm / 03.30 pm-04.30 pm	B1-BDA -AVG(DB) B2-MAD-RDM(CN) B3-MAD-ASP(PL) B4-PJ-II(PR)	B1- PJ-II(PR) B2- BDA-AVG(DB) B3- MAD-RDM(CN) B4- MAD-SRM(PL)	B1- MAD-SRM(PL) B2- PJ-II(PR) B3- BDA -AMC(DB) B4- MAD-RDM(CN)	B1- MAD-RDM(CN) B2- MAD-ASP(PL) B3- PJ-II(PR) B4- BDA -AMC(DB)	B1- PJ-II(PR) B2- PJ-II(CN) B3- PJ-II(WT) B4- PJ-II(DB)	

Name of the Subject	Abb.	Name of the Faculty	Practical Venue
Big Data Analytics	BDA	Prof. A. V. Gundavade (AVG)	Database Lab
Deep Learning	DL	Prof. P. S. Ambupe (PSA)	------
Natural Language Processing	NLP	Dr. A. M. Chougule (AMC)	------
Blockchain Technologies	BCT	Prof. S. S. Narde (SAN)	------
Mobile Application Development	MAD	Prof. R. D. Mane(RDM)	Computer Network Lab Programming Lab
Project – II	PJ-II	Dr. A. M. Chougule(AMC) Prof. A. V. Gundavade (AVG) Prof. R. D. Mane(RDM) Prof. A. H. Pudale(AHP) Prof. P. S. Ambupe(PSA) Prof. S. S. Chougule(SSC) Prof. S.R. Mali(SRM) Prof. S. A. Narde(SAN) Prof. A.S. Patil(ASP)	Project Lab Computer Network Lab Web Technology Lab Database Lab
Professional Skills	PS	Prof. R. D. Mane(RDM)	------

TY timetable 2023-24 Sem II

Academic Year: 2025-26
Class: TY B.Tech
Class Teacher: Prof. S. R. Mali

Semester: VI
Classroom No.: C-103
W.e.f.: 28/01/2026

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
09.30 am-10.30 am	ML-ASP	DB-SRM	T1- DB-SRM(CN) T2- DSMP-PSA (PR)	OS-II- SSC	CC-SAN	
10.30 am-11.30 am	EDM-RDM	C#- AHP	T3- OS-II-SSC(OS) T4- CC-SAN(PL)	DB-SRM	DB-SRM	
11.30 am -11.40 am	BREAK					
11.40 am -12.40 pm	T1- OS-II-SSC (OS) T2-CC-SAN (PL)	T1- DSMP-PSA (PR) T2- OS-II-SSC (OS)	OS-II- SSC	T1- C#-AHP(DB) T2- DB-SRM(CN)	T1- CC-SAN(PL) T2 -C#-AHP(DB)	
12.40 pm -01.40pm	T3- C#-AHP (DB) T4- DB-SRM (CN)	T3- CC-SAN (PL) T4- C#-AHP (DB)	EDM-RDM	T3- DSMP-PSA(PR) T4 -OS-II-SSC(OS)	T3- DB-SRM(CN) T4- DSMP-PSA(PR)	
01.40 pm-02.30 pm	LUNCH BREAK					
02.30 pm-03.30 pm	OS-II- SSC	CC-SAN	ML-ASP	OS-II- SSC	ML-ASP	
03.30 pm-04.30 pm	DB-SRM	ML(TUT)-ASP	C#- AHP	CC-SAN	EDM-RDM	

Name of the Subject	Abb.	Name of the Faculty	Practical Venue
Compiler Construction	CC	Prof. S. A. Narde(SAN)	Programming Lab
Operating System-II	OS-II	Prof. S. S. Chougule (SSC)	Operating System Lab
Database Engineering	DB	Prof. S.R. Mali (SRM)	Computer Network Lab
Machine Learning	ML	Prof. A. S. Patil(ASP)	------
E-Commerce & Digital Marketing	EDM	Prof. R. D. Mane (RDM)	------
C# Programming	C#	Prof. A. H. Pudale(AHP)	Database Lab
Domain Specific Mini Project	DSMP	Prof. P.S. Ambupe(PSA)	Project Lab

SY timetable 2025-25 Sem II

Dr. J. J. Magdum Trust's
Dr. J. J. Magdum College of Engineering, Jaysingpur
Department of Computer Science and Engineering

55Academic Year: 2025-26
**Class:** SY B.Tech
Class Teacher: Prof. A. S. Patil

Semester: IV
Classroom No.: C-102/103
W.e.f.: 28/01/2026

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
09.30 am-10.30 am	S1-DB -SAN(DB) S2-MPP-SSC(OS)	S1- PS - RDM(CN) S2- PS -AVG(DB)	EDC/FL	S1- MPP-ASP(WT) S2- DB-SAN(DB)	S1- MPP-SSC(OS) S2- MPP-AMC(WT)	
10.30 am-11.30 am	S3-MPP-AMC(WT) S4-PILM -AHP(PL)	S3- MPP-SSC(OS) S4- MPP-ASP(WT)	EDC/FL	S3- PILM -AHP(PL) S4- PS -RDM(CN)	S3- PS -ASP(CN) S4- DB-AVG(DB)	
11.30 am -11.40 am	BREAK					
11.40 am -12.40 pm	COA-PSA	DB- AVG	S1- PILM -PSA(PR) S2- PILM -AHP(PL)	TOC-ASP	HR-SSC	
12.40 pm -01.40pm	TOC-ASP	TOC-ASP	S3- DB-AVG(DB) S4- MPP-ASP(WT)	DB- AVG	HR-SSC	
01.40 pm-02.30 pm	LUNCH BREAK					
02.30 pm-03.30 pm	PILM-AHP	COA-PSA	DB- AVG	MDM-AHP	MDM-AHP	
03.30 pm-04.30 pm	PS-PSA	LIBRARY	COA-PSA	OE-SRM	OE-SRM	

Name of the Subject	Abb.	Name of the Faculty	Practical Venue
Theory of Computation	TOC	Prof. A. S. Patil (ASP)	------
Database Engineering	DB	Prof. A. V. Gundayade (AVG)	Database Lab
Computer Organization and Architecture	COA	Prof. P. S. Ambupe (PSA)	------
Open Elective	OE	Prof. S. R. Mali (SRM)	Programming Lab
Multi Disciplinary Minor	MDM	Prof. A. H. Pudale (AHP)	------
Mini–Project using Python	MPP	Prof. S.S. Chougule (SSC) Prof. A. S. Patil (ASP) Prof. A. M. Chougule (AMC)	Operating System Lab Web Technology Lab
Professional Skills	PS	Prof. A. S. Patil (ASP), Prof. R. D. Mane (RDM) Prof. A.V.Gundvade(AVG)	Computer Network Lab
Product Innovation and Lifecycle Management	PILM	Prof. A. H. Pudale (AHP)	Programming Lab / Computer Network Lab
Human Rights	HR	Prof. S.S. Chougule (SSC)	------
EDC / Foreign Language	EDC/FL	-	-
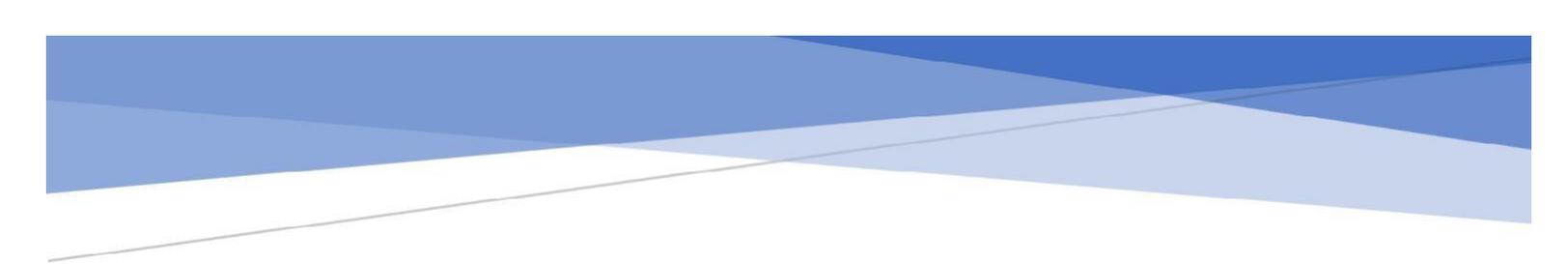
STRUCTURE OF SYLLABUS

Dr.J.J.MagdumTrust's
Dr. J. J. Magdum College of Engineering, Jaysingpur.
(An Autonomous Institute)
Teaching and Evaluation Scheme for Academic Year 2024-25
Program: Computer Science & Engineering
S.Y. B. Tech. (Semester – IV) NCrF Level: 5.0 w.e.f. 2025-26

Sr. No.	Course Code	Course Title	Course Category	Teaching scheme				Course Credits	Evaluation scheme							Total
									Theory				Practical			
				L	T	P	Contact Hrs/wk		CIE			ESE	CIE	ESE		
									T-I	T-II	ISE					
1	01CSEPCL208	Theory of Computation	PCC	3	--	--	3	3	20	20	10	50	---	---	100
2	01CSELPC209	Database Engineering	PCC	3	--	--	3	3	20	20	10	50	---	---	100
3	01CSEPCL210	Computer Organization and Architecture	PCC	3	--	--	3	3	20	20	10	50	---	---	100
4	01OEL220X	Open Elective -02	OE	2	--	--	2	2	20	20	10	50	---	---	100
5	01CSEMDLX202	Multi-disciplinary Minor - 02	MDM	2	--	--	2	2	20	20	10	50	---	---	100
6	01CSEPCP211	Database Engineering Lab	PCC	--	--	2	2	1	---	---	---	---	25	50	75
7	01CSEVSP212	Mini Project using Python	VSEC	--	--	4	4	2	---	---	---	---	50	50	100
8	01CSEACP213	Professional Skill	AEC	1	--	2	3	2	--	--	--	--	25	---	25
9	01CSEECP214	Product Innovation and Lifecycle Management	EEMC	1	--	2	2	2	---	---	---	---	25	50	75
10	01CSEVEP215	Human Rights	VEC	--	--	4	4	2					25		25
		Total		15	0	14	28	22	100	100	50	250	150	150	800
Mandatory Courses (Audit Courses)															
13	01CSEMCP253	Technical Aptitued-1	MC										50		50
14	01CSEMCP254	Professional Skill Enhancement & Foreign Language	MC										50		50

Course Category	BSC/ESC		ProgramCourses		Multidisciplinary Courses		Vocational and Skill Enhancement Course	Humanities Social Science and Management (HSSM)				Experiential Learning Courses				Liberal Learning Courses
	BSC	ESC	PCC	PEC	MDM	OE	VSEC	AEC	Entrp/Mgmt	IKS	VEC	RM	CEP/FP	Proj	Int /OJT	CC
Last Semester Cumulative Credits	16	15	15	--	03	03	02	02	--	02	02	--	02	--	--	04
Semester Credits	--	--	10		02	02	02	02	02	--	02	--	--	--	--	--
Cumulative Sum	16	15	25	--	05	05	04	04	02	02	04	--	02	--	--	04

PROGRESSIVE TOTAL CREDITS: 66 + 22 = 88

THIRD YEAR COMPUTER SCIENCE AND ENGINEERING - CBCS PATTERN															
SEMESTER - VI															
		TEACHING SCHEME								EXAMINATION SCHEME					
		THEORY			TUTORIAL		PRACTICAL			THEORY			ORAL / PRACTICAL		TERMWORK	
Sr. No.	Course Subject / Title	Credits	N0. Of Lectures	No. of Hours	Credits	No. of Hours	Credits	No. of Hours	mode	marks	Total Marks	MIN.	MAX	MIN.	MAX	MIN.
1	PCC-CS601 Compiler Construction	3	3	3			1	2	CIE	30	100	40			25	10
									ESE	70						
2	PCC- CS602 Operating System-II	4	4	4			1	2	CIE	30	100	40			25	10
									ESE	70						
3	PCC- CS603 Database Engineering	4	4	4			1	2	CIE	30	100	40	50	20	25	10
									ESE	70						
4	PCC-CS604 Machine Learning	3	3	3	1	1			CIE	30	100	40			25	10
									ESE	70						
5	OEC- CS605 E-Commerce & Digital Marketing OEC - CS606 ii) Cyber Security	3	3	3					CIE	30	100	40				
									ESE	70						
6	PCC- CS607 C# Programming	2	2	2			1	2					50	20	25	10
7	PW- CS608 Domain Specific Mini Project						1	2					50	20	25	10
	Total (SEM –VI)	19	19	19	1	1	5	10			500		150		150	
	Total (SEM - V+ SEM - VI)	38	38	38	3	4	9	18			1000		250		350	

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for T.Y. Sem V & VI : 800 + 800 =1600
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for T.Y. Sem V & VI : 50 (SEM-V: 25 + SEM -VI: 25)
• In theory examination there will be a passing based on separate head of passing for examination of CIE and ESE.	
• There shall be separate passing for theory and practical (term work) courses.	

Note:

1. **PCC-CS:** Professional Core Course – Computer Science and Engineering are compulsory.
2. **HM-CS:** Humanities and Management- Computer Science and Engineering are compulsory.
3. **PW-CS:** Domain Specific Mini Project — Computer Science and Engineering are compulsory.
4. **#OEC-CS: Open Elective Course –** To be offered to Inter departmental students.
   # - 60% of the students from other branches to be chosen on merit.
   - 40% of the students may be from same branch based on merit.
   - Number of students to be allowed should be 72(Max.) for the branch with intake of 60 students.
   - The above ratio should be followed in proportionate to the sanctioned intake.

OPEN ELECTIVE COURSE-I

Sr. No.	Name of the Subject	Name of the concern Branch
1	i) Computer Graphics & Multimedia ii) Internet of Things	Computer Science and Engineering

OPEN ELECTIVE COURSE-II

Sr. No.	Name of the Subject	Name of the concern Branch
1	i) E-Commerce & Digital Marketing ii) Cyber Security	Computer Science and Engineering

FINAL YEAR COMPUTER SCIENCE AND ENGINEERING - CBCS PATTERN
SEMESTER - VIII

Sr. No.	Course Subject / Title	THEORY Credits	THEORY No. Of Lectures	THEORY No. of Hours	TUTORIAL Credits	TUTORIAL No. of Hours	PRACTICAL Credits	PRACTICAL No. of Hours	THEORY mode	THEORY marks	THEORY Total Marks	THEORY MIN.	ORAL/PRACTICAL MAX	ORAL/PRACTICAL MIN.	TERMWORK MAX	TERMWORK MIN.
1	PCC- CS801 Big Data Analytics	4	4	4			1	2	CIE	30	100	40	50	20	25	10
									ESE	70						
2	PCC- CS802 Deep Learning	3	3	3	1	1			CIE	30	100	40			25	10
									ESE	70						
3	PCE- CS803 Elective-II	3	3	3	1	1			CIE	30	100	40			25	10
									ESE	70						
4	PCE- CS804 Elective-III	3	3	3	1	1			CIE	30	100	40			25	10
									ESE	70						
5	PCC- CS805 Mobile Application Development	3	3	3			2	4					50	20	50	20
6	PW- CS806 Project – II						2	4					50	20	50	20
7	HM-CS807 Professional Skills				1	1									50	20
	Total (SEM –VIII)	16	16	16	4	4	5	10			400		150		250	
	Total	32	32	32	6	6	12	22			800		300		500	

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for Final Yr. Sem VII & VIII : 800 + 800 =1600
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for Final Yr. Sem VII & VIII: 50 (SEM-VII: 25 + SEM -VIII: 25)
• In theory examination there will be a passing based on separate head of passing for examination of CIE and ESE.	
• There shall be separate passing for theory and practical (term work) courses.	

Note:

1. **PCC-CS:** Professional Core Course – Computer Science and Engineering are compulsory.
2. **PCE-CS:** ProfessionalCoreElective–ComputerScienceandEngineeringarecompulsory
3. **HM-CS:** Humanities and Management- Computer Science and Engineering are compulsory.
4. **PW-CS:** Domain Specific Mini Project — Computer Science and Engineering are compulsory.
5. **SI-CS:** Internship-Computer Science and Engineering are compulsory.

Professional Core Elective – I
1. Artificial Intelligence
2. Software Testing & Quality Assurance
3. Image Processing

Professional Core Elective – II
1. Project Management
2. Natural Language Processing
3. Ad-Hoc Wireless Sensor Networks

Professional Core Elective – III
1. High Performance Computing
2. Blockchain Technologies
3. Human computer Interaction

COURSE DETAILS SYLLABUS

S.Y. B.Tech (Computer Science and Engineering)
Sem–IV

Dr J J Magdum College of Engineering, Jaysingpur

Computer Science & Engineering Department
SY- B. Tech -SEM-IV
Course Name: Theory of Computation

Course Details:

Class	SY	Semester	IV
Course Title	Theory of Computation	**Course Code**	Theory: 01CSEPCL208
Prerequisites:			

Teaching scheme:	**Theory Hours:**	3	**Practical Hours:**	--	**Tutorial Hours:**	--
	Credits:	3	**Credits:**	--	**Credits:**	--

Evaluation scheme & Marks

Theory				Practical		Total
T-I	**T-II**	**ISE**	**ESE**	**CIE**	**ESE**	
20	20	10	50	--	--	100

Course Objectives:

The course aims to:

Sr No.	Course Objectives
01CSEPCL208.01	Introduce students to the mathematical foundations of computation, the theory of formal languages and grammars
01CSEPCL208.02	Strengthen the students' ability to understand and conduct mathematical proofs for computations
01CSEPCL208.03	Make the students understand the use of automata theory in Compliers & System Programming.
01CSEPCL208.04	Analyze and design finite automata, pushdown automata, grammars & Turing machines

Course Outcomes:

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

Sr No.	Course Outcomes	Levels of attainment as per revised Bloom's Taxonomy
01CSEPCL208.01	Describe the concepts of regular languages, grammar, and finite automata including their equivalence.	L2
01CSEPCL208.02	Apply Kleene's Theorem and minimize finite automata using state reduction techniques.	L3
01CSEPCL208.03	Simplify context-free grammar and convert them to Chomsky Normal Form.	L3
01CSEPCL208.04	Construct pushdown automata for context-free languages and explain parsing techniques.	L3
01CSEPCL208.05	Explain the structure, types, and computational capabilities of Turing Machines.	L2
01CSEPCL208.06	Analyze decidability and undecidability of languages and understand the basics of	L3, L4

	complexity theory.			

Course Contents

Unit Number	Details	Hours	Course Outcome No.	Levels of attainment as per revised Bloom's Taxonomy
Unit-01	**Mathematical Induction, Regular Languages & Finite Automat** 1.1 Mathematical induction, proofs and types of proofs 1.2 Grammars & languages – definitions and types 1.3 Regular expressions and languages – with examples & applications 1.4 Regular language operations – union, intersection, complement 1.5 Finite automata – definition and DFA 1.6 NFA and NFA with ε-transitions 1.7 Equivalence of DFA, NFA, and NFA-ε	7	01	L2
Unit-02	**Kleene's Theorem & Minimization** 2.1 Kleene's Theorem – Part I (Statement and Proof) 2.2 Kleene's Theorem – Part II (Statement and Proof) 2.3 Minimum state automata 2.4 FA state minimization techniques 2.5 Practical examples and exercises	5	02	L3
Unit-03	**Grammars and Languages Derivations, ambiguity in CFGs** 3.1 Operations on CFLs – Union, Concatenation, Closure 3.2 Eliminating null and unit productions 3.3 Removing useless variables 3.4 Conversion to CNF 3.5 Solved examples and summary	6	03	L3
Unit-04	**Pushdown Automata** 4.1 PDA – definition and deterministic PDA 4.2 PDA types of acceptance (final state, empty stack) 4.3 Equivalence of CFG and PDA 4.4 Top-down parsing 4.5 Bottom-up parsing and examples	5	03	L3
Unit-05	**Turing Machine** 5.1 Models of computation, TM definition 5.2 TM as language acceptors 5.3 Combining TMs and function computation 5.4 Doubly infinite tapes 5.5 Non-deterministic TMs 5.6 Universal TM 5.7 Examples of TMs and language acceptance	7	04	L2

Unit-06	**Undecidability & Complexity Theory**				
	6.1 Decidability of regular and context-free languages				
	6.2 Examples of undecidable problems	6	06		L3, L4
	6.3 Introduction to P, NP, NP-completeness				
	6.4 Time complexity basics				
	6.5 Space complexity basics				
	6.6 Wrap-up and review				

Text Books/Reference Books:

Sr. No	Book Type (Text/Reference)	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
1	Text	Introduction to languages & theory of computations	John C. Martin	Tata McCraw Hill Edition	3rd	2007
2	Text	Introduction to Automata Theory, Languages and computation	John E. Hopcraft, Rajeev Motwani, Jeflrey D.U llman,Jrd 2006.	Pearson Edition	3rd	2006
3	Text	Introduction to theory of computations	Michael Sipser	Cengage Learning	3rd	2012
4	Reference	Discrete Mathematical Structures with applications to computer science	J.P. Trembley& R. Manohar	Tata McGraw Hill	1st	1997
5	Reference	Elements of the Theory of Computation	Harry R. Lewis and Christos H. Papadimitriou	Prentice-Hall	2nd	1997

Online References:

Sr. No.	Website Name	URL	Units Covered
1	NPTEL	https://onlinecourses.nptel.ac.in/noc25_cs70/preview	1-6

Examination Scheme and Guidelines:

T-I 20 Marks	Examination of 20 marks based on Units 1, 2, and 3 should be conducted, and marks should be communicated to the Exam Cell. One question of 05 Marks based on MCQ"s compulsory
T-II 20 Marks	Examination of 20 marks based on Units 4 and 5 should be conducted, and marks should be communicated to the Exam Cell. One question of 05 Marks based on MCQ"s compulsory
ISE 10 Marks	ISE/CA -In Semester Evaluation/Continuous Assessment
ESE 50 Marks	ESE-End Semester Examination Que.1: MCQ"s based on All Units (Carries 06 Marks) Que.2: based on Unit 1, 2 (Carries 16 Marks) Que.3: based on Unit 2, 3 (Carries 16 Marks) Que.4: based on Unit 4 (Carries 16 Marks) Que.5: based on Unit 5 (Carries 16 Marks)

Course Name: **Database Engineering**

Course Details:

Class	SY	Semester	IV
Course Title	Database Engineering	**Course Code**	Theory: 01CSELPC209
Prerequisites:		Set Theory, Data Structures	
Teaching scheme:	**Theory Hours:** 3	**Practical Hours:** ---	**Tutorial Hours:** ---
	Credits: 3	**Credits:** ---	**Credits:** ---

Evaluation scheme & Marks

Theory				Practical		Total
T-I	**T-II**	**ISE**	**ESE**	**CIE**	**ESE**	
20	20	10	50	--	--	100

Course Objectives:

The course aims to:

Sr No.	Course Objectives
01CSELPC209.01	Introduce the fundamental concepts and architecture of database systems.
01CSELPC209.02	Enable students to model data using ER diagrams and relational schemas.
01CSELPC209.03	Develop skills in writing SQL queries for data definition and manipulation.
01CSELPC209.04	Familiarize students with database normalization, transactions, and NoSQL concepts.

Course Outcomes:

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

Sr No.	Course Outcomes	Levels of attainment as per revised Bloom's Taxonomy
01CSELPC209.01	Construct ER diagrams using entities, attributes, relationships, and keys.	L2
01CSELPC209.02	Use SQL commands to define and manipulate relational database structures.	L2
01CSELPC209.03	Interpret and write basic relational algebra operations and SQL queries using aggregation and joins.	L2
01CSELPC209.04	Identify functional dependencies and apply normalization up to 3NF.	L2
01CSELPC209.05	Explain the concept of transactions and basic concurrency control mechanisms.	L1
01CSELPC209.06	Describe types of NoSQL databases and perform simple operations using MongoDB.	L2

Course Contents

Unit Number	Details	Hours	Mapping with COs	Levels of attainment as per revised Bloom's Taxonomy
Unit-01	**Introduction to Databases and ER Modelling** 1.1 Introduction to DBMS: Advantages and Applications 1.2 Database Architecture and Components (Users, Admin, Views) 1.3 Data Models Overview (Hierarchical, Network, Relational) 1.4 ER Model: Entity, Attributes, Keys, Relationships 1.5 ER Diagram Notations 1.6 Concept of Extended ER (only Specialization & Generalization)	5 hrs	01	L2
Unit-02	**Relational Model and Basics of SQL** 2.1 Relational Database Structure: Tables, Rows, Columns 2.2 Mapping ER to Relational Schema 2.3 Referential Integrity, Foreign Keys 2.4 Basic SQL: 2.5 DDL: Create, Alter, Drop 2.6 DML: Insert, Delete, Update 2.7 Constraints 2.8 Querying with SELECT, WHERE, ORDER BY 2.9 Introduction to Joins: INNER and OUTER JOIN 2.10 Views and Nested Queries (only one level)	7 hrs	02	L2
Unit 03	**Advanced SQL and Relational Algebra** 3.1 Aggregate Functions, GROUP BY, HAVING 3.2 Set Operations: UNION, INTERSECT, EXCEPT 3.3 Relational Algebra Basics 3.4 Introduction to Tuple and Domain Relational Calculus 3.5 Complex Queries	06hrs	03	L2
Unit-04	**Database Design & Normalization** 4.1 Schema Design Importance 4.2 Functional Dependencies and Closure 4.3 Normal Forms: 1NF, 2NF, 3NF (BCNF only conceptually) 4.4 Decomposition (only Lossless Join & Dependency Preservation) 4.5 Avoiding Anomalies	06hrs	04	L2
Unit-05	**Transaction Processing and Concurrency Control** 5.1 Transactions, ACID Properties 5.2 Transaction States 5.3 Serializability (Conceptual) 5.4 Concurrency Control:	06hrs	05	L1

		5.5 Lock-based Protocols (2PL overview) 5.6 Deadlock: Detection and Prevention 5.7 Overview of Recovery (atomicity, durability, concept only)			
Unit-06	Overview of NoSQL 6.1 Need for NoSQL, Differences from RDBMS 6.2 Types of NoSQL: Document, Column, Key-Value, Graph (overview) 6.3 JSON Document Structure 6.4 Introduction to MongoDB: Basics, insert/find commands 6.5 Use cases of NoSQL 6.6 Relational vs NoSQL recap		06hrs	06	L2

Text Books/Reference Books:

Sr. No	Book Type (Text / Reference)	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
1	Text	Database System Concepts	Abraham Silberschatz, Henry F. Korth, S. Sudarshan	McGraw-Hill.	6th	2010
2	Text	Database Systems - A Practical Approach to Design, Implementation and Management	Thomas Connolly, Carolyn Begg	Addison Wesley.	4th	2005
3	Text	Professional NOSQL	Shashank Tiwari	Wrox	1st	2011

Online References:

Sr. No.	Website Name	URL	Units Covered
1	https://nptel.ac.in/	https://nptel.ac.in/courses/106105175	1-5
2	https://www.udemy.com/	https://www.udemy.com/course/mongodb-the-complete-developers-guide/?couponCode=IND21PM	6

Examination Scheme and Guidelines:

T-I 20 Marks	Examination of 20 marks based on Units 1, 2, and 3 should be conducted, and marks should be communicated to the Exam Cell. • One question of 05 Marks based on MCQ"s compulsory
T-II 20 Marks	Examination of 20 marks based on Units 4 and 5 should be conducted, and marks should be communicated to the Exam Cell. • One question of 05 Marks based on MCQ"s compulsory
ISE 10 Marks	ISE/CA -In Semester Evaluation/Continuous Assessment
ESE 50 Marks	ESE-End Semester Examination Que.1: MCQ"s based on All Units (Carries 06 Marks) Que.2: based on Unit 1, 2 (Carries 16 Marks) Que.3: based on Unit 2, 3 (Carries 16 Marks) Que.4: based on Unit 4 (Carries 16 Marks) Que.5: based on Unit 5 (Carries 16 Marks)

Course Details:

Class:	Second Year	Semester:	III
Course Title:	Computer Organization and Architecture	Course Code:	Theory: 01CSEPCL210
			Practical:--
Prerequisites:		Basics of Computer	

Teaching scheme:	**Theory Hours:**	Lectures: 03Hrs./week	**Practical Hours:**	-	**Tutorial Hours:**	-
	Credits:	3	**Credits:**	-	**Credits:**	-

Evaluation scheme

Theory				Practical		Total
T-I	**T-II**	**ISE**	**ESE**	**CIE**	**ESE**	
20	20	10	50	-	-	100

Course Objectives:

The course aims to:

Sr No.	Course Objectives
01CSEPCL210.01	To introduce various generations of computers, their working and basic architecture.
01CSEPCL210.02	To discuss the basic of I/O addressing and access.
01CSEPCL210.03	To make the students aware of overall design and architecture of computer and its organization.

Course Outcomes:

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

Sr No.	Course Outcomes	Levels of attainment as per revised Bloom's Taxonomy
01CSEPCL210.01	Understanding of the evolution of computers, computer organization basics with the use of the architecture diagram	L2
01CSEPCL210.02	Understand the concept of I/O organization	L2,L3
01CSEPCL210.03	Apply the different algorithms to perform arithmetic operations	L3
01CSEPCL210.04	Articulate the design issues in the development of processor	L3
01CSEPCL210.05	Conceptualize instruction level parallelism	L2
01CSEPCL210.06	To make aware of basic organization of memory unit	L2

	Course Contents

Unit Number	Details	Hours	Course Outcome	Levels of attainment as per revised Bloom's Taxonomy
Unit-01	**Basic Computer Organization** 1.1. Organization and Architecture 1.2. Von Neumann Architecture, Harvard architecture 1.3. Structure and Function 1.4. A Brief History of Computers 1.5. Computer Components 1.6. Computer Function 1.7. Bus Interconnection 1.8. Difference between RICS and CISC	06	01	L2
Unit-02	**Input and Output Organization** 2.1. External Devices 2.2. I/O Modules 2.3. Programmed I/O 2.4. Interrupt-Driven I/O 2.5. Direct Memory Access 2.6. Standard IO Interface 2.7. Handling multiple devices	06	02	L2,L3
Unit-03	**Arithmetic Unit** 3.1. Addition and Subtraction of Signed Numbers 3.2. Design of fast Adders 3.3. Multiplication of Positive numbers 3.4. Signed Operand Multiplication 3.5. Fast Multiplication 3.6. Integer Division 3.7. Floating Point Number Operations: IEEE 754 Floating Point Format (Single & Double Precision Format)	07	03	L3
Unit-04	**The Processing Unit** 4.1. Some fundamental Concepts 4.2. Execution of complete Instruction 4.3. Single bus organization 4.4. Multiple bus organization 4.5. Hardwired control 4.6. Micro programmed Control	06	04	L3
Unit-05	**Parallel Processing** 5.1. Basic Concepts 5.2. Role of Cache Memory 5.3. Pipeline Performance 5.4. Data Hazards: Operand Forwarding. 5.5. Handling Data Hazards in Software and Side Effects. 5.6. Instruction Hazards: Unconditional Branches and Conditional Branches and Branch Prediction.	06	05	L2
Unit-06	**Memory Organization** 6.1. Some Basic Concepts 6.2. Types of Memories: ROM and	05	06	L2

	RAM 6.3. Semiconductor RAM memory 6.4. Cache Memories: Mapping functions 6.5. Replacement Algorithms.		

Text Books/Reference Books:

Sr. No	Book Type(Text/Reference)	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
01	Text	Computer Architecture and Organization	William Stallings	Pearson Education	8th Edition	2013
02	Text	Computer Architecture and Organization	John P Hayes	MGH	3rd Edition	2013
03	Reference	Computer Systems Organization & Architecture	John D. Carpinelli	Pearson Education	3rd Edition	2008
04	Reference	Computer Organization	Carl Hamacher, Zvonko Vranesic and Safwat Zaky	Tata McGraw Hil	5th Edition	2009

Online References:

Sr. No.	Website Name	URL	Units Covered
01	https://archive.nptel.ac.in	https://archive.nptel.ac.in/courses/106/105/106105163/	All

List of Assignments for ISE:

- Student should be able to complete 5-6 assignments based on the syllabus and concepts

Examination Scheme and Guidelines :

T-I 20 Marks	Examination of 20 marks based on Units 1, 2, and 3 should be conducted, and marks should be communicated to the Exam Cell. • One question of 05 Marks based on MCQ"s compulsory
T-II 20 Marks	Examination of 20 marks based on Units 4 and 5 should be conducted, and marks should be communicated to the Exam Cell. • One question of 05 Marks based on MCQ"s compulsory
ISE 10 Marks	ISE/CA -In Semester Evaluation/Continuous Assessment
ESE 50 Marks	ESE-End Semester Examination
	Que.1: MCQ"s based on All Units (Carries 06 Marks)
	Que.2: based on Unit 1, 2 (Carries 16 Marks)
	Que.3: based on Unit 2, 3 (Carries 16 Marks)
	Que.4: based on Unit 4 (Carries 16 Marks)
	Que.5: based on Unit 5 (Carries 16 Marks)

Course Name: Database Engineering Lab

Course Details:

Class	SY	Semester	IV
Course Title	Database Engineering	**Course Code**	Theory: --
			Practical : 01CSEPCP211
Prerequisites:		Set Theory, Data Structures.	

Teaching scheme:	**Theory Hours:**	---	**Practical Hours:**	2	**Tutorial Hours:**	---
	Credits:	---	**Credits:**	1	**Credits:**	---

Evaluation scheme & Marks

Theory				Practical		Total
CIE-I	**CIE-II**	**ISE**	**ESE**	**CIE**	**ESE**	
--	--	--	--	25	50	75

Course Objectives:

The course aims to:

Sr No.	Course Objectives
01CSEPCP211.01	Provide hands-on experience in installing and using relational DBMS like MySQL/Oracle.
01CSEPCP211.02	Enable students to model real-world scenarios using E-R diagrams and transform them into normalized relational schemas.
01CSEPCP211.03	Implement data definition, data manipulation, and integrity constraints using SQL.
01CSEPCP211.04	Explore advanced SQL operations, concurrency control, and NoSQL database concepts with practical application.

Course Outcomes:

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

Sr No.	Course Outcomes	Levels of attainment as per revised Bloom's Taxonomy
01CSEPCP211.01	Install and configure relational and NoSQL database management systems like MySQL, Oracle, and MongoDB.	L3
01CSEPCP211.02	Construct E-R diagrams for domain-based applications and convert them into relational tables.	L3
01CSEPCP211.03	Use SQL and NoSQL commands to create, manipulate, and query data using DDL, DML, integrity constraints, and joins.	L3
PCC-01CSEP212.04	Demonstrate the use of functional dependencies, canonical covers, hashing, and concurrency control mechanisms in database systems.	L4

List of Practical/Experiment for CIE/ESE:

Student should be able to perform 10-12 experiments based on the syllabus and concepts mentioned below:

Experiment Number	Type of Experiment (Basic /Design/Advanced/ Mini/Minor Projects/ Seminar/ Case Studies)	Experiment Title	Course Outcome No.	Levels of attainment as per revised Bloom's Taxonomy
1.	Basic	Installation and demonstration of DBMS like MySQL/Oracle	01	L1
2.	Basic	Draw E-R Diagram for different applications like – Library Management Systems, College Management Systems, Hospital Management Systems etc	02	L2
3	Basic	Convert E-R Diagrams into relational tables.	02	L2
4	Basic	Use DDL Statements to Crete, Alter, Drop, Rename, Truncate Tables	03	L1
5	Basic	Use DML Statements to Insert, Select, Update, Delete Data	03	L1
6	Basic	Use referential integrity constraints with foreign key, on delete cascade and on delete set null.	03	L1
7	Basic	Use of aggregate functions, group by – having clause and order by clause	03	L1
8	Basic	Use of Joins	03	L1
9	Basic	Use of Set Operations	03	L1
10	Basic	Creation of Indices and Views in SQL	03	L2
11	Basic	Use of set operations like union, intersections & set difference	03	L1
12	Basic	Display the results of Join Operations like cross join, self join, inner join, natural join, left outer join, right outer join and full outer join	03	L2
13	Basic	Find Canonical Cover and Closure for set of functional dependencies.	04	L3
14	Basic	Demonstration of Hashing – Static hashing, Dynamic hashing	04	L1
15	Basic	Study of concurrency control mechanisms	04	L1
16	Basic	Perform installation of NoSQL database and explore the tools and commands available with database	01	L1
17	Basic	Design a simple NoSQL database e. g. MongoDB (Installation, Basic CRUD operations, Execution).	01	L1

Examination Scheme and Guidelines:

CIE (Practical) (25 Marks)	Continuous Assessment, As per institute policy
ESE 50 Marks	ESE-End Semester Examination

Course Name: Mini Project Using Python

Course Details:

Class:	Second Year	Semester:	III
Course Title:	Mini Project Using Python	Course Code:	Theory: --
			Practical: 01CSEVSP212

Prerequisites:	Basics of C Programming

Teaching scheme:	Theory Hours:	--	Practical Hours:	4	Tutorial Hours:	-
	Credits:	--	Credits:	2	Credits:	-

Evaluation scheme

Theory				Practical		Total
CIE-I	CIE-II	ISE	ESE	CIE	ESE	
-	-	-	-	50	50	100

Course Objectives:

The course aims to:

Sr No.	Course Objectives
01CSEVSP212.01	To expose the students to solve the real world problems.
01CSEVSP212.02	To utilize the techniques. Skills and modern Engineering tools for building the project.
01CSEVSP212.03	To follow the methods and tasks as per SDLC approach

Course Outcomes:

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

Sr No.	Course Outcomes	Levels of Attainment as per Revised Bloom's Taxonomy
01CSEVSP212.01	Define the problem statement	L2
01CSEVSP212.02	Organize, Plan and prepare the detailed project activities.	L3,L4
01CSEVSP212.03	Construct Flowchart, System Architecture based on the project description.	L3
01CSEVSP212.04	Implement the solution for their problem.	L3

Course Contents

1. The Mini Project should be undertaken preferably by a group of 3-4 students who will jointly work together and implement the project.
2. Identify a real-world problem or challenge that requires a software solution.
3. Conduct a comprehensive analysis of existing technologies, research findings, and industry practices relevant to the problem.
4. Design an innovative software solution considering the identified problem and available resources.
5. Apply advanced project management techniques to create a project plan, including tasks, timelines, and resource allocation.
6. The Mini Project topic should be based on the any one subject concepts that students have studied for their Academic Year.
7. The group will select the project with the approval of the guide and submit the name of the project with a synopsis of the proposed work not more than 02 to 03 pages.
8. In the Synopsis they have to state Flowchart, Usage of the logic, algorithm, functions and suitable data structure for implementing the solution. They have to implement project using python.

Platform: Python Language

Learning activities for the students:
Self-Learning Assignments, Converting specifications to Code, Innovative Solutions

Text Books/Reference Books:

Sr. No	Book Type (Text/Reference)	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
01	Reference	Learning Python	Mark Lutz	Orelly Publication	5th edition	2013
02	Reference	Python Programming for Absolute Beginners	Michel Dawson	Cengage Learning	3rd edition	2010

Online References:

Sr. No.	Website Name	URL	Units Covered
01	Python Documentation	https://docs.python.org/3/	All
02	Youtube	https://www.youtube.com/watch?v=9MmC_uGjBsM&list=PLyqSpQzTE6M_Fu6l8irVwXkUyC9Gwqr6_	

Examination Scheme and Guidelines :

CIE (Practical) (50 Marks)	Continuous assessment as per institute policy

ESE 50 Marks	External practical oral evaluation

Course Name: Professional Skill

Course Details:

Class:	SY B.Tech.	Semester	IV
Course Title	Professional Skill	**Course Code**	Theory: 01CSEACP213
			Practical: 01CSEACP213
Prerequisites:			

Teaching scheme:	**Theory Hours:**	1	**Practical Hours:**	2	**Tutorial Hours:**	
	Credits:	1	**Credits:**	1	**Credits:**	

Evaluation scheme

Theory				Practical		Total
T-I	**T-II**	**ISE**	**ESE**	**CIE**	**ESE**	
--	--	--	--	25		25

Course Objectives:

The course aims to:

Sr.No.	Course Objectives
01CSEACP213.01	To develop effective communication skills required in the corporate and technical world.
01CSEACP213.02	To enhance interpersonal and presentation skills of engineering students.
01CSEACP213.03	To introduce students to recent trends in business and digital communication.
01CSEACP213.04	To enable students to draft clear, concise, and professional business documents.
01CSEACP213.05	To prepare students for interviews, group discussions, and workplace collaboration.

Course Outcomes:

On successful completion of the course, students will be able to:

SrNo.	Course Outcomes	Levels of Attainment as per Revised Bloom's Taxonomy
01CSEACP213.01	Apply the fundamental principles of effective business writing to compose clear, concise, and coherent documents.	L3
01CSEACP213.02	Develop self-awareness and use behavioral skills like decision-making, leadership, and time/stress management to improve personal and professional growth.	L2, L3
01CSEACP213.03	**Use** effective oral communication skills in presentations, virtual meetings, interviews, and group discussions with proper tools, etiquette, and strategies.	L3
01CSEACP213.04	**Exhibit** effective digital communication by building a professional online presence, using social media responsibly, and creating impactful content for platforms like LinkedIn.	L3

Course Contents			
Unit Number	**Details**	**Hours**	**Cognitive Levels of Attainment as per Revised Bloom's Taxonomy**
Unit-01	**Written Business Communication** 1.1 Principles of Business Writing 1.2 Application and Resume writing 1.3 Email Etiquette & Professional Email Writing 1.4 Technical Report Writing (Project, Research, Data Analysis Reports)	3	L2
Unit-02	**Behavioral Skills** 2.1 Self Understanding, SWOT Analysis 2.2 Positive Attitude and Decision Making 2.3 Leadership Skills and Team building 2.4 Time and Stress Management 2.5 Corporate Manners and Etiquettes	3	L2, L3, L4
Unit-03	**Oral and Virtual Communication** 3.1 Professional Presentation Skills (Using PPT, Data Visualization) 3.2 Virtual Meeting Etiquette (Google Meet, Zoom, MS Teams) 3.3 Interview Preparation: HR + Technical Rounds 3.4 Group Discussion and Debates	3	L3, L4
Unit-04	**Communication for Digital Presence** 4.1 Role of **communication in human-AI interaction** 4.2 LinkedIn Profile Creation and Optimization	3	L3

		4.3 Building a Personal Brand Online 4.4 Responsible Social Media Use		

Textbooks/Reference Books:

Sr. No	Book Type(Text/Refere nce)	Name of theBook	Name of the Author	Publisher	Edition	Year of Publication
1	Reference	Technical Communicat ion	Meenakshi Raman & Sangeeta Sharma	Oxford University Press.	paperbac k	2022
2	Reference	Excellence in Business Communicat ion	John V. Thill, Courtland Bovee	Pearson Higher Ed,	14	2023
3	Reference	**Effective Technical Communica tion**	M. Ashraf Rizvi	McGraw Hills	2	2017

Online References:

Sr. No.	Website Name	URL	Units Covered
1	Swayam NPTEL	https://swayam.gov.in/nc_details/N PTEL	2,3
2	Coursera	https://www.coursera.org/courses? query=business%20communication	3,4,5

List of Assignments/Tutorials for ISE:

- Minimum06Assignments/Tutorials based on the curriculum.

**Suggested List of Practical/Experiment for
CIE/ESE:**

- Minimum10 Experiments based on the
curriculum.

Experiment Number	Type of Experiment (Basic /Design/Advanced/Mi ni/ Minor Projects/ Seminar/Case Studies)	Experiment Title	Levels of attainment as per Bloom's Taxonomy
1.	Design	Drafting a Professional Email	L3
2.	Design	Resume and LinkedIn Profile Development	L3
3	Case study	A Student Team Misses a Deadline Due to Poor Communication	L3

Examination Scheme and Guidelines :

CIE (Practical) (25Mark)	Continuous assessment as per institute policy

Course Name: Product Innovation and Lifecycle Management

Course Details:

Class	S.Y. B. Tech.	Semester	IV
Course Title	Product Innovation and Lifecycle Management	**Course Code**	Practical: 01CSEP215
Prerequisites:			
Teaching scheme:	**Theory Hours:** 1	**Practical Hours:** 2	**Tutorial Hours:** ---
	Credits: 1	**Credits:** 1	**Credits:** ---
Evaluation scheme			
Theory		**Practical**	**Total**

CIE-I	CIE-II	ISE		ESE	CIE	ESE	
---	---	---		---	25	50	75

Course Objectives:

Sr. No.	Course Objectives
Entrp-01CSEP215.01	To understand the key stages and types of product innovation, including the distinction between incremental and disruptive innovation, to support creative engineering solutions.
Entrp-01CSEP215.02	To introduce design thinking as a structured approach to solving engineering problems and guide the development of Minimum Viable Products (MVPs).
Entrp-01CSEP215.03	To equip students with the skills required to create UI/UX wireframes and efficiently manage product-related data using modern tools like Figma and Git.
Entrp-01CSEP215.04	To develop an understanding of market launch strategies, pricing models, and monetization techniques, enabling students to evaluate product success and scalability.

Course Outcomes:

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

Sr. No.	Course Outcomes	Cognitive Levels
Entrp-01CSEP215.01	Understand how to commercialize and pitch innovative product ideas.	L1
Entrp-01CSEP215.02	Apply design thinking to build and refine MVPs.	L2
Entrp-01CSEP215.03	Create UI/UX wireframes and manage product data.	L3
Entrp-01CSEP215.04	Evaluate strategies for product launch and growth.	L3

	Course Contents		
Unit Number	**Unit Title**	**Hours**	**Levels of Attainment as per Revised Bloom's Taxonomy**
Unit-01	**Foundations of Product Innovation** 1.1 Innovation vs. Invention, Types (Product, Process, Radical, Incremental), Innovation in tech, 1.2 New Product Development (NPD) Stages: Idea generation → Concept testing → Product design → Launch, 1.3 Tools for Ideation: Brainstorming, SCAMPER, TRIZ, Mind Mapping, Examples from tech startups	3	L1, L2
Unit-02	**Design Thinking and MVP Development** 2.1 Design Thinking Process: Empathize, Define, Ideate, Prototype, Test; application to CS problems, 2.2 MVP and Agile Development: Minimum Viable Product, Lean Startup model, Agile methodology, 2.3 Product Lifecycle Stages (PLM): Lifecycle stages: Introduction → Growth → Maturity → Decline; software vs. hardware lifecycle	3	L2
Unit-03	**Product Design, UX & Data Management** 3.1 Software vs. Hardware Product Lifecycle: Differences in iteration, deployment, and updates, 3.2 UI/UX 3.2 Design and Prototyping Tools: Wireframing, mockups, Figma/Adobe XD; user-centered design, 3.3 Product Data Management & Git: Version control (Git/GitHub), engineering change control, configuration management	3	L2
Unit-04	**Commercialization and Project Pitch** 4.1 Go-to-Market Strategy: Market research, segmentation, launch plans, feedback loops, 4.2 Monetization and Business Models: Freemium, licensing, subscriptions, value proposition canvas, 4.3 Case 4.3 Study & Student Pitch: Real-world examples + student project demo & reflection	3	L2

Examination Scheme and Guidelines:

ISE 25 Marks	CA - Continuous Assessment based on two in semester presentations.
ESE 50 Marks	Final Project Evaluation by External Examiner

Books:

Sr. No	Book Type (Text / Reference)	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
1	Text Book	*Product Design and Development*	**Karl T. Ulrich & Steven D. Eppinger**	McGraw-Hill Education	7th	2020
2	Text Book	*Innovation and Entrepreneurship*	**Peter F. Drucker**	Harper Business	Reprint edition (HarperBusiness paperback)	2006
3	Reference Book	**Product Lifecycle Managemen**	John Stark	Springer	2nd	
4	Reference Book	**The Lean Startup**	Eric Ries		1st (standard hardcover & paperback)	
5	Reference Book	**The Design of Everyday Things**	Don Norman		**Revised and Expanded Edition**	

Web References:

Units Covered	URL	Units Covered
NPTEL – Product Management	https://nptel.ac.in/courses/110105139/	Unit 1, 2, 4
Coursera – Product Innovation	https://www.coursera.org/learn/uva-darden-product-innovation	Unit 1–3
Figma Tutorials	https://help.figma.com/	Unit 3
Harvard Business School Online – Disruptive Strategy	https://online.hbs.edu/courses/disruptive-strategy/	Unit 4
MIT OpenCourseWare – Innovation	https://ocw.mit.edu/courses/find-by-topic/#cat=business&subcat=innovation	Unit 1, 2

List of Assignments/Tutorials for ISE:
Mini project development based on the curriculum.

Examination Scheme and Guidelines:

CIE 25 Marks	The students should give at least two progress presentations intermediately as per the guidance of supervisor.
ESE 50 Marks	At the end of semester with final presentation, student should present a final report justifying the applicability, relevance and significance of the work.

Course Name: Human Rights

Course Details:

Class	SY	Semester	IV
Course Title	**Human Rights**	**Course Code**	Theory: 01CSEVEP215
			Practical:--
Prerequisites:		-	
Teaching scheme:	**Theory Hours:**	2Hrs./week	**Practical Hours:**	-	**Tutorial Hours:**	-
	Credits:	2	**Credits:**	-	**Credits:**	-
Evaluation scheme						

Theory				Practical		Total
CIE-I	**CIE-II**	**ISE**	**ESE**	**CIE**	**ESE**	
-	-	-	-	25	-	25

Course Objectives:

The course aims to:

Sr No.	Course Objectives
01CSEVEP215.01	Provide a foundational understanding of human values and their significance in personal and societal development.
01CSEVEP215.02	Develop critical thinking and problem-solving skills for addressing ethical dilemmas in diverse societal contexts.
01CSEVEP215.03	Analyze the ethical challenges and dilemmas arising from rapid globalization, technological advancements, and economic growth.

Course Outcomes:

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

Sr No.	Course Outcomes	Levels of Attainment as per Revised Bloom's Taxonomy
01CSEVEP215.1	**Understand and articulate core human values** such as respect, empathy, integrity, responsibility, and compassion	L2
01CSEVEP215.2	**Analyze ethical issues and challenges** related to governance, sustainability, and global citizenship	L4
01CSEVEP215.3	**Demonstrate an awareness of ethical frameworks** that can guide decision-making in global development contexts	L2
01CSEVEP215.4	**Identify and evaluate various therapeutic approaches,** including physical therapies, psychological interventions, and alternative healing methods	L3
01CSEVEP215.5	Demonstrate a commitment to lifelong learning and active engagement in	L2

	advancing and defending human rights		
01CSEVEP215.6	**Understand and appreciate the role of non-state actors,** especially **NGOs, civil society, and media**, in monitoring, reporting, and advocating for human rights protection and awareness.	L2	

Course Contents	

Unit Number	Details	Hours	Mapping with COs	Levels of Attainment as per Revised Bloom's Taxonomy
Unit-01	**Concept of Human Values, Value Education Towards Personal Development** 1.1 Aim of education and value education; 1.2 Evolution of value oriented education; 1.3 Concept of Human values; types of values; 1.4 Components of value education. 1.5 Personal Development: Self-analysis and introspection; 1.6 Sensitization towards gender equality, physically challenged	04hrs	01	L2
Unit-02	**Value Education Towards National and Global Development** 2.1 National and International Values: Constitutional or national values -Democracy, socialism, equality, justice, liberty, freedom 2.2 Social Values - Pity and probity, self-control, universal brotherhood. 2.3 Professional Values - Knowledge, thirst, sincerity in profession, regularity, punctuality and faith. 2.4 Religious Values - Tolerance, wisdom, character.	04hrs	02	L4
Unit-03	**Impact of Global Development on Ethics and Values** 3.1 Conflict of cross-cultural influences, mass media 3.2 Cross-border education, materialistic values, professional challenges and compromise. 3.3 Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality 3.4 Comparison and competition;	04hrs	03	L2

	positive and negative thoughts.			
Unit-04	**Therapeutic Measures** 4.1 Control of the mind through- Simplified physical exercise , Meditation -Objectives, types, effect on body, mind and soul c. 4.2 Yoga – Objectives, Types, Asanas 4.3 Activities: (i) Moralisation of Desires (ii)Neutralisation of Anger (iii)Eradication of Worries (iv) Benefits of Blessings.	04hrs	04	L3
Unit-05	**Human Rights** 5.1 Concept of Human Rights – Indian and International Perspectives 5.2 Evolution of Human Rights 5.3 Definitions under Indian and International documents 5.4 Broad classification of Human Rights and Relevan 5.5 Constitutional Provisions- Right to Life, Liberty and Dignity, Right to Equality, Right against Exploitation	04hrs	05	L2
Unit-06	**Challenges and Contemporary Issues** 6.1 Human rights violations: Custodial deaths, torture, encounter killings 6.2 Terrorism and national security vs human rights 6.3 Human rights in conflict zones and under-represented regions 6.4 Role of NGOs and media in promoting human rights	04hrs	06	L2

Text Books/Reference Books:

Sr. No	Book Type(Text/Reference)	Name of the Book	Name of the Author	Publisher	Year of Publication
1	Reference Book	The United Nations and Human Rights: A Critical Appraisal	Alston, Phillip, ed.,	Oxford: Clarendon Press	New York, 1990
2	Reference Book	The United Nations and Human Rights	Ankumah, Evelyn A.	The African Commission on Human and People's Rights: Practice and Procedures (The Hague: Martinus Nijhoff	1996

Examination Scheme and Guidelines :

CIE (Practical) (25 Marks)	Continuous assessment as per institute policy

COURSE DETAILS SYLLABUS

T.Y.B. Tech(Computer Science and Engineering)Sem– VI

T.Y. B.Tech (Computer Science and Engineering) Sem–VI

1. Compiler Construction (PCC - CS601)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	**Theory :** ESE 70 Marks CIE 30 Marks
Tutorial : -----	**Term work :** 25 Marks
Practical : 2 Hrs./Week	**Oral : -----**

Pre-requisites: C, System Programming, Data structures

Course Objectives

1. To introduce the fundamentals of compilers and their phases.

2. To design and implement phases of a compiler.

3. To expose the students to various tools like LEX and YACC.

Course Outcomes

1. Recall the compiler phases and compiler construction tools like LEX and YACC.

2. To design and implement Lexical Analyzer for a simple language.

3. To design and implement Syntax analyzer for a simple expression.

4. To apply Syntax directed translations and Syntax Directed definitions to generate intermediate code.

5. To identify appropriate code optimizing transformation for the given code.

6. To **e**xplain concept of code generation.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction:** Compilers, Phases of a compiler, Compiler construction tools, cousins of the compiler.	**5**
2.	**Lexical Analysis:** Role of a Lexical analyzer, input buffering, specification and recognition of tokens, finite automata implications, designing a lexical analyzer generator.	**6**
3.	**Syntax Analysis**: Role of Parser, Writing grammars for context free environments, Top-down parsing, Recursive descent and predictive parsers (LL), Bottom-Up parsing, Operator precedence parsing, LR, SLR and LALR parsers	**7**

| 4. | **Syntax Directed Translation and Intermediate Code Generation**: Syntax directed definitions, construction of syntax tree, S-attributed definitions, L-attributed definitions, Intermediate languages, assignment statements, back patching. | 7 |

5.	**Code Optimization**: Principle sources of optimization, optimization of Basic Blocks, loops in flow graphs, Peephole optimization	**5**
6.	**UNIT 6- Code Generation**: Issues in design of a code generator and target machine, Run time storage management, Basic blocks and flow graphs, Next use information and simple code generator, Issues of register allocation, code generation from Dags.	**6**

Term Work

Minimum of 10 to 12 experiments should be carried out based on the following experiments based on following list.

Practical List

Minimum of 10 to 12 experiments should be carried out based on the following experiments.

1. Design of preprocessor for C program.
2. Design a complete lexical analyzer for C language.
3. Program to create a symbol table generator.
4. Design a syntax analyzer for simple expression in c language using top down parsing.
5. Program to create a syntax tree for simple expression in c language using recursive descent parsing.
6. To implement intermediate code generator for Boolean expression in three address code format.
7. Implement intermediate code generator for the conditional statements in three address code format.
8. Implement any one bottom up parsing [LR, SLR, LALR, Operator precedence] technique.
9. To implement a program for code generator from labeled tree.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1.	Compilers - Principles, Techniques and Tools	A. V. Aho, R .Shethi and J. D. Ullman	Pearson Education	ALL Units

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1.	Compiler construction	D.M. Dhamdare	Mc-Millan	-
2.	LEX & YACC	Dong Brown, John Levine, Tony Mason	O'Reilly 2nd Edition	Refer for Practical's

2. Operating System -II (PCC - CS602)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 4 Hrs./Week	**Theory** : ESE 70 Marks CIE 30 Marks
Tutorial : -----	**Term work:** 25 marks
Practical: 2 Hrs./Week	**Practical** : -----

Pre-requisites: Data Structures, Concepts of Process, deadlock and System calls.

Course Objectives

1. Fundamental architecture of UNIX operating system kernel.
2. Detail algorithms of buffer cache management.
3. Internal File system organizations and related algorithms in UNIX.
4. System calls for UNIX file system.
5. Process structure, creation and management in UNIX.
6. Architecture and algorithms of process scheduling and memory management.
7. I/O subsystem architecture and algorithms.

Course Outcomes

Upon Completion of this course, students will be able to:

1. To understand UNIX kernel, its architectural components like file subsystem, process control subsystem, memory management.
2. To understand a concrete way (UNIX i-nodes) of organizing a file system on a physical storage medium.
3. To maintain UNIX directories, files, manage processes, manipulate data with proper use of pipes and file redirection, UNIX filters.
4. To implement and handle various UNIX system calls.
5. To explain the principles of paging, virtual memory (VM) and describe the data structures and components (both hardware and software) that are necessary to implement it.
6. To perform shell programming involving decision control, looping and control flow statements on UNIX based machines.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction and buffer cache:** **General Overview of the System** - History, System Structure, User Perspective, Operating System Services, Assumptions About Hardware, Architecture of the UNIX OS, Introduction to System Concepts, Kernel Data Structure, System Administration. **Buffer Cache: -** Buffer Headers, Structure of the BufferPool, Scenarios for Retrieval of a Buffer, Reading and Writing Disk Blocks, Advantages and Disadvantages of Buffer Cache.	**10**
2.	**Internal Representation of Files:** I-nodes, Structure of the Regular File, Directories, Conversion of a Pathname to I-node, Super Block, I-node Assignment to a New File, Allocation of Disk Blocks, Other File Types.	**8**
3.	**System Calls for File System:** Open, Read, Write, File and Record Locking, Adjusting the Position of FILE I/O-LSEEK, Close, File Creation, Creation of Special Files, Change Directory and Change Root, Change Owner and Change Mode, Stat and FStat, Pipes, Dup, Mounting and Un-mounting File Systems, Link, Unlink, File System Abstractions, File System Maintenance.	**6**
4.	**The Structure of Processes:** Process States and Transitions, Layout of System Memory, The Context of a Process, Saving Context of a Process, Manipulation of the Process Address Space**.**	**8**
5.	**Process Control and Scheduling:** Process Control: - Process Creation, Signals, Process Termination, Awaiting Process Termination, Invoking Other Programs, The User ID of a Process, The Shell, System Boot and the Init Process. Process Scheduling: - Process Scheduling, System Calls for Time, Clock.	**8**
6.	**Memory management and I/O Subsystem:** Swapping, Demand Paging, A Hybrid System with Demand Paging and Swapping. Driver Interfaces, Disk Drivers, Terminal Drivers, Streams.	**8**

Term Work

- It should consist of minimum 10-12 experiments based on the above topics and covering the following list of assignments. (Reference book – Linux System Programming by Robert Love may be referred for the assignments listed below.)

1. Demonstration of how the Linux Kernel implements and Manages files.

2. Implement User Buffer I/O using 'C' program.

3. Study & Implement file management using low level file access system calls.

4. Implementation of various operations on Files (Create, Open, Read, Write, Append, Fstat, Dup etc.,)
5. Implementation of various system call (OPEN, READ, WRITE) by reader & writer process.
6. Study & Implementation of pipe () system call.
7. Demonstration of UNIX Process Management – from process creation to process termination.
8. Study & Implementation of signal () system call.
9. Study and demonstration of different Memory Management Techniques.
10. Study and Implement Time, Sleep and Clock Management.
11. Client - Server communication using IPC mechanism: Unnamed pipe, Named pipe.
12. Implementation of Shell Scripts.
13. Implementation of system call for UNIX/Linux.
14. Study of boot loader like "Grub"
15. Study of compilation of Linux kernel.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	The design of Unix Operating System	Maurice J. Bach	PHI	**All Units**

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Linux System Programming	Robert Love	SPD, O' REILLY
2	Unix concepts & administration	Sumitabha Das	Tata McGrow Hill, 3rd Edition

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3. Database Engineering (PCC - CS603)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 4 Hrs./Week	**Theory :** ESE 70 Marks CIE 30 Marks
Tutorial : -----	**Term work :** 25 marks
Practical: 2 Hrs./Week	**Practical :** 50 Marks

Pre-requisites: Set Theory, Operating System, Data Structures.

Course Objectives

1. To understand fundamental concepts and algorithms of Database Systems.
2. To gain familiarity with SQL and DBMS.
3. To learn database design techniques.

Course Outcomes

1. Understand fundamentals of database management systems.
2. Represent logical design of database using E-R Diagram.
3. Analyze & construct good database design.
4. Apply SQL queries to design & manage the database.
5. Understand transactions, concurrency control and apply to database system.
6. Understand failures in database and appropriate recovery techniques.

UNIT NO.	UNIT Name and Contents	NO. OF LECTURES
1.	**INTRODUCTION TO DATABASES [Text Book 1]** Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Database Users & Administrators, Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.	**8**
2.	**E-R MODEL AND DATABASE DESIGN** **[E-R Model: Text Book 1] [Normalization: Text Book 2]** E-R Model: The Entity-Relationship Model, Mapping Constraints, Keys, Entity-Relationship Diagrams, Reduction to Relational Schemas, Extended ER features-Specialization, Generalization, Aggregation. Normalization: Data Redundancies & Update Anomalies, Functional Dependencies. Canonical Cover, The Process of Normalization, First Normal Form, Second Normal Form, Third	**10**

	Normal Form, Boyce-Codd Normal Form, Fourth Normal Form, Fifth Normal Form.	
3.	**STRUCTURED QUERY LANGUAGE (SQL) [Text Book 1]** Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Aggregate Functions, Nested sub Queries, Modification of Databases, Join expression, Views.	**8**
4.	**DATA STORAGE & INDEXING [Text Book 1]** Physical storage media, File Organization, Organization of records in File, Data Dictionary Storage, Database Buffer, Basic Concepts indexing & hashing, Ordered Indices, B+ Tree Index files, Multiple-Key Access, Static Hashing, Dynamic Hashing.	**8**
5.	**TRANSACTION MANAGEMENT [Text Book 1]** Transaction Concept, A Simple Transaction Model, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols.	**9**
6.	**RECOVERY SYSTEM [Text Book 1]** Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Failure with Loss of Nonvolatile Storage, Remote Backup Systems.	**5**

Term Work

Minimum 12 -14 Experiments based on the following topics.

1. Draw an E-R Diagram of any organization.

2. Reduce above mentioned E-R Diagram into tables.

3. Normalize any database from first normal form to Boyce-Codd Normal Form (BCNF).

4. Write a program of Database connectivity with any object oriented language.

5. Use DDL Queries to create, alter (add, modify, rename, drop) & drop Tables.

6. Use DML Queries to insert, delete, update & display records of the tables.

7. Create table with integrity constraints like primary key, check, not null and unique.

8. Create table with referential integrity constraints with foreign key, on delete cascade and on delete set null.

9. Display the results of set operations like union, intersections & set difference.

10. Display the results of Join Operations like cross join, self join, inner join, natural join, left outer join, right outer join and full outer join.

11. Display the records using Aggregate functions like min, max, avg, sum & count. Also use group by, having clauses.

12. Display the results using String operations.

13. Create & Update views for any created table.

14. Write java program to implement dense and sparse indexing

15. Write java program to implement B+ tree indexing.

16. Write java program to implement static hashing.

17. Study of NoSql.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Database System Concepts	A. Silberschatz, H.F. Korth, S. Sudarshan	6th Edition, McGraw Hill Education.	**1,3,4,5,6**
2	Database Systems - A practical approach to Design, Implementation and Management	Thomos Connolly, Carolyn Begg	3rd Edition, Pearson Education	**2**

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Database Systems – Design, Implementation and Management	Rob & Coronel	5th Edition Thomson Course Technology	**3**
2	Fundamentals of Database Systems	Ramez Elmasri, Shamkant B. Navathe	4th Edition, Pearson Education	**2**

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4. Machine Learning (PCC - CS604)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	**Theory :** ESE 70 Marks CIE 30 Marks
Tutorial :1 Hrs./Week	**Term work :** 25 marks
Practical : -----	**Practical : -----**

Pre-requisites: Linear Algebra, Statistics, Probability Theory.

Course Objectives

1. To understand Machine Learning Aspects.

2. To understand primitives in learning process by Computer.

3. To understand nature of problems solved with Machine Learning.

Course Outcomes

On completion of the course, student will be able to

1. Explain Machine Learning concepts.

2. Analyze the Machine Learning model.

3. Design solution using Machine Learning techniques.

4. To tackle real world problems in domain of data mining, information retrieval, computer vision, linguistics and bioinformatics, etc.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction to Machine Learning:** Introduction to Probability and Statistics, **Machine Learning:** Definition, Terminology, Types of learning, Machine Learning Problem categories, Machine learning architecture, process, Lifecycle, Performance measures, tools and framework, data visualization.	06
2.	**Regression:** **Simple regression** – hypothesis, cost function, parameter learning with gradient descent, learning rate, Gradient Descent for linear regression, examples, simple regression in matrix form. **Multivariate Linear Regression** – Multiple features, hypothesis functions, Gradient Descent for multiple variables, Feature scaling, polynomial regression	06
3.	**Classification- logistic regression & Naïve Bayes :** **Logistic Regression** – Definition, Hypothesis representation, decision boundary, cost function, Gradient Descent for Logistic Regression. Multiclass Classification, **Regularization** - Over fitting &Under fitting, cost function, Regularized Linear Regression, Regularized Logistic Regression, Conditional probability and Naïve Bayes Classifier. Instance-based classifier – K- Nearest Neighbor Classifier, Bayesian Network, Hidden Markov Model.	07
4.	**Classification- Decision trees and Support Vector Machine:** **Decision trees:** definition, terminology, the need, advantages, and limitations. Constructing and understanding Decision trees, common problems with Decision trees, Decision tree algorithms, random forest, examples. **Support Vector Machine:** What is SVM, Kernel Trick, Cost Function, Decision Trees vs. Support Vector Machine.	06
5.	**Unsupervised learning :** Clustering, K Means clustering, Hierarchical clustering, Association Rule mining.	04
6.	**Neural Network & Recommendation System:** **Neural Networks-** Neuron representation and model, Hypothesis for neuron, cost function, solution of a problem using single neuron. Gradient descent for a neuron. Neural network, Multiclass classification with neural network. Learning in neural network-back propagation algorithm **Recommendation System:** Popularity based recommender engines, Content based recommendation engines, Classification based recommendation engine, Collaborative filtering.	07

Term Work

- It should consist of minimum 10-12 assignments based on the above topics.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Machine Learning with Python- an approach to applied ML	Abhishek Vijayvargia	BPB Publications	**All Units**
2	Practical Machine Learning	Sunila Gollapudi	Packt Publishing Ltd	**1,2**
3	Machine Learning	Tom M. Mitchell	McGraw Hill Education; First Edition	**1,2,3,4,5**

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Machine Learning for dummies	John Paul Muller	Willey Publication	
2	Introduction to Machine Learning	EthemAlpaydin	PHI 2nd Edition-2013	**1,2**
3	http://neuralnetworksanddeeplearning.com/			**6**

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5. Open Elective Course - II (OEC- CS605)

E- Commerce & Digital Marketing (OEC - CS605)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	**Theory** : ESE 70 Marks CIE 30 Marks
Tutorial : -----	**Term work : -----**
Practical : -----	**Practical : -----**

Course Objectives:

1. To get the knowledge about business advantages of the e-commerce and digital marketing and its importance

2. To develop a digital marketing plan and to make SWOT analysis

3. To get introduced with various digital channels, business tools in social networking

4. To understand the optimization of a Web site and SEO optimization

Course Outcomes:

1. Students will be able to identify the importance of the e-commerce and digital marketing for business success
2. Students will be able to create a digital marketing plan, starting from the SWOT analysis and defining a target group
3. Students will be able to identifying digital channels, business tools used in social networking
4. Students will be able to demonstrate the optimization of web site using business tools.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction to E-commerce, frameworks & architectures** **Introduction:** The term "E-Commerce", Business models related to E-Commerce, Technical and economic challenges **Frameworks and architectures:** Actors and stakeholders, Fundamental sales process, Technological elements	**(4)**
2.	**B2C business, B2B business** **B2C Business:** The process model and its variants, The pricing challenge, The fulfillment challenge, The payment challenge, B2C-business and CRM, B2C software systems **B2B business:** The process model and its variants, B2B software systems	**(5)**

3.	**Introduction to Digital Marketing** How digital technologies transformed marketing?, Definitions-digital marketing and multichannel marketing- Paid, owned and earned media, the growing range of digital marketing platform, digital marketing strategy-key features of digital marketing strategy, applications of digital marketing, benefits of digital marketing, alternative digital business models, difference between e-commerce and e-business, challenges in developing and managing digital marketing strategy	**(6)**
4.	**Online marketplace analysis & macro environment** **Introduction:** situation analysis for digital marketing, the digital marketing environment, understanding customer journeys, online consumer behavior and implications for marketing, business models for e-commerce **Online macro environment**: Technological forces, economic forces, political forces, Legal forces, social forces and culturalforces	**(8)**
5.	**Digital Marketing Strategy and relationship marketing** **Digital Marketing strategy development**: how to structure digital marketing strategy, strategy implementation **Relationship marketing using digital platforms**: Introduction,the challenge of customer engagement, customer lifecycle management	**(6)**
6.	**Marketing Communications** Marketing Communications using digital media channels: Introduction, search engine marketing, online public relations, e-mail marketing and mobile text messaging, social media and viral marketing, offline promotion techniques. **Case study:** How the ministry of food processing took to social media or world food India 2017.	**(7)**

Text Books:

1. Introduction to E-commerce: Combining Business & Information Technology 1st Edition, (2016) Martin Kutz. & bookboon.com
2. Digital Marketing: Strategy, Implementation and Practice, 6th Edition by Dave Chaffey, Fiona Ellis-Chadwik, Pearson Education.

Reference Books:

1. The Beginner's Guide to Digital Marketing (2015). Digital Marketer.
   Pulizzi, J.(2014) Epic Content Marketing, McGraw Hill Education.
2. "Electronic Commerce", Jeffrey F Rayport and Bharat Bhasker, Tata McGraw Hill.

It should consist of assignments on following topics within group of 4-5 students & its evaluation will beconsidered for CIE

1. Define a target group (working in groups)

2. Creating web sites, MS Expression (working in groups)

3. Writing the SEO content (working in groups)

4. Google AdWords (working in groups)

5. CRM strategy (working in groups)

T. Y. B. Tech (Computer Science and Engineering) Sem – VI

5. Open Elective Course - II (OEC - CS606)

Cyber Security (OEC - CS606)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	**Theory** : ESE 70 Marks CIE 30 Marks
Tutorial : -----	**Term work** : -----
Practical : -----	**Practical** : -----

Prerequisite: Fundamental knowledge of Data Communication, Networking and Information Security.

Course Objectives:

1. To gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks

2. To examine secure software development practice

3. To understand key terms and concepts in I.T. ACT

4. To incorporate approaches for incident analysis and response

Course Outcomes:

On completion of the course, student will be able to

1. Explain the cyber security concepts.

2. Describe the cyber security vulnerabilities and prevention techniques.

3. Explain the different rules and regulations under I.T. ACT.

4. Explain the concepts of digital forensics & incident management

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Computer and Network Security** Introduction to Computer Security - Introduction, How Seriously Should You Take Threats to Network Security?, Identifying Types of Threats, Basic Security Terminology, Concepts and Approaches, Online Security Resources Networks and the Internet : Introduction, Network Basics, How the Internet Works, Basic Network Utilities , Advanced Network Communications Topics	**06**
2.	**Cyber Frauds, DoS, Viruses:** Cyber Stalking, Fraud, and Abuse: Introduction, How Internet Fraud Works, Identity Theft, Cyber Stalking, Protecting Yourself	**06**

	Against Cyber Crime. Denial of Service Attacks: Introduction,DoS, Illustrating an Attack, Malware: Introduction, Viruses, Trojan Horses, The Buffer-Overflow Attack. The Sassier Virus/Buffer Overflow, Spyware, Other Forms of Malware, Detecting and Eliminating Viruses and Spyware	
3.	**Techniques Used by Hackers :** Introduction, Basic Terminology, The Reconnaissance Phase, Actual Attacks, Malware Creation, Penetration Testing	**06**
4.	**Computer Security Technology:** Introduction, Virus Scanners, Firewalls, Antispyware, IDS, Digital Certificates, SSL/TLS, Virtual Private Networks, Wi-Fi Security	**06**
5.	**I.T. ACT:** Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, I.T. Act	**06**
6.	**Introduction to Forensics:** Introduction, General Guidelines, Finding Evidence on the PC, Finding Evidence in System Logs , Getting Back Deleted Files, Operating System Utilities, Operating System Utilities, Mobile Forensics: Cell Phone Concepts	**06**

Text Books:

1. Computer Security Fundamentals - Chuck Easttom, Pearson, third edition.

Reference Books:

1. Jason Luttgens, Matthew Pepe, Kevin Mandia, Incident Response & Computer Forensics, McGraw-Hill Osborne Media, 3 rd edition , 2014.
2. Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Real Digital Forensics: Computer Security and Incident Response, Paperback – Import, 2005.
3. John Sammons, the Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics Paperback, February 24, 2012.
4. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George.Kurtz, McGraw-Hill, 2005.
5. Ethical Hacking, Thomas Mathew, OSB Publisher, 2003.
7. Dave Shackleford, Virtualization Security: Protecting Virtualized Environments, John Wiley & Sons, 2012.
8. BRAGG, Network Security: The Complete Reference, McGraw Hill Professional, 2012

6. C# Programming (PCC - CS607)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 2 Hrs./Week	**Theory : -----**
Tutorial : -----	**Term work :** 25 marks
Practical : 2 Hrs./Week	**Practical :** 50 marks

*Pre-requisites***:** C++, Java, HTML

Course Objectives

1. Understand code solutions and compile C# projects within the .NET framework
2. Demonstrate knowledge of object-oriented concepts using C#.NET application
3. Create and manipulate GUI components in C# and interact with database using ADO.NET in window based application
4. Create network based and multithreaded applications using C#
5. Creating ASP.Net applications using standard .net controls
6. Maintain session and controls related information for users in multi-user web applications

Course Outcomes

1. Students will be able to develop correct, well-documented programs using the C# programming language.
2. Students will be able to learn to develop object-oriented programs using C# classes and objects
3. Students will be able to learn to use Windows Forms and WPF to create GUI-based programs
4. Students will be able to build networking and multithreading based programs using C#
5. Students will be able to design web applications using ASP.NET using ASP.NET controls in web applications.
6. Students will be able to debug and deploy ASP.NET web applications and create database driven ASP.NET web applications.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**.Net architecture and C# Basics:** **.Net Architecture:** The Relationship of C# to .NET, The Common Language Runtime, A Closer Look at Intermediate Language, Assemblies, .NET Framework Classes, Namespaces, **C# basics**: Predefined data types, The Main () Method, More on Compiling C# Files, Console I/O, Using Comments# Programming Guidelines, Dynamic variables, DLL creation & calling.	**3**

2.	**Object oriented programming in C# :** Classes and Structs, Class Members, Anonymous Types, Structs, Partial Classes, Static Classes, The Object Class, Extension Methods, **Inheritance**: Types of Inheritance, Implementation Inheritance, Modifiers, Interfaces	**4**
3.	**Arrays, Operators and casts and strings:** **Arrays**: Simple Arrays, Multidimensional Arrays, Jagged Arrays, Array Class, Array and Collection Interfaces, Enumerations **Operators and casts:** Operators, Type Safety, Comparing Objects for Equality, Operator Overloading, User-Defined Casts, **String:** System. String, Building Strings, String Builder Members, Format Strings, Regular Expressions.	**4**
4.	**Windows Form & Database with ADO.NET:** Introduction to GUI application & components –add data control programmatically, Link data to control, process all control, track the visible forms, Find all MDI child forms, Save configuration setting for form, Force list box to scroll items, Restrict text box, Use of auto complete combo-box ,Sort a list view, Database with ADO.NET-Overview of Ado.NET, Data components in Visual Studio .NET.	**5**
5.	**Threading and Networking:** **Threading:** Overview, Asynchronous Delegates, the Thread Class and Thread Pools, Threading Issues, Synchronization, and Timers. **Networking:** Networking-Obtain information about Local network, Detect changes in network, Download data over HTTP or FTP, Download a File & Process using Stream, Respond to HTTP request from your application.	**4**
6.	**Introduction to ASP.NET 4.5** ONE ASP.NET: Introducing One ASP.NET, Simplifying a Complex Ecosystem, How Do You Benefit? **ASP.NET web form structure:** Application Location Options, The ASP.NET Page Structure Options, ASP.NET 4.5 Page Directives, ASP.NET Page Events, Dealing with Post backs, Cross-Page Posting ,ASP.NET Application Folders, Compilation, Build Providers, Global.aspx	**4**

Term Work

1. It should consist of 10 to 12 experiments based on the above syllabus covering following list of assignments
2. 50% of the experiment should be console based & 40 % experiment should be windows form application. and 10% should be web-based application

Practical List:

1. Language Introduction (Includes console-based application, creation of DLL, running a program without IDE) calling a method from another program.
2. OOPS concepts in C#-Class, Implementation Inheritance, Extension methods (Use any application).
3. Develop DLL file and use it in application program. (Use Any application)
4. Implementation of Interface Inheritance (Use Any Application).
5. Implementation of Multidimensional & Jagged array (Use Any application).
6. Use of properties in any application.
7. Implementation of Operator overloading (Any application).
8. String manipulation using String & String builder(Any application)
9. Develop program to use Regex. Matches method and Regular Expression pattern matching.
10. Design a Windows Form based application for different controls.(Any application)
11. Design a Windows Form based MDI application with different controls.(Any application)
12. Design a Windows Form based application for field validation.(Any application)
13. Design a any Windows Form based application with Database connectivity with all field validation.(Any application)
14. Develop a Win1dows Form application that performs SELECT, INSERT, UPDAE & DELETEqueries and also displays the List of Books available in a Library System by fetching the details froma database. The C# application must also contain the filter capability.
15. Implement console-based networking application to obtain information of network & detect changes in network.
16. Design a Windows form application to download file & process it using stream.
17. Simple ASP.NET web application deployment in IIS server
18. Design simple login and registration page using client-side validation controls in ASP.NET
19. Do the server-side validation by using database connectivity for above problem and display all the records of database when successfully logged in using ASP.NET.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Professional C# 2012 & .Net 4.5	Christian Nagel, Bill, Evjen, Jay Glynn, Morgan Skinner, Karli Watson	Wrox Publication	1 to 2 and unit 3 (threading)
2	A Programmer's Guide to ADO.Net in C#	Mahaesh Chand	Apress Publication	Unit 3 Windows app and ADO.NET
3	Visual C# 2010 Recipes- A Problem-Solution Approach	Allen Jones, Adam Freeman, Matthew MacDonald, Rakesh Rajan	Apress Publication	Unit 3 Windows app and ADO.Net and Unit 4 networking
4	Professional ASP.NET 4.5 in C# and VB	John Wiley & Sons Inc.	WROX publication	Unit 4 ASP part and Unit 5 and 6

__Reference Books__

Sr. No.	Title	Author(s) Name	Publication & Edition
1	ASP.NET 4.5-Black book	Kogent	Dreamtech Publication

7. Domain Specific Mini-project (PW - CS608)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : -----	Theory : -----
Tutorial : -----	Term work : 25 marks
Practical : 2 Hrs./Week	Practical : 50 marks

Pre-requisites:

1. Software Engineering Concepts
2. Object Oriented Concepts

Course Objectives

1. To expose the students to use engineering approach to solve domain specific real time problem.
2. To use the appropriate and newer technologies while developing the project.
3. To learn the skills of team building and team work.

Course Outcomes

Upon successful completion of this course, the student will be able to –

1. Identify specific problem statement from a selected domain.

2. Analyze the problem and prepare SRS and design document.

3. Write code and carry out testing.

4. Write a report covering details of the project and give presentation on a project.

Contents

The students should form group of 4 to 5 students and every group is supposed to choose a specific domain (preferably from Smart India Hackathon problem statement) to do the mini project. Further the group should identify the relevant problem in the selected domain and propose the solution, which can be implemented as a mini-project using suitable technology. The mini-project work should be evaluated by a team of teachers appointed by the department.The evaluation and marking should include Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) during which the group should give presentation and demonstration of their work done. Care should be taken to avoid out-sourcing of the work.

COURSE DETAILS SYLLABUS

Final Year B. Tech (Computer Science and Engineering) Sem– VIII

Final Year B. Tech (Computer Science and Engineering)Semester-VIII

1. Big Data Analytics (PCC - CS801)

TEACHING SCHEME	EXAMINATION SCHEME
Theory :4 Hrs./Week	**Theory :** ESE 70 Marks CIE 30 Marks
Tutorial :	**Term work : 25 Marks**
Practical : 2 Hrs./Week	**POE : 50 Marks**

Pre-requisites: Operating Systems, Hadoop, Java, Networking, Machine Learning and Databases.

Course Objectives

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.
2. Acquire clear understanding of R & Hadoop.
3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.
4. Manage Big Data and analyze Big Data.
5. Apply tools and techniques to analyze Big Data.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.
2. Acquire clear understanding of R & Hadoop.
3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.
4. Manage Big Data and analyze Big Data.
5. Apply tools and techniques to analyze Big Data.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**INTRODUCTION TO BIG DATA :** Big Data and its Importance – Four V's of Big Data – Drivers for Big Data –Introduction to Big Data Analytics – Big Data Analytics applications, Architecture Components, Massively Parallel Processing (MPP) Platforms, Unstructured Data Analytics and Reporting, Big Data and Single View of Customer/Product, Data Privacy Protection, Real-Time Adaptive Analytics and Decision Engines.	8
2.	**INTRODUCTION TO R &HADOOP :** Getting Ready to Use R and Hadoop, Installing R, Installing R Studio, Understanding the features of R language, Installing Hadoop, Understanding Hadoop features, Learning the HDFS and MapReduce architecture, Writing Hadoop MapReduce Programs, Introducing Hadoop MapReduce, Understanding the Hadoop MapReduce fundamentals, Writing a Hadoop MapReduce example, Learning the different ways to write Hadoop MapReduce in R, Hadoop Ecosystem, Hadoop YARN, Hbase, Hive, Pig and Pig latin, Sqoop, ZooKeeper, Flume, Oozie.	8
3.	**INTEGRATION OF R & HADOOP :** Integrating R and Hadoop, Introducing RHIPE, Understanding the architecture of RHIPE, Understanding RHIPE samples, Understanding the RHIPE function reference, Introducing RHadoop, Understanding the architecture of RHadoop, Understanding RHadoop examples, Understanding the RHadoop function reference. HADOOP STREAMING WITH R Using Hadoop Streaming with R - Introduction, Understanding the basics of Hadoop Streaming, Understanding how to run Hadoop streaming with R, Understanding a MapReduce application, Exploring the Hadoop Streaming R package.	8
4.	**DATA ANALYTICS WITH R AND HADOOP :** Understanding the data analytics project life cycle – Introduction, Identifying the problem, Designing data requirement, Preprocessing data, Performing analytics over data, Visualizing data, Understanding data analytics problems, Exploring web pages categorization Case Studies: Computing the frequency of stock market change, Predicting the sale price of blue book for bulldozers.	8

5.	**SPARK FOR BIG DATA ANALYTICS :** The advent of Spark, Limitations of Hadoop, Overcoming the limitations of Hadoop, Theoretical concepts in Spark: Resilient distributed datasets, Directed acyclic graphs, SparkContext, Spark Data Frames, Actions and transformations, Spark deployment options, Spark APIs, Core components in Spark: Spark Core, Spark SQL, Spark Streaming, GraphX, MLlib, The architecture of Spark	8
6.	**UNDERSTANDING BIG DATA ANALYSIS WITH MACHINE LEARNING :** Introduction to machine learning, Types of machine-learning algorithms, Supervised machine learning algorithms, Unsupervised machine learning algorithm, Recommendation algorithms, Steps to generate recommendations in R, Generating recommendations with R and Hadoop.	8

Term Work

- o Minimum of 10-12 Experiments to be performed from the list given below.

Experiment List

1. Installation of Hadoop.

2. Building Hadoop MapReduce application for counting frequency of word/phrase in simple text file.

3. Study and demonstration of Hadoop YARN Administration command and User commands.

4. Configure Hive demonstrate following

   - Write and execute a Hive query

   - Define Hive External table

   - Define Partitioned Hive Table

5. Demonstrate following on Hive

   - Load data into Hive table from HDFS

   - Update row in Hive table

   - Delete row from a Hive Table

6. Working with operators in Pig - FOREACH, ASSERT, FILTER, GROUP, ORDERBY, DISTINCT, JOIN, LIMIT, SAMPLE, SPLIT,FLATTEN.

7. Write and execute a Pig script

- Load data into a Pig relation without a schema
- Load data into a Pig relation with a schema
- Load data from a Hive table into a Pig relation

8. Installation of R studio and demonstration of following

- R basic Syntax.
- Exploring basic R Data Types.
- Drawing Pie chart, Bar Chart, Histogram, etc.
- R array and Vector.

9. Working with R with data sets- create, read, write and R Tables- create, read, write.

10. Manipulating and processing data in R - merging datasets, sorting data, putting data into shape, managing data using matrices managing data using data frames.

11. Study of RHIPE (R and Hadoop Integrated Programming Environment)

- Installing Hadoop.
- Installing R.
- Installing protocol buffers.
- Setting up environment variables.
- Installing rJava.
- Installing RHIPE.

12. Identifying the frequency of all the words that are present in the provided input text files using RHIPE Environment.

13. Installation and configuration of Apache Spark on Local Machine.

14. Write an application to Read multiple text files into single RDD using Spark.

15. Implementation of Linear regression with R and Hadoop.

16. Case studies should consist of but not limited to following: Big Data Analytics in Healthcare, Big Data Analytics In Immunology: A Knowledge-Based Approach, Big Data Analytics Embedded Smart City Architecture For Performance Enhancement Through Real-Time Data Processing And Decision-Making.

17. Case Study How Data Science Helped in development COVID-19 Vaccine.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Big Data Analytics: Disruptive Technologies for Changing the Game	Arvind Sathi	IBM Corporation, 2012	Unit - I
2	Big Data Analytics with R and Hadoop	Vignesh Prajapati	Packt Publishing 2013	Unit - II, III, IV, VI
3	Practical Big Data Analytics	Nataraj Dasgupta	Packt Publishing 2018	Unit - V

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1.	Big Data (Black Book)	DT Editorial Services	Dreamtech Press
2.	Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Business	Michael Minelli, Michehe Chambers	AmbigaDhiraj, Wiely CIO Series, 2013.
3.	Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics	Bill Franks	Wiley and SAS Business Series, 2012
4.	Hadoop: The Definitive Guide	Tom White	O'reilly, 2012
5.	Big Data Analytics	Seema Acharya, Subhasini Chellappan	Wiley, 2015
6.	Big Data Analytics with Hadoop 3	Sridhar Alla	Packt Publishing, 2018
7.	Big Data Analytics: Methods and Applications	Jovan Pehcevski	Arcler Press

2. Deep Learning (PCC - CS802)

TEACHING SCHEME		EXAMINATION SCHEME	
Theory :3 Hrs./Week		**Theory** : ESE 70 Marks CIE 30 Marks	
Tutorial :1 Hrs./Week		**Term work: 25 Marks**	
Practical : NA		**Practical : NA**	

Pre-requisites: Machine Learning**.**

Course Objectives

1. Understand the basic concepts of deep learning networks

2. Introduce different models of deep learning to work with various types of inputs.

3. Learn effects of different parameters and hyper-parameters on deep learning model output.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Describe basic concepts of artificial intelligence and deep learning.

2. Develop different deep learning models for given tasks.

3. Devise the correct parameters and hyper-parameters of developed model for getting

   improved results.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Neural Network and Deep Learning** Introduction to AI, ML and Deep Learning, A brief history, Need of Deep Learning, Basics of neural network, Data representation for neural network, Gradient based optimization, anatomy of neural network.	7
2.	**Introduction to Tensor flow, Keras and hyperparametersTensor flow:** Introduction, Downloading and installation of Tensor flow, The computation graph, Modelling cyclic dependencies, Building and running visualization, Computing graph and distribution, Simple math operation and distribution, Tensors, Rank of tensors, Tensor math, Numpy and tensors, Tensorflow example, **Keras:** Introduction, Models, Layers, Pre-	7

	processing, Deep Learning case studies, **Hyperparameters:** Learning rate, No of iterations, hidden layers, hidden units, choice of activation function, momentum, mini batch size, Overfitting and underfitting, regularization	
3.	**Convolutional Neural Networks** The convolutional operation, The max pooling operation, Training a convnet from scratch on a small dataset, Using pre-trained convnet, Visualizing what convnet learn	6
4.	**Sequence Models** One hot encoding, Using word embeddings, A recurrent layer in Keras, Understanding the LSTM and GRU layers, Example of LSTM in Keras, Advanced use of Recurrent Neural Network	6
5.	**Advanced Deep Learning Best Practices** Going beyond the sequential model: The Keras functional API, Inspecting and monitoring deep learning models using Keras callbacks and Tensor Board, Getting the most out of your models	5
6.	**Generative Deep Learning** Text generation with LSTM, Deep Dream, Neural Style Transfer, Generating images with variational auto encoders, Introduction to generative adversarial network.	5

Term Work

- Minimum of 10 Tutorials to be performed from the list given below.
- Practical should include the implementation and use of the following mechanisms/Algorithms/Tools /Techniques

Tutorial List

1. Installing of Anaconda or Miniconda and working with Tensorflow and Keras
2. Introduction and working with Google Colab for using GPUs and TPUs for large projects
3. Developing simple perceptron (single layer neural network)
4. Developing simple multilayer neural network for different tasks
5. Designing and developing basic CNN for given task
6. Using transfer learning in CNN
7. Designing and developing simple RNN for given task
8. Designing and developing RNN with LSTM for given task
9. Designing and developing RNN with GRU for given task
10. Designing and developing model for Text generation using LSTM
11. Designing and developing model for Neural style transfer
12. Designing and developing model for generating images

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Deep Learning with Python	Francois Chollet	

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Deep Learning	by Ian Good fellow, Yoshua Bengio, Aaron Courville	MIT Press Book

3. PROJECT MANAGEMENT (PCE- CS803) Elective-II

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	**Theory :** ESE 70 Marks CIE 30 Marks
Tutorial :1 Hrs./Week	**Term work: 25 Marks**
Practical :	**Practical : –**

Pre-requisites: Software Engineering Concept, Operations Management

Course Objectives

1. Provide students with a basic understanding of project management principles and practices.

2. Demonstrate competency in the creation and management of a project plan

3. Understanding impact of Scope, Time and Cost management.

4. Understanding the software quality metrics and quality assurance.

5. Develop strategies to calculate risk factors involved in IT projects

6. Understand the Agile development practices and driving forces for taking an Agile approach to software development.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Understand project characteristics and various stages of a project.

2. Understand the conceptual clarity about project organization and feasibility analyses

3. Analyze the learning and understand techniques for Project planning, project risk, scheduling and Execution

4. Resolve IT related crises using project management

5. Manage the phases and infrastructure of IT projects

6. Describe fundamental concepts of agile methodology and agile development practices

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction to Project Management:** Project and Project Management (PM), Role of project Manager, System view of PM, Organization, Stakeholders, Project phases and lifecycle, Context of IT projects, process groups, mapping groups to Knowledge areas	5
2.	**Project Integration Management:** Strategic planning and project selection, Developing a Project Management Plan, Directing and Managing Project Work, Monitoring and Controlling Project Work, Performing Integrated Change Control, Closing Projects or Phases	5
3.	**Project Scope, Time and Cost management:** Planning Scope Management, Collecting Requirements, Defining Scope, Creating the Work Breakdown Structure, Validating Scope, Controlling Scope Planning Schedule Management, Defining Activities, Sequencing and Estimating Activity, Resources & Duration, Developing & Controlling Schedule Basic Principles of Cost Management, Planning Cost Management, Estimating Costs, Determining the Budget, Controlling Costs	9
4.	**Quality and Human Resource Management:** Importance, Planning Quality Management, Performing Quality Assurance, Controlling Quality, Tools and Techniques for Quality Control, **Human Resource management:** Importance, keys to managing people, human resource planning, acquiring, developing and managing project team.	6
5.	**Risk management:** Importance, risk management planning, sources of risk, risk identification, qualitative and quantitative risk analysis, risk response planning, risk monitoring and control.	5
6.	**Agile Project Management:** The Genesis of Agile, Introduction and background, Agile Manifesto and Principles, Overview of Scrum, Extreme Programming, Feature Driven development, Lean Software Development, Agile project management, Design and development practices in Agile projects	4

Term Work

- It should consist of minimum 8 – 10 assignments based on the above topics.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Information Technology Project Management	Kathy Schwalbe	Cengage Learning 7E	(Unit I to V)
2	Software Project Management	Bob Huges, Mike Cotterell, Rajib Mall	McGraw Hill Edu	Unit -VI

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Effective Project Management	Robert K.Wysocki	Wiley India 7 Edition
2	Project Management Core Textbook	Mantel Jr., Meredith, Shafer, Sutton, Gopalan	Wiley India Edition
3	IT Project Management	Joseph Phillips 3E	McGraw Hill Edu.

4. Natural Language Processing (PCE- CS803) Elective-II

TEACHING SCHEME	EXAMINATION SCHEME	
Theory :3 Hrs./Week	**Theory**	**:** ESE 70 Marks CIE 30 Marks
Tutorial :1 Hrs./Week	**Term work: - 25 Marks**	
Practical : NA	**Practical : – NA**	

Course Objectives

1. To introduces the fundamental concepts and techniques of natural language processing (NLP).

2. To gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.

3. To examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Acquire the knowledge of fundamental mathematical models and algorithms in the fields of NLP

2. Apply these mathematical models and algorithms in application in software design and implementation for NLP.

3. Apply deep learning models to solve machine translation and conversation problems.

4. Apply deep structured semantic models on information retrieval and natural language applications.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction** Introduction to various levels of natural language processing, Ambiguities and computational challenges in processing various natural languages. Introduction to Real life applications of NLP such as spell and grammar checkers, information extraction, question answering, and machine translation.	6

2.	**Language Models** : The role of language models. Simple N-gram models. Estimating parameters and smoothing. Evaluating language models	6
3.	**Part Of Speech Tagging and Sequence Labeling**: Stochastic POS tagging, HMM, Transformation based tagging (TBL), Handling of unknown words, named entities, multi word expressions.	6
4.	**Syntactic parsing**: Constituency, Context-Free Grammars, Some Grammar Rules for English, Treebanks, Grammar Equivalence and Normal Form, Lexicalized Grammars.	6
5.	**Semantic Analysis**: Lexical semantics and word-sense disambiguation. Compositional semantics. Semantic Role Labeling and Semantic Parsing.	6
6.	**APPLICATIONSOFNLP:** NLInterfaces, Text Summarization, Sentiment Analysis, Machine Translation, Questionans wering, Recent Trends in NLP	6

Term Work

- It should consist of minimum 8-10 assignments with emphasis on solving exercise problems.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Speech and Language Processing	Daniel Jurafsky and James H Martin	2E, Pearson Education, 2009

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	**Natural language Understanding**	James A..	**2e, Pearson Education,1994**
2	Natural language processing: a Paninian perspective,	Bharati A., Sangat R., Chaitanya V..	**PHI, 2000**

5. Ad-Hoc Wireless Sensor Networks (PCE- CS803) Elective-II

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	**Theory** : ESE 70 Marks CIE 30 Marks
Tutorial :1 Hrs./Week	**Term work: 25 Marks**
Practical :	**Practical : NA**

Pre-requisites: Computer Network, Information Security, Modular Arithmetic & Number Theory, C / C++.

Course Objectives

1) To introduce cellular and Ad Hoc wireless networks

2) To introduce routing protocols in Ad Hoc wireless networks

3) To introduce Transport layer and security protocols for ad hoc wireless networks

4) To introduce sensor networks and its routing algorithms

5) To introduce sensor networks infrastructure and sensor tasking

Course Outcomes

On completion of the course, student will be able to-

1) Describe issues and design goals in Ad Hoc wireless networks

2) Explain and classify various routing protocols in Ad Hoc wireless networks

3) Describe design issues and classify transport layer protocols and security protocols in Ad Hoc wireless

Networks

4) Describe challenges and routing protocols in sensor networks

5) Explain sensor networks infrastructure management and sensor tasking and control techniques

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction** Cellular and Ad Hoc wireless networks, Applications, Issues in Ad Hoc wireless networks, MAC Protocols for ad hoc wireless networks – Introduction, Issues in designing MAC protocol, Design goals of MAC protocol, Classification of	**6**

	MAC protocols, Contention based protocols.	
2.	**Routing protocols for ad hoc wireless networks** Introduction, Issues in designing a routing protocol for ad hoc wireless networks, Classification of routing protocols, Table driven, on-demand Hybrid routing protocols, Issues in designing a multicast routing protocol, Operation of multicast routing protocols, An architecture reference model for multicast routing protocols, Classification of multicast routing protocols.	7
3.	**Transport layer and security protocols for ad hoc wireless networks** Introduction, Design issues and goals, Classification of transport layer solutions, TCP over ad hoc wireless Networks, Security in ad hoc wireless networks, Network security requirements, Issues and challenges in security provisioning, Network security attacks, Key management, Secure routing.	6
4.	**Introduction to Sensor Networks** Unique Constraints and Challenges, Advantages of Sensor Networks, Sensor Network Applications, Medium Access Control, The S-MAC Protocol, IEEE 802.15.Standard and ZigBee: General Issues.	6
5.	**Routing Protocol for Sensor Network** Geographic, Energy-Aware Routing , Unicast Geographic Routing , Routing on a Curve , Energy-Minimizing Broadcast , Energy-Aware Routing to a Region , Attribute-Based Routing , Directed Diffusion , Rumor Routing , Geographic Hash Tables	6
6.	**Sensor Network Infrastructure Establishment** Topology Control , Clustering , Time Synchronization , Clocks and Communication Delays, Interval Methods, Reference Broadcasts, Localization and Localization Services, Ranging Techniques , Range-Based Localization Algorithms, Other Localization Algorithms, Location Services.	7

Term Work

Term work includes combination of written assignments, getting acquainted with wireless simulationtools and performing experiments from Virtual Lab portal of IIT, Bombay.
1) One assignment from each unit (Total 6 written assignments)

2) Faculty should demonstrate any open source wireless network simulator tool (ns-2, ns-3, GNS3, etc.) with installation, configuration and demonstration of some scenarios of WSNs.

3) Virtual Lab :- Performing 4 Assignments from Wireless Sensor Network Remote Triggered Lab (Wireless Remote Sensing, Experimentation, Monitoring and Administration Lab) from IIT Bombay

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Ad Hoc wireless Networks– Architecture and Protocols	C.S.R.Murthy& B.S. Manoj	Pearson Education	(Unit I to III)
2	Wireless sensor networks	Feng Zhao and LeonidesGuibas	Elsevier publication - 2004	(Unit –IV to VI)

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Ad Hoc Wireless Networks- A communication Theoretic perspective	O.K.Tonguz & G.Ferrari,	Wiley India
2	Ad Hoc Networking	Charles E. Perkins	Pearson Education
3	Ad Hoc Mobile Wireless Networks – Protocols and Systems	C. K. Toh	Pearson Education
4	Wireless Communications and Networks	William Stallings	Pearson Education – 2004
5	Introduction to Wireless and Mobile Systems, 2nd Edition,	Dharma Prakash Agrawal & Qing-An Zeng	CENGAGE Learning

6. High Performance Computing (PCE- CS804) Elective-III

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	**Theory** : ESE 70 Marks
Tutorial : 1 Hrs./Week	CIE 30 Marks
Term Work: 25 Marks	**Practical:** -

Pre-requisites: 1. Computer Organization 2. Computer Algorithms

Course Objectives

1. To introduce the current trends in computer architecture and programming model.

2. To understand Parallel Hardware and Parallel Software.

3. To learn Distributed-Memory Programming with MPI.

4. To learn Shared-Memory Programming with Pthreads.

5. To learn Shared-Memory Programming with OpenMP.

6. To solve basic parallel problems.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. To introduce the current trends in computer architecture and programming model.

2. To explain Parallel Hardware and Parallel Software.

3. To apply and use Distributed-Memory Programming with MPI.

4. To apply and use Shared-Memory Programming with Pthreads.

5. To apply and use Shared-Memory Programming with OpenMP.

6. Program parallel architectures.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction** Need of Ever-Increasing Performance, Building Parallel Systems, Need to Write Parallel Programs, Concurrent, Parallel, Distributed, Typographical Conventions, Cluster Computing - architecture, Classifications, Grid Computing - Architecture, Applications	6
2.	**Parallel Hardware and Parallel Software** Modifications to the von Neumann Model, Parallel Software, Input and Output, Performance, Parallel Program Design, Writing and Running Parallel Programs	5
3.	**Distributed-Memory Programming with MPI** Compilation and execution, MPI programs, SPMD programs, The Trapezoidal Rule in MPI, Dealing with I/O, Tree-structured communication, MPI Reduce, Collective vs. point-to-point communications, MPI Allreduce, Broadcast, Data distributions, MPI Derived Datatypes, Performance Evaluation of MPI Programs	6
4.	**Shared-Memory Programming with Pthreads** Processes, Threads, and Pthreads, Hello World, Matrix-Vector Multiplication, Critical Sections, Busy-Waiting, Mutexes, Producer-Consumer Synchronization and Semaphores, Barriers and Condition Variables	6
5.	**Shared-Memory Programming with OpenMP** Compiling and running OpenMP programs, The program, The Trapezoidal Rule, Scope of Variables, The Reduction Clause, The parallel forDirective, More About Loops in OpenMP: Sorting, Scheduling Loops	6
6.	**Parallel Program Development** Two *n*-Body Solvers, Recursive depth-first search, Nonrecursive depth-first search, Data structures for the serial implementations, Performance of the serial implementations, Parallelizing tree search, A static parallelization of tree search using Pthreads, A dynamic parallelization of tree search using Pthreads, Evaluating the pthreads tree-search programs	7

Term Work

- Term Work should consist of 10 assignments based on the following list. At least one assignment must be from each unit.

1. Write a short note on significance of parallel programming to enrich the computational performance.

2. Enumerate the fundamental prerequisites of parallel programming.

3. Explain the modified architecture of von Neumann model.

4. Describe parallel program design with running process.

5. Explain the Trapezoidal rule in MPI.

6. How the evaluation for performance of MPI is done?

7. What is Pthread? Write a note on Pthread creation, finish. Explain Pthread API.

8. Explain: a) Mutexes b) barriers c) busy waiting

9. Explain the following terms with respect to OpenMp

    a. The trapezoidal rule

    b. Scope of the variable

10. Explain various loops in OpenMp with example.

11. Write short note on two n-body solvers.

12. Write dawn Difference between Recursive depth - first search and Non Recursive depth - first search

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	An Introduction to Parallel Programming	Peter S. Pacheco	Elsevier, 2011	1 to 6
2	Introduction to Grid Computing	Bart Jacob, Michael Brown, Kentaro Fukui, NiharTrivedi	International Business Machines Corporation 2005.	Grid Computing Unit 1
3	High Performance Cluster Computing: Architectures and Systems, Volume 1	R. Buyya	Pearson Education, 2008	Cluster Computing Unit 1

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Parallel computing theory and practice	Michel J. Quinn	TMH
2	Computer Architecture & Parallel Processing	Kai Hwang & Briggs	McGraw Hill
3	Parallel and Distributed Systems	Arun Kulkarni, Napur Prasad Giri	Wiley Publications, 2nd Edition

7. Block chain Technology (PCE- CS804) Elective-III

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	**Theory : ESE 70 Marks** CIE 30 Marks
Tutorial : 1 hr/Week	**Term work: 25 Marks**
Practical :	**Practical :**

Pre-requisites: Expertise In Programming, Basic Knowledge Of Computer Security, Cryptography,Networking, Concurrent Or Parallel Programming

Course Objectives

1) Understand how blockchain systems (mainly Bitcoin and Ethereum) work

2) To securely interact with bitcoin and ethereum

3) Design, build, and deploy smart contracts and distributed applications

4) Integrate ideas from blockchain technology into their own projects

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Explain design principles of Bitcoin and Ethereum.

2. Explain Nakamoto consensus.

3. Explain the Simplified Payment Verification protocol.

4. List and describe differences between proof-of-work and proof-of-stake consensus.

5. Interact with a blockchain system by sending and reading transactions.

6. Design, build, and deploy a distributed application.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction** Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.	6
2.	**Blockchain** Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain	7
3.	**Distributed Consensus**: Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, SybilAttack, Energy utilization and alternate.	6
4.	**Cryptocurrency**: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum -Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin	8
5.	**Cryptocurrency Regulation**: Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy.	8
6.	**Cryptocurrency Applications:** Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain	5

Term Work

Tutorials: Naive Blockchain construction, Memory Hard algorithm – Hashcash implementation, Direct Acyclic Graph, Play with Go-ethereum, Smart Contract Construction,Toy application using Blockchain, Mining puzzles

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder,	Princeton University Press (July 19, 2016).	

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	'Blockchain Technology: Cryptocurrency and Applications	S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan	Oxford University Press, 2019.
2	Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming	Josh Thompson	Create Space Independent Publishing Platform, 201

8. Human Computer Interaction (PCE- CS804) Elective-III

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	**Theory** **:** ESE 70 Marks CIE 30 Marks
Tutorial :1 Hrs./Week	**Term work: 25 Marks**
Practical : --	**Practical : --**

Pre-requisites: Web Technologies, Software Engineering, Basic knowledge of designing tools and languages like HTML, Java etc.

Course Objectives

1. To learn Human Computer Interaction study.

2. To learn human computer interface design

3. To learn Screen designing techniques

4. To learn Windows based UI interfaces

5. To learn Design and Development of Mobile Applications.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Explain principles of User Interface

2. Demonstrates HCI design process

3. Demonstrate screen designing techniques

4. Apply windows based UI interfaces

6. Design and Develop Mobile Applications

Unit No.	Unit Name and Details	No. of Lectures
1	**Importance of user Interface** Definition, Importance of good design - Benefits of good design. A brief history of Screen design, The graphical user interface popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user - Interface popularity, characteristics- Principles of user interface.	6

2	**Understanding Clients and Business Functions** Human interaction with computers Importance of human characteristics Human consideration Human Interaction speeds Understanding business Functions.	6
3	*I*nterface and Screen Design Screen and Web Page Meaning and Purpose Organizing Elements Clearly and Meaningfully Ordering of Data and Content, Navigation and Flow Visually Pleasing Composition, Focus and Emphasis Presenting Information Simply and Meaningfully Technological Considerations in Interface Design – Graphical Systems and Web Systems	8
4	**Windows** Windows Characteristics Components of Windows Window Presentation Styles Types of Windows Organizing Windows Functions The Web and the Browser	6
5	**Mobile Applications and Information Architecture** Mobile application medium types – SMS, Mobile Websites, Mobile Web Widgets, Mobile Web Applications, Native Applications, Games, Mobile Application Media Matrix, Application Context, Utility Context,Locale Context, Informative Applications, Productivity Application Context, Immersive Full-Screen Applications, Application Context Matrix Information Architecture Introduction, Mobile Information Architecture.	6
6	**Mobile Design and Communication** Elements of Mobile Design, Mobile Design Tools, Designing for the Right Device, Designing for Different Screen Sizes. Mobile Web Development – Web Standards, Designing for Multiple Mobile Browsers, Device Plans, Mark-up, CSS, JavaScript	4

Term Work

Term Work should consist of 8-10 assignments based on topics of syllabus.
Students should Design two Interactive UI, one for Desktop Application and One for Mobile Application, using any of the software tool like HTML, CSS, java etc.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
01	The essential guide to user interface design	Wilbert O Galitz	2nd Edition; Wiley Dream Tech, 2002.	1,2,3,4
02	Mobile Design and Development	Brian Fling	O'Reilly,	5,6

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
01	Human - Computer Interaction	Alan Dix	3rd Edition; Pearson Education, 2003
02	Designing the user interface	Ben Shneidermann	3rd Edition; Pearson Education, 2009.
03	Interaction Design	Prece, Rogers and Sharps	3rd Edition; Wiley DreamTech, 2011.
04	User Interface Design	SorenLauesen	Pearson Education, 2005
05	Human -Computer Interaction	D. R. Olsen	1st Edition; Cengage Learning, 2009

9. Mobile application development (PCC- CS805)

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	**Theory :**
Tutorial :	**Term work: 50 Marks**
Practical : 4 Hrs./Week	**POE : 50 Marks**

Pre-requisites: Java and XML.

Course Objectives

1. To describe android architecture and the tools for developing android applications.

2. To create an android application.

3. To design the user interfaces used in android applications

4. To deploy android application on app market.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. To Install and configure Android application development tools.

2. To Design and develop user Interfaces for the Android platform.

3. To Design and develop database based android application.

4. To Apply Java programming concepts to Android app development

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Android Overview:** Overview of Android, History, Android Versions, Android OS stack: Linux kernel, Native Libraries/DVM, Application Framework, Applications, Activity, Activity lifecycle, Fragments, Activity Back Stack, Process and Threads. **Android Development Environment** Introduction to Android SDK, Android Emulator, Creating a Project, Project Directory Structure, DDMS, Logging in Android (Logcat), Android Manifest File, Permissions.	8
2.	**Intents and Layouts:** XML, Android View Hierarchies, Linear Layouts, Relative Layout, Table Layout, Frame Layout Sliding, Using Padding and Margins with Layouts. What Is Intent? Android Intent Messaging via Intent Objects, Types of Intents, Using Intents with Activities, Sending Intents (Telephony, SMS), Broadcast Receivers	4
3.	**Input Controls, Input Events, Dialogs:** Buttons, Text Fields, Checkboxes, Radio Buttons, Toggle Buttons, Spinners, Event Listeners, Event Handlers, Touch Mode, Handling Focus, Dialogs: Alerts, Popups, Toasts	4
4.	**Menus, Notification and Action Bar:** Menus, Options menu, Context menu, Popup menu, Handling menu click events, creating a Notification, Notification actions, Notification priority, Managing Notifications, Removing notifications.	4
5.	**Android Database and App Market:** Installing SQLite plugin, Db Helper, The Database Schema and Its Creation, Four Major Operations, Cursors, Example, publish app to the Android Market.	4
6.	**Using Common Android APIs**: Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs.	4

Term Work

- Minimum of 15 Experiments to be performed from the list given below.
- 25 marks for performance in practical and experiments as part of continuous evaluation
- 25 marks for Practical Test and oral to be conducted.

Experiment List

01. Installation of Android SDK, emulator.

02. Creating simple project and study of android project structure and installing apk on mobile device/tablet, configuring mobile device/tablet in Android Studio with developer option and running app directly on mobile device/tablet.

03. Write a program to use of different layouts.

04. Write a program to study Intents for switching between activities.

05. Write a program to use of Intents for SMS and Telephony.

06. Write a program to study and demonstrate Broadcast Receiver.

07. Program to demonstrate Buttons, Text Fields, Checkboxes, Radio Buttons, and Toggle Buttons with their events handler.

08. Program to demonstrate Spinners, Touch Mode, Alerts, Popups, and Toasts with their events handler.

09. Program to demonstrate Touch Mode, Menus with their events handler.

10. Program to demonstrate notification with their action.

11. Develop a native calculator application.

12. Implement an application that writes data to the SD card.

13. Write a mobile application that creates alarm clock.

14. Implement an application that implements Multi-threading

15. Write a program to study and use of SQLite database.

16. Study of publishing app to the Android Market.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Beginning Android application development by	Wei-Mag Lee	

2	Learning Android by Marko Gargenta Publisher	W. Jason Gilmore	O'Reilly Media
3	Android Apps for Absolute Beginners	Wallace Jackson	SECOND EDITION
4	T1., "Android Wireless Application Development"	Lauren Darcey and Shane Conder	Pearson Education,2nd ed.

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Application Development	Reto Meier	Wiley India
2	Android in Action	W.FrankAbleson, RobiSen, Chris King, C. Enrique Ortiz	Third Edition
3	The Android Developer's Cook book "Building Applications with the Android SDK"	James Steele	
4	Beginning Android	Mark L Murphy	Wiley India Pvt Ltd
5	Android Application Development All in one for Dummies	Barry Burd	Edition: I

10. Project-II (PW- CS806)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : NA	Theory : NA
Tutorial : NA	Term work: 50 Marks
Practical : 4 Hrs./Week	Demo & OE : 50 Marks

Pre-requisites: Project - I.

Course Objectives

1. Students should learn to design and develop usable User Interface

2. Students should learn to analyze and apply emerging technologies in development of a project

3. Students should learn to test the modules in Project

4. Students should learn to demonstrate working of project

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Design and develop usable User Interface

2. Analyze and apply emerging technologies in development of a project

3. Test the modules in Project

4. Demonstrate working of project

Contents

The group will continue to work on the project selected during the semester VII and submit the completed

Project work to the department at the end of semester VIII as mentioned below.

1. The workable project.

2. The project report in the bound journal complete in all respect with the following : -

     i. Problem specifications

     ii. System definition – requirement analysis.

     iii. System design – dataflow diagrams, database design

     iv. System implementation – algorithm, code documentation

     v. Test results and test report.

     vi. In case of object oriented approach – appropriate process be followed.

CIE will be jointly assessed by a panel of teachers appointed by head of the Institution. SEE examination will

be conducted by internal and external examiners

Note:

1. Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.

2. Two mid-term evaluations should be done, which includes presentations and demos of the work done.

3. Care should be taken to avoid copying and outsourcing of the project work

11. Professional Skills (HM-CS807)

TEACHING SCHEME	EXAMINATION SCHEME
Theory :NA	**Theory :**NA
Tutorial :1 Hr. /Week (1 Credit)	**Term work: 50 Marks**
Practical :NA	**Mode of Evaluation: Based on Term Work Activities.**

Pre-requisites: Effective English Communication, Report Writing Skills, Technical Skills.

Course Objectives

1. To increase one's knowledge and awareness of emotional competency and emotional intelligence at place of study/work.

2. To develop interpersonal skills and adopt good leadership behavior for empowerment of self and others.

3. To set appropriate goals, manage stress and time effectively.

Course Outcomes

At the end of the program learners will be able to:
1. Recognize own strengths and opportunities.

2. Apply the life skills to different situations.

3. Speak fluently in academic and social contexts.

4. Develop Critical thinking and innovative skills.

Syllabus

I. E-Learning Course
Students are supposed to complete e-learning course from any online platforms like MOOCS/NPTEL/Swayam/Coursera/Udemy etc. related to Project work or advanced technologies. Duration of the Course should be minimum 4 weeks.
At the end of course students are advised to attend the exam and get the certificate for the same.

II. Professional Skills: Career Skills
1. Resume Skills
2. Interview Skills / Online Interview

3. Group Discussion Skills
4. Exploring Career Opportunities

III. Professional Skills: Team Skills
1. Presentation Skills
2. Trust and Collaboration
3. Brainstorming
4. Social and Cultural Etiquettes
5. Internal Communication
6. Social Media Profile Building

IV. Leadership and Management Skills
1. Leadership Skills
2. Managerial Skills
3. Time Management
4. Entrepreneurial Skills
5. Innovative Leadership and Design Thinking
6. Ethics and Integrity

V. Introduction to Critical Life skills

Leadership, teamwork, dealing with ambiguity, managing stress, motivating people, creativity, result orientation; Understanding Life Skills: Movie based learning, Self-awareness- identity, body awareness, stress management; building self-confidence; Importance of listening skills, Difference between listening and hearing, Types of listening.

Term Work

1. Students are expected to learn new application areas, enhance technical skills, and build their profile by completing E-Learning Course.
2. Prepare their resume in an appropriate template without grammatical and other errors and using proper syntax.
3. Participate in a simulated interview.
4. Actively participate in group discussions towards gainful employment.
5. Capture a self - interview simulation video regarding the job role concerned.
6. Enlist the common errors generally made by candidates in an interview.
7. Perform appropriately and effectively in group discussions.
8. Explore sources (online/offline) of career opportunities.
9. Identify career opportunities in consideration of their own potential and aspirations.
10. Use the necessary components required to prepare for a career in an identified occupation (As a case study).

Based on above activities respective guide should assess the performance of the students out of 50marks.

Learning Resources

Text Books

1. Lewis Lansford and Peter Astley. Oxford English for Careers: Engineering 1: Student's Book.2013. USA: Oxford University Press.
2. Jaimie Scanlon. Q: Skills for Success 1 Listening & Speaking. 2015. [Second Revised Edition]. Oxford: Oxford University Press.

Reference Books:

1. Sanjay Kumar and Puspalata. Communication Skills. 2015. [Second Edition] Print. NewDelhi: Oxford University Press.
2. John Seely. Oxford Guide to Effective Writing and Speaking. 2013. [Third Edition].NewDelhi: Oxford University Press.
3. Meenakshi Raman. Communication Skills. 2011. [Second Edition]. New Delhi: Oxford University Press.
4. Terry O"Brien. Effective Speaking Skills. 2011. New Delhi: Rupa Publishers.
5. BarunMitra. Effective Technical Communication: AGuide for Scientists and Engineers. 2015.New Delhi: Oxford University Press.
6. English vocabulary in use – Alan Mc'carthy and O'dell
7. APAART: Speak Well 1 (English Language and Communication)
8. APAART: Speak Well 2 (Soft Skills)
9. Business Communication – Dr. Saroj Hiremath

Web References:

1 Train your mind to perform under pressure- Simon sinek
https://curiosity.com/videos/simon-sinek-on-training-your-mind-to-perform-underpressure-capture-your-flag/
2 Brilliant way one CEO rallied his team in the middle of layoffs https://www.inc.com/video/simon-sinek-explains-why-you-should-put-people-beforenumbers.html3 Will Smith's Top Ten rules for success https://www.youtube.com/watch?v=bBsT9omTeh0

Online Resources:

1 https://www.coursera.org/learn/learning-how-to-learn
2 https://www.coursera.org/specializations/effective-business-communication

TEACHINGPLAN

Class : Final Year B.Tech   Sem. : II

Subject: **Mobile Application Development**

	Practical	Tut	Total

◄ Lecture Plan   ►

Lect. No.	Details of syllabus planned
Android Overview
01	Overview of Android, History, Android Versions,
02	Android OS stack: Linux kernel,
03	tive Libraries/DVM, Application Framework,
04	plications, Activity, Activity lifecycle, Fragments,
05	tivity Back Stack, Process and Threads.
06	Introduction to Android SDK, Android Emulator, Creating a Project,
07	bject Directory Structure, DDMS, Logging in Android (Logcat),
08	Android Manifest File, Permissions
	Intents and Layouts
09	ML, Android View Hierarchies, Linear Layouts, Relative Layout, Table Layout,
10	ame Layout Sliding, Using Padding and Margins with Layouts.
11	hat Is Intent? Android Intent Messaging via Intent Objects, Types of Intents,
12	Using Intents with Activities, Sending Intents (Telephony, SMS), Broadcast Receivers
	Input Controls, Input Events, Dialogs
13	ttons, Text Fields, Checkboxes, Radio Buttons,
14	ggle Buttons, Spinners, Event Listeners,
15	ent Handlers, Touch Mode, Handling Focus,
16	Dialogs: Alerts, Popups, Toasts,
	Menus, Notification and ActionBar
17	enus, Options menu, Context menu, Popup menu,
18	Handling menu click events, creating a Notification,
19	tification actions, Notification priority, Managing Notifications,
20	Removing notifications
	Android Database and App Market

UNIT No.	Lect. No.	Details of syllabus planned
		# Using Common Android APIs
	25	aring Data between Applications with Content Providers,

	06	26	ing Android Networking APIs,
		27	ing Android Web APIs,
		28	ing Android Telephony APIs

Dept Of Computer Science and Engineering (TYB-TechSemII2022-23) Lecture Plan-Complier construction	
Lecture No	**Unit1:Introduction of Blockchain Technology**
01	Distributed Database, Two General Problem
02	Byzantine General problem and Fault Tolerance,
03	Hadoop Distributed File System
04	Distributed Hash Table, ASIC resistance, Turing Complete.
05	Cryptography: Hash function, Digital Signature – ECDSA
06	Memory Hard Algorithm, Zero Knowledge Proof.
	Unit2:Blockchain
	Introduction, Advantage over conventional distributed database
07	Blockchain Network, Mining Mechanism
08	Distributed Consensus, Merkle Patricia Tree, Gas Limit
09	Transactions and Fee, Anonymity, Reward
10	Chain Policy
11	Life of Blockchain application
12	Soft &HardFork, Privateand Public blockchain
13	Naive Blockchain construction
	Unit 3: Distributed Consensus
14	Nakamoto consensus
15	Proof of Work,
18	Proof of Stake
19	Proof of Burn
20	Difficulty Level, Sybil Attack,
21	Energy utilization and alternate.
	Unit 4Cryptocurrency:
22	History, Distributed Ledger
23	Bitcoin protocols
24	Mining strategy
25	Ethereum –Construction
26	DAO
27	Smart Contract ,GHOST, Vulnerability, Attacks,
28	Sidechain
	Unit5Cryptocurrency Regulation:
29	Stakeholders
30	Stakeholders
31	Roots of Bit coin
32	Roots of Bit coin
33	Legal Aspects-Crypto currency Exchange
34	Legal Aspects-Crypto currencyExchange
35	Black Market and Global Economy.

36	Black Market and Global Economy
	Unit6CryptocurrencyApplications
37	Internet of Things
38	Internet of Things
39	Medical Record Management System
40	Domain Name Service

41	future of Block chain
42	Toy application using Blockchain

Dept Of Computer Science and Engineering (TYB-TechSemII2022-23) Lecture Plan-Complier construction	
Lecture No	**Unit1:Introduction of complier construction**
01	Introduction of complier constructor.
02	The Analysis –Synthesis Model Of compilation
03	Introduction of phases of complier
04	Compiler construction Tools
05	cousins of the compiler
	Unit2:Lexical Analysis
06	Introduction of Lexical Analysis
07	Role of a Lexical analyzer
08	Introduction of input buffering
09	Specification and recognition of tokens
10	finite automata implications
11	designing a lexical analyser generator
	Unit 3: Syntax Analysis
12	Role of Parser
13	Writing grammars for context free environments
14	Top-down parsing
15	Recursive descent and predictive parsers (LL)
18	Bottom-Up parsing
19	Operator precedence parsing, LR, SLR and LALR parsers
20	YACC [Yet Another Compilers Compiler
	Unit 4: Syntax Directed Translation and Intermediate Code
21	Syntax directed definitions
22	construction of syntax tree
23	S-attributed definitions
24	L-attributed definitions
25	Intermediate languages
26	Assignment statements
27	Back patching
	Unit5: Code Optimization:
28	Principle sources of optimization
26	Principle sources of optimization
27	optimization of Basic Blocks
28	Loops in flow graphs
29	Peephole optimization Signals
30	Principle sources of optimization
	Unit6: Code Generation
31	Issues in design of a code generator and target machine
32	Run time storage management
33	Basic blocks and flow graphs
34	Next use information and

35	simple code generator
36	Issues of register allocation,
37	Code generation from Dags.

Class : Final Year B. Tech   Sem.: II

Subject: **Natural Language Processing**

Name of Faculty: Prof. P. S. Pathak

Lecture	Practical	Tut	Total
03	----	01	04
Theory	T/W	POE	T. Marks
100	25	----	125

◄   Lecture Plan   ►

UNIT No.	Lect. No.	Details of syllabus planned
		Introduction
	01	Introduction to various levels of natural language processing,
	02	Ambiguities and computational challenges in processing various natural languages,
01	03	Introduction to Real life applications of NLP such as spell and grammar checkers,
	04	Information extraction,
	05	Question answering and.
	06	Machine translation.
		Language Models
	07	The role of language models,
	08	Simple N-gram models,
02	09	Estimating parameters and smoothing,
	10	Evaluating language models.
	11	Evaluating language models,
	12	Evaluating language models.
		Part Of Speech Tagging and Sequence Labelling
	13	Stochastic POS tagging,
	14	HMM,
03	15	Transformation based tagging (TBL),
	16	Handling of unknown words,
	17	Named entities,
	18	Multi word expressions.
		Syntactic parsing
	19	Constituency,
	20	Context-Free Grammars,
04	21	Some Grammar Rules for English,
	22	Treebanks,
	23	Grammar Equivalence and Normal Form,
	24	Lexicalized Grammars.

UNIT No.	Lect. No.	Details of syllabus planned
		Semantic Analysis
05	25	Lexical semantics and word-sense disambiguation,
	26	Lexical semantics and word-sense disambiguation,
	27	Compositional semantics,
	28	Compositional semantics,
	29	Semantic Role Labelling and Semantic Parsing,
	30	Semantic Role Labelling and Semantic Parsing.
		APPLICATIONSOFNLP
06	25	NLInterfaces,
	26	TextSummarization,
	27	SentimentAnalysis,MachineTranslation,
	28	Questionanswering,
	29	Recent Trends in NLP,
	30	Recent Trends in NLP.

Class : B Tech..CSE.   Sem.; II

Subject: **Deep Learning**

Name of Faculty: Prof. P. S. Ambupe

Lecture	Practical	Tut	Total
03	---	01	--
Theory	T/W	POE	T. Marks
100	25	-	125

≺ Lecture Plan ≻

UNIT No.	Lect. No.	Details of syllabus planned
		Neural Network and Deep Learning
01	1	Introduction to AI, ML and Deep Learning.
	2	A brief history
	3	Need of Deep Learning
	4	Basics of neural network
	5	Data representation for neural network
	6	Gradient based optimization
	7	Anatomy of neural network.
		Introduction to Tensorflow, Keras and hyperparameters
02	1	Introduction, Downloading and installation of Tensor flow, The computation graph
	2	Modelling cyclic dependencies, Building and running visualization
	3	Computing graph and distribution, Simple math operation and distribution
	4	Tensors, Rank of tensors, Tensormath, Numpy and tensors, Tensorflow example
	5	Introduction, Models, Layers, Pre-processing, Deep Learning case studies,
	6	Learning rate, No of iterations, Hidden layers, hidden units, Choice of P activation function,
	7	Momentum, mini batch size, Overfitting and underfitting, Regularization
		Convolutional Neural Networks
03	1	The convolutional operation.
	2	The max pooling operation.
	3	Training a convnet from scratch on a small dataset.
	4	Using pre-trained convnet.
	5	Visualizing what convnet learn
	6	Visualizing what convnet learn
	4	Hardwired control
	5	Hardwired control
	6	Micro programmed Control

UNIT No.	Lect. No.	Details of syllabus planned
		Sequence Models
04	1	One hot encoding,
	2	Using word embeddings,
	3	A recurrent layer in Keras,
	4	Understanding the LSTM and GRU layers,
	5	Example of LSTM in Keras,
	6	Advanced use of Recurrent Neural Network
		Advanced Deep Learning Best Practices
05	1	.Going beyond the sequential model:
	2	The Keras functional API,
	3	Inspecting and monitoring deep learning
	4	models using Keras callbacks and Tensor Board,
	5	Getting the most out of your models
		Generative Deep Learning
06	1	Text generation with LSTM,
	2	Deep Dream,
	3	Neural Style Transfer,
	4	Generating images with variational auto encoders,
	5	Introduction to generative adversarial network.

Date: 02/02/2023.

Project/Seminar

U.G .Students Project Schedule

Sr. No.	Activity	Tentative date of year
Semester-I		
01	Submission of Project topics with name of group members, Submission of synopsis with guide's signature	19/07/2025 29/07/2025
02	**Presentation-I :** Synopsis Presentation in front of DRC	2/08/2025
03	**Presentation-II:** Presentation on Introduction and literature review of the project	21/09/2024
04	**Presentation-III:** Presentation of Methodology and future work of project.	17/11.2025
05	Guide Marks & Teamwork Marks Finalization	**20/11/2025**
Semester–II		
06	**Progress Presentation-I**	17/1/2026
07	**Progress Presentation-II**	27/2/2026
08	**Final Presentation and Submission of final report**	4/4/2026
09	**Guide marks and Term work Finalization**	15/4/2026

U.G. Students Project Marking Scheme

Sr. No.	Activity	Marks
Semester - I		
01	Submission of project topic with names of group member	$A1 = 0.08 \times$ TM1
02	Submission of synopsis duly signed by students and guide	$A2 = 0.08 \times$ TM1
03	Introduction and literature review presentation	$A3 = 0.24 \times$ TM1
04	Methodology and future work presentation	$A4 = 0.30 \times$ TM1
05	Guides mark	$A5 = 0.30 \times$ TM1
Semester – II		
06	Progress presentation 1	$A6 = 0.20 \times$ TM2
07	Progress presentation 2	$A7 = 0.20 \times$ TM2
08	Final presentation before DRC along with submission of spiral bound copy	$A8 = 0.30 \times$ TM2
09	Guides mark	$A9 = 0.30 \times$ TM2

Notes: -

1. TM1 = Total term work marks allotted by SUK for project work in semester I.
2. TM2 = Total term work marks allotted by SUK for project work in semester II.
3. Distribution of marks is given in form of multiplying factor.

4. Round up or down the marks to get the whole number as per requirement.

5. In rubrics also distribution of marks is given in form of multiplyingfactor.

U.G. Students Project Rubric for Marking Scheme of Semester – I

Level ⟹ Activity ⬇	Unsatisfactory	Developing	Satisfactory	Excellent
Submission of project topic with names of group member	Submitted after scheduled date. $(0.0 \times A1)$	Submitted on scheduled date, but without clear title. $(0.4 \times A1)$	Submitted before scheduled date with clear title. $(0.8 \times A1)$	Submitted well before scheduled date with research based title. $(1.0 \times A1)$
Submission of synopsis duly signed by students and guide	Submitted after scheduled date, copied topic. $(0.0 \times A2)$	Submitted on scheduled date, duly signed by group members and Guide. Copied topic but added own value. $(0.4 \times A2)$	Submitted before scheduled date duly signed by group members and Guide. Sufficient number of references. Filling gap of existing work. $(0.8 \times A2)$	Submitted well before scheduled date duly signed by group members and Guide. Sufficient number of references. Innovative idea. $(1.0 \times A2)$
Introduction and Literature review presentation	Presented after scheduled date. No coordination between group members. No collection of literature. $(0.25 \times A3)$	Presented on scheduled date. Poor coordination between group members. Little collection of literature. $(0.60 \times A3)$	Presented on scheduled date. Good coordination between group members. Sufficient collection of literature. $(0.85 \times A3)$	Presented on scheduled date. Excellent coordination between group members. Full collection of literature. Presented

Level ⟹ Activity ⬇	Unsatisfactory	Developing	Satisfactory	Excellent
				novel idea. (1 × A3)
Methodology and future work presentation	Presented after scheduled date. No coordination between group members. Little idea about methodology, future work and conclusion. (0.25 × A4)	Presented on scheduled date. Poor coordination between group members. Clear about methodology and future work, but no clear idea about conclusion. (0.6 × A4)	Presented on scheduled date. Good coordination between group members. Clear about methodology, future work and conclusion. (0.9 × A4)	Presented on scheduled date. Excellent coordination between group members. Clear about methodology and future work. Confident about conclusion. (1 × A4)
Guides mark	Not reporting regularly. Reporting individually. Unable to explain. (0.25 × A5)	Reporting regularly and in group. Partially explaining, need guides' help. (0.6 × A5)	Reporting regularly and in group. Fully explaining without guides' help. (0.9 × A5)	Reporting regularly and in group. Fully explaining with clear concepts. (1 × A5)

U.G. Students Project Rubric for Marking Scheme of Semester – II

Level ➡ Activity ⬇	Unsatisfactory	Developing	Satisfactory	Excellent
Progress presentation 1	Presented after scheduled date. No coordination between group members. No progress. $(0.2 \times A6)$	Presented on scheduled date. Poor coordination between group members. Little progress. $(0.65 \times A6)$	Presented on scheduled date. Good coordination between group members. Satisfactory progress. $(0.9 \times A6)$	Presented on scheduled date. Excellent coordination between group members. Excellent progress. $(1 \times A6)$
Progress presentation 2	Presented after scheduled date. No coordination between group members. No progress. $(0.2 \times A7)$	Presented on scheduled date. Poor coordination between group members. Little progress. $(0.65 \times A7)$	Presented on scheduled date. Good coordination between group members. Satisfactory progress. $(0.9 \times A7)$	Presented on scheduled date. Excellent coordination between group members. Excellent progress. $(1 \times A7)$

Level ➡ Activity ⬇	Unsatisfactory	Developing	Satisfactory	Excellent
Final presentation before DRC along with submission of spiral	Presented after scheduled date. No coordination between group members. No	Presented on scheduled date. Poor coordination between group members.	Presented on scheduled date. Good coordination between group	Presented on scheduled date. Excellent coordination between

bound copy	submission of spiral bound. Lack of info. Poor format and poor grammar in presentation. Work done not as per submitted synopsis. (0.25 × A8)	Submitted spiral bound. Little info. Poor format and poor grammar in presentation. (0.7 × A8)	members. Submitted spiral bound. Sufficient info. Perfect format, but poor grammar in presentation. (0.95 × A8)	group members. Submitted spiral bound. Lot of info. No mistake in presentation. (1 × A8)
Guides mark	Not reporting regularly. Reporting individually. Unable to explain. Final bound submitted after scheduled date. (0.25 × A9)	Reporting regularly and in group. Partially explaining, need guides' help. Final bound submitted on scheduled date. (0.7 × A9)	Reporting regularly and in group. Fully explaining without guides' help. Final bound submitted before scheduled date. (0.95 × A9)	Reporting regularly and in group. Fully explaining with clear concepts. Final bound submitted well before scheduled date. (1 × A9)

EXPERIMENT LIST AND ASSIGNMENT LIST

Subject : Compiler construction

Experiment List

Expt No.	Name of the Experiment	Nature of Experiment
1.	Design of Pre-processor for C Program	Performing
2.	Design a complete lexical analyzer for C language.	Performing
3.	Program to create a symbol table generator	Performing
4.	Program for token separation with expression and Token separation with file	Performing
5.	Write a program to find first and follow in context free grammer.	Performing
6.	Design a syntax for simple expression in c language using top down parsing.	Performing
7.	Implementation of recursive descent parsing.	Performing
8.	Write a program for shift reduce Paring.	Performing
9.	Implement bottom up parsing (SLR, LALR)	Performing
10.	Implement intermediate code Generation of three address code in C programming	Performing

EXPERIMENT LIST
Mobile Application Development
Academic Year 2025-26 SEM-II

Exp. No.	Name of Experiment
01	Installation of Android SDK, emulator.
02	creating simple project and study of android project structure and installing apk on mobile device/tablet, configuring mobile device/tablet in Android Studio with developer option and running app directly on mobile device/tablet.
03	write a program to use of different layouts.
04	Write a program to study Intents for switching between activities.
05	Write a program to use of Intents for SMS and Telephony.
06	Write a program to study and demonstrate Broadcast Receiver.
07	Program to demonstrate Buttons, Text Fields, Checkboxes, Radio Buttons, and Toggle Buttons with their events handler.
08	Program to demonstrate Spinners, Touch Mode, Alerts, Popups, and Toasts with their events handler.
09	Program to demonstrate Touch Mode, Menus with their events handler.
10	Program to demonstrate notification with their action.
11	Develop a native calculator application.
12	Implement an application that writes data to the SD card.
13	Write a mobile application that creates alarm clock.
14	Implement an application that implements Multi-threading
15	Write a program to study and use of SQLite database.
16	Study of publishing app to the Android Market.

1. Creating simple project and study of android project structure and installing apk on mobile device/tablet Creating simple project and Configuring mobile device/tablet in Android Studio with developer option and running app directly on mobile device/tablet.

2. Write a program to use of different layouts.

3. Write a program to study Intents for switching between activities.

4. Write a program to use of Intents for SMS and Telephony.

5. Write a program to study and demonstrate Broadcast Receiver.

6. Program to demonstrate Buttons, Text Fields, Checkboxes, Radio Buttons, and Toggle Buttons with their events handler.

7. Creating simple project and study of android project structure and installing apk on mobile device/tablet

8. Creating simple project and Configuring mobile device/tablet in Android Studio with developer option and running app directly on mobile device/tablet.

9. Write a program to use of different layouts.

10. Write a program to study Intents for switching between activities.

11. Write a program to use of Intents for SMS and Telephony.

12. Write a program to study and demonstrate Broadcast Receiver.

13. Program to demonstrate Buttons, Text Fields, Checkboxes, Radio Buttons, and Toggle Buttons with their events handler.

14. Write a program to use of different layouts.
15. Write a program to study Intents for switching between activities.
16. Write a program to study and demonstrate Broadcast Receiver.

DR J.J.MAGDUM COLLEGE OF ENGINEERING, JAYSINGPUR.

Dept of Computer Science & Engg.

Year: 2025-2026

Class: TY CSE   SEM- II

Subject: Database Engineering

Name of Faculty: Prof. A.V.Gundavade

Laboratory Name: Database Lab.

Lecture	Practical	Tutorial		Total Hrs/Wk
04	02	---		6
Theory + Online	Term work	OE	POE	Total Marks
100	25	---	50	175

Experiment List

Sr.no	Experiment Name	Performing /Non Performing
1	Draw an E-R Diagram of any organization	Non-Performing
2	Reduce above mentioned E-R Diagram into tables	Performing
3	Write a program of Database connectivity with any object oriented language.	Performing
4	Use DDL Queries to create, alter (add, modify, rename, drop) & drop Tables	Performing
5	Use DML Queries to insert, delete, update & display records of the tables.	Performing
6	Create table with integrity constraints like primary key, check, not null and unique	Performing
7	Create table with referential integrity constraints with foreign key, on delete cascade and on delete set null.	Performing
8	Display the results of set operations like union, intersections & set difference.	Performing
9	Display the results of Join Operations like cross join, self join, inner join, natural join, left outer join, right outer join and full outer join.	Performing
10	Display the records using Aggregate functions like min, max, avg, sum & count. Also use group by, having clauses	Performing
11	Create & Update views for any created table.	Performing
12	Study of NoSql.	Non-Performing

Subject: Computer Network-II   Class: SY CSE SEM-II 25-26

List of Experiments

1. Client program using UDP to connect to well known services (echo, time of the day service etc.)
2. Implementing concurrent TCP multi service client/server.
3. Implementing Iterative UDP client/server.
4. Study of following DNS Tools with all its options like nslookup, dig, host,whois.
5. Implement trivial file transfer protocol (TFTP).
6. Configuration of basic services for FTP, HTTP, Telnet etc. on LinuxPlatform
7. Write program to send a mail using SMTP commands and receive a mail using POP3commands.
8. Capturing & Analyzing operation of various application layer protocols using network protocolanalyzer. (Wireshark andtcpdump)
9. Study of various streaming multimedia protocols in Internet (Using various audio/video streaming services on theInternet)

Subject : C#

Experiment List

Expt. No.	Name of Experiment	Nature of Experiment
1	Introduction to .Net Architecture	Non- Performing
2	Develop DLL file and use it in application program	Performing
3	OOPS concepts in C#- - 1. Class, Implementation Inheritance, 2. Extension methods (Use any application). 3. Interface Inheritance	Performing
4	Implementation of Multidimensional & Jagged array	Performing
5	Implementation of properties in any application	Performing
6	Implementation of Operator overloading (Any application	Performing
7	String manipulation using String & String builder	Performing
8	Develop program to use Regex. Matches method and Regu Expression pattern matching.	Performing
9	Design a Windows Form based application for differe controls with validations.	Performing

| 10	Develop a Win1dows Form application that performs SELECT, INSERT, UPDAE & DELETE queries and also displays the List of Books available in a Library System by fetching the details from a database. The C# application must also contain the filter capability.	Performing
11	Implement console-based networking application to obt information of network & detect changes in network.	Performing
12	Design a Windows form application to download file process it using stream.	Performing
13	Simple ASP.NET web application deployment in IIS server	Performing
14	Design simple login and registration page using client-side validation controls in ASP.NET	Performing

FACULTY   LIST

DEPARTMENT FACULTY LIST

Academic Year- 2025-2026

Sr. No.	Faculty Name
01	Dr. A. M. Chougule
02	Prof. A. V. Gundawade
03	Prof. R. D. Mane
04	Prof. P. S. Ambupe
05	Prof. S. A. Narade
06	Prof. S. S. Chougule
07	Prof. A. H. Pudale
08	Prof. S. R. Mali
09	Prof. A. S. Patil
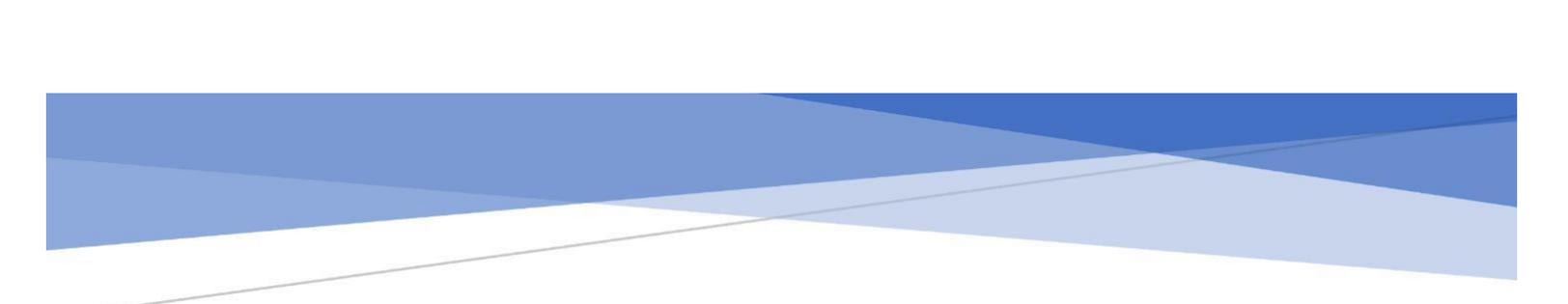
STAFF LIST

DEPARTMENTSTAFFLIST

AcademicYear-2025-2026 SEM-II

Sr.No.	Faculty Name
01	Mr. S. M. Swami (Tech.Assistant)
02	Mr. A. G. Patil (Tech.Assistant)
03	Mr. D. B. Mane (peon)

ACTIVITY   RECORD

Week No.	Month	Week Days							Events
		Mon	Tue	Wed	Thu	Fri	Sat	Sun	
1	January 2026	5	6	7	8	9	10	11	➢ 05 – Commencement of Academic Sem-II ➢ 06- 10 – Declaration of Theory and Lab ISE Components, Updating ERP and LMS ➢ 1st week Industrial visit SY & TY
2		12	13	14	15	16	17	18	➢ 17 – Online Parents meet, Project progress presentation-I
3		19	20	21	22	23	24	25	21-23- VAP on Python SY
4		26	27	28	29	30	31		➢ 26–Republic Day ➢ 27- Higher Education- Expert Lecture on Competitive exams (Alumni & higher education) ➢ 31–AMC Meeting ➢ Academic Dean Feedback ➢ 28-30 VAP on AI practices in industry (B.Tech)
Instruction Days: 21									
4	February 2026							1	➢
5		2	3	4	5	6	7	8	➢ 03-04 – Display of Attendance and Counseling of Defaulters for the Month of January, ➢ 06- Expert lecture for Database (TY CSE) ➢ 7- Alumni interaction 1st week- COMPESA Even
6		9	10	11	12	13	14	15	➢ 15 – Maha shivratri, 16-Principal Feedback
7		16	17	18	19	20	21	22	➢ 19 – Ch. Shivaji Maharaj Jayanti, -Cultural ➢ 20-21-Annual Social Function
8		23	24	25	26	27	28		➢ ➢24-25 – Formative Feedback , ➢27- Project progress presentation-II ➢28 – AMC Meeting
Instruction Days: 22									
8	March 2026							1	
9		2	3	4	5	6	7	8	➢ 02-03 – CIE-I ➢ 04 – Holi (2nd Day), ➢ 05-06 – Display of Attendance and Counseling of Defaulters for the Month of February ➢ 7- Parents meet
10		9	10	11	12	13	14	15	➢ 13-CIE-I Result Declaration ➢ 11-13- VAP on Full stack (TY) ➢ 13- Expert lecture on MAD (B.tech)
11		16	17	18	19	20	21	22	➢ 19-Counsellors session-Final year ➢ 20 – Gudhi Padwa, 21 – Id-Ul-Fitr,
12		23	24	25	26	27	28	29	➢ 27 – Ram Navami, 28 – AMC Meeting
13		30	31						➢ 31 – Mahavir Janmakalyanak
Instruction Days: 21									

									Notes
13	**April 2026**			1	2	3	4	5	➤ 01-02 – Display of Attendance and Counseling of Defaulters for the Month of September, ➤ 03 – Good Friday ➤ 4- Project presentation final
14		6	7	8	9	10	11	12	➤ 10- Expert lecture TOC SY (CSE)
15		13	14	15	16	17	18	19	➤ 18- COMPESA & Campus to Corporate - project competition ➤ 14 – Dr. Babasaheb Ambedkar Jayanti
16		20	21	22	23	24	25	26	➤ 23-24-CIE-II ➤ 24-25 – Summative Feedback
17		27	28	29	30				➤ 30 – PEC Meeting,
Instruction Days: 25									➤
17	**May 2026**				1	2	3		➤ ➤ 1 – Maharashtra Din and Buddha Pournima, ➤ 02-End of Academic Activities, Result declaration of CIE-II ➤ 02-07 – Remedial Classes
18		4	5	6	7	8	9	10	➤ 05 – Submission of ISE Marks, ➤ 06 – Display of Attendance and Defaulters in the Semester, Finalization of List of Detained Students and Submission to the Office of Dean Academics cc to Principal, ➤ 07 – Freezing of Attendance and ISE (Theory and LAB) Marks
19		11	12	13	14	15	16	17	➤ 16-22 – End Semester Examination (Lab POE/ OE)
20		18	19	20	21	22	23	24	
21		25	26	27	28	29	30	31	➤ 26 – Start of End Semester Examination (Theory), 27 – Bakari Id
Instruction Days: 04									➤
22	**June 2026**	1	2	3	4	5	6	7	➤
23		8	9	10	11	12	13	14	➤ 21-World Yoga Day
24		15	16	17	18	19	20	21	➤ 18 – End of End Semester Examination (Theory)
25		22	23	24	25	26	27	28	➤ 26 – Muharram
26		29	30						

Note:	
	A Common Mentoring Activity Slot is to be included during the Last Slot in the Regular Time-Table.
	An In-House Training Slot is to be included in the Regular Time-Table.
	The Probable Date of Result Declaration of End Semester Examination will be 8th July, 2026.
	The probable Date of Reopening/ Commencement of Academic Year 2026-27 Sem – I (Odd Semester) will be 13th July, 2026.
	Mentor Mentee Meeting Monthly Two times

Activities		**Public Holidays**	**Examination**
(yellow)	(purple)	(blue)	(pink)

Total Instruction Days: 90					
Commencement of Academics	End of Academic Activities (Including Remedial Classes)	CIE-I	CIE-II	End Semester Examination (Theory + Lab)	Make-Up Examination
5th January, 2026	7th May, 2026	02-03 March 2026	23-24 April 2026	16th May to 18th June, 2026	In the Month of July, 2026

Academic Co-ordinator **HOD CSE** **DEAN ACADEMICS** **PRINCIPAL**