



ANNAPOORANA ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
Accredited by NAAC with 'A' Grade & NBA (Automobile, Civil, CSE, ECE, EEE & Mechanical)
2(f) & 12(B) Status as per UGC Act 1956

ISO 9001:2015 Certified Institution

NH-47, Sankari Main Road, Periyaseeragapadi, Salem-636308, Tamil Nadu.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

9th Board of Studies Meeting

Venue: Board Room

Date & Time: 03.07.2026 & 10.00a.m





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INDEX

Sl.No	Particulars	Page
1	Circular-BOS	1
2	Attendance-BOS	2
3	Geo-Tagged Photographs	3
4	Minutes of BOS	4
5	Regulation 2026 – Curriculum- UG (Semester I -VIII)	7
6	Regulation 2026 – Curriculum- PG (Semester I-IV)	22
7	Regulation 2026 – PG Semester- I Syllabus	30

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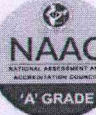
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AEC//CSE/BOS/2026-2027/C09

Date: 01.07.2026

CIRCULAR

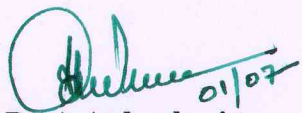
The Eighth Board of Studies meeting of Computer Science and Engineering departments has been scheduled under the chairmanship of Dr. T. Buvaneswari, Head of the Department, Department of Computer Science and Engineering of Annapoorana Engineering College(Autonomous) at Board Room on 03.07.2026 at 10.30am. All the Faculty Members are requested to attend the meeting to discuss the following agenda.

AGENDA

1. Welcome Address by the Chairperson.
2. Confirmation of the minutes of the previous Board of Studies meeting.
3. Presentation of the Action Taken Report (ATR) on the previous BoS recommendations.
4. Discussion and approval of the R-2026 Curriculum and Scheme of Study.
5. Discussion and approval of the course syllabi for the R-2026 Regulations.
6. Discussion on industry requirements, emerging technologies, and value-added courses.
7. Suggestions and recommendations from the BoS members.
8. Any other matter with the permission of the Chair.


Dr.T.Buvaneswari

HoD/CSE


Dr.A.Anbuchejian

Principal

Copy to :

1. Director –Academics
2. Director-Administration
3. All HODs
4. File





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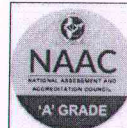
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Minutes of Eighth Board of Studies Meeting on 03.07.2026

Minutes of the meeting of Board of Studies, Computer Science and Engineering, held at 10.00 am on 3rd July 2026(Friday) at Board Room.

Members Present

S.No	Member	Position	Category	Signature
1.	Dr.T.Buveneswari	Professor / HOD	Chairman	
2.	Dr.D.Indumathi	Associate Professor, Department of Computer Science and Engineering PSG College of Technology, Coimbatore.	University Nominee	
3.	Dr.G.Naveen Sundar	Associate Professor, Computer Science and Engineering, Karunya Institute of Technology and Sciences, Coimbatore.	Academic Experts from outside the Parent University	
	Dr.S.Srividhya	Professor & Head, Information Sciences & Engineering BNM Institute of Technology, Bangalore.		
4.	Mr.Raja Chakrapani	Director, Ford Motor Pvt Ltd, Chennai	Industry Representative	
5.	Mr.S.Anandraj	Tech Lead, TCS , Navalur, Chennai	Meritorious Alumnus	
6.	Mr.S.Selvarajan	Professor	Faculty Members	
7.	Dr.O.Saravanan	Professor		
8.	Dr.S.Muniyappan	Associate Professor		
9.	Mr.P.Balamurugan	Assistant Professor		
10.	Mr.S.Rameshkumar	Assistant Professor		
11.	Mrs.G.Suganya	Assistant Professor		
12.	Mrs.R.Saranya	Assistant Professor		
13.	Mrs.R.Sujitha	Assistant Professor		
14.	Mrs.J.Vahithunisha	Assistant Professor		
15.	Mrs.M.Roshini	Assistant Professor		
16.	Mrs.G.Yamuna	Assistant Professor		
17.	Mr.A.Chanthirasekar	Assistant Professor		
18.	Mrs.S.Jayasri	Assistant Professor		





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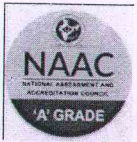
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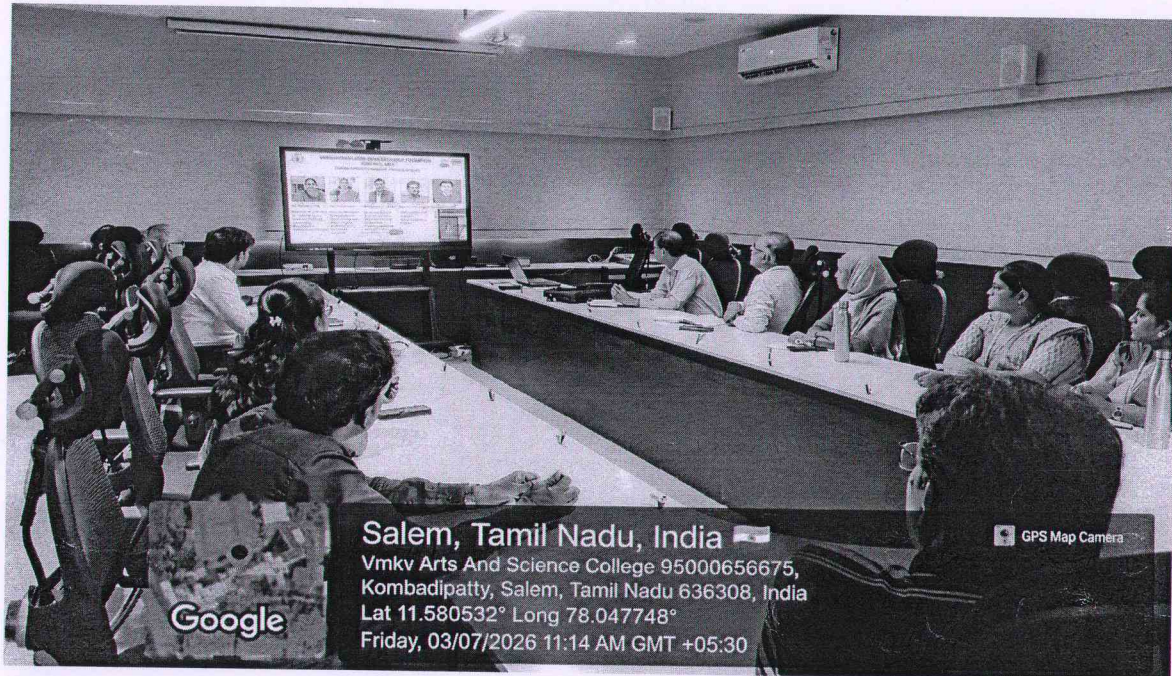
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Venue: Board Room

Date & Time: 03.07.2026 & 10.00 a.m



Salem, Tamil Nadu, India
Vmkv Arts And Science College 95000656675,
Kombadipatty, Salem, Tamil Nadu 636308, India
Lat 11.580532° Long 78.047748°
Friday, 03/07/2026 11:14 AM GMT +05:30

GPS Map Camera



Salem, Tamil Nadu, India
Vmkv Arts And Science College 95000656675,
Kombadipatty, Salem, Tamil Nadu 636308, India
Lat 11.580532° Long 78.047748°
Friday, 03/07/2026 11:14 AM GMT +05:30

GPS Map Camera





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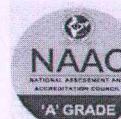
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MINUTES OF BOARD OF STUDIES MEETING

DATE:03-07-2026

The 8th Board of Studies Meeting of the Department of Computer Science and Engineering was held at 10.00 a.m. on 3rd July 2026 (Friday) in the Board Room. The meeting was chaired by Dr. T. Buvaneswari, Professor & Head, Department of Computer Science and Engineering and Chairman of the Board of Studies.

The Chairperson welcomed all the members and briefed them on the history, Vision, Mission, and Quality Policy of Annapoorana Engineering College (Autonomous). The proposed R-2026 Curriculum and Syllabi were presented for discussion and approval. The members actively participated and offered the following recommendations:

- Dr.S.Srividhya, Academic Expert was recommended to review the number of courses offered in Semester IV, as the current course load is comparatively high.
- Mr.Raja Chakraparani, Industry Experts introducing a Cloud Computing Laboratory in Semester V.
- Dr.G.Naveen Sundar, Academic Expert suggested emphasize industry-oriented practical sessions using cloud platforms such as AWS and include project-based learning to enhance students' practical skills.
- Dr.T.Buvaneswari, Prof/HoD recorded that the department has entered into a collaboration with HCL GUVI and L&T EduTech for implementing industry-integrated programs.





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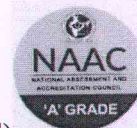
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- Mr.Raja Chakraparani Industry Experts suggested that the Software Project Management (SPM) course in Semester VII should incorporate mini-projects and hands-on activities to strengthen students' practical part of the curriculum.
- Dr.D.Indumathi University Nominee Suggested relevant NPTEL courses be identified and aligned with the syllabus to support self-learning and improve students' domain knowledge.
- Dr.G.Naveen Sundar Academic Experts recommended encouraging students to undertake interdisciplinary and industry-oriented projects with algorithm design and problem-solving approaches.
- Mr.Raja Chakraparani Industry Experts recommended that the Compiler Design course be positioned immediately after the Theory of Computation (TOC) course to maintain continuity in learning.

Master of Engineering (CSE)

- Dr.G.Naveen Sundar Academic Experts recommended strengthening the research orientation of the programme by encouraging high-quality dissertation work and research publications.
- Dr.S.Srividhya Academic Experts suggested introducing advanced elective courses in emerging areas such as Artificial Intelligence, Cyber Security, Data Analytics, Cloud Computing, and Internet of Things to meet current industry demands.





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Meeting concluded with vote of thanks.

Dr.D.Indumathi
Anna University Nominee

Dr.G.Naveen Sundar
Academic Expert

Dr.S.Srividhya
Academic Expert

Mr.Raja Chakrapani
Industry Representative

Mr.S.Anandraj
Meritorious Alumnus

Dr.T.Buvaneswari
Chairman BOS

Dr.A.Anbuchejian
Principal





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B.E COMPUTER SCIENCE AND ENGINEERING

REGULATION-2026

CHOICE BASED CREDIT SYSTEM

CURRICULUM FOR SEMESTER I TO VIII

Applicable to the students admitted from the Academic year 2026-2027 onwards





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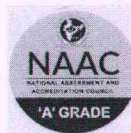
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SEMESTER-I

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26IP001	Induction Programme	-	0	0	0	0	0
2.	26HS101	English Essentials-I	HSMC	2	0	2	4	3
3.	26MA102	Calculus and Functions of Several Variables	BSC	3	0	0	3	3
4.	26PH101	Applied Physics-I	BSC	3	0	0	3	3
5.	26CY101	Applied Chemistry	BSC	3	0	0	3	3
6.	26GE101	Problem Solving and Python Programming	ESC	3	0	2	5	4
7.	26GE103	Essentials of Computing	ESC	3	0	0	3	3
8.	26HS102	Heritage of Tamil	HSMC	1	0	0	1	1
9.	26PC111	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
TOTAL				18	0	8	26	22





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SEMESTER-II

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26HS201	English Essentials-II	HSMC	2	0	2	4	3
2.	26MA202	Differential Equations and Vector Analysis	BSC	3	0	0	3	3
3.	26PH203	Physics for Information Science	BSC	3	0	0	3	3
4.	26CY201	Climate change and sustainability	BSC	2	0	0	2	2
5.	26GE201	C Programming	ESC	3	0	2	5	4
6.	26GE202	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
7.	26GE207	Digital Principles and Computer Organization	ESC	3	0	0	3	3
8.	26HS202	Tamils and Technology	HSMC	1	0	0	1	1
9.	26GE111	Maker Space	ESC	0	0	4	4	2
TOTAL				20	0	8	28	24





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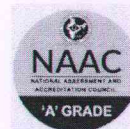
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SEMESTER-III

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26MA301	Discrete Mathematics	BSC	3	0	0	3	3
2.	26CS301	Data Structures using C	PCC	3	0	2	5	4
3.	26CS302	Java Programming	PCC	3	0	2	5	4
4.	26CS303	Operating Systems	PCC	3	0	0	3	3
5.	26CS304	Object Oriented Software Engineering	PCC	3	0	0	3	3
6.		Mandatory Course	MC	2	0	0	2	2
7.		Skill Development Course-I	SDC	0	0	4	4	2
8.	26CS311	Operating Systems Laboratory	PCC	0	0	4	4	2
TOTAL				17	0	12	29	23





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SEMESTER-IV

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26MA401	Probability and Statistics	BSC	3	0	0	3	3
2.	26CS401	Database Management Systems	PCC	3	0	2	5	4
3.	26CS402	Theory of Computation	PCC	3	0	0	3	3
4.	26CS403	Computer Networks	PCC	3	0	0	3	3
5.		Foundations of Artificial Intelligence	ETC	3	0	0	3	3
6.		Skill Development Course - II	SDC	0	0	4	4	2
7.	26CS411	Computer Networks Laboratory	PCC	0	0	4	4	2
8.		Fundamentals of Algorithm Design and Analysis	ESC	3	0	0	3	3
TOTAL				18	0	10	28	23





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SEMESTER-V

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26CS501	Artificial Intelligence and Machine Learning	PCC	3	0	2	5	4
2.	26CS502	Full Stack Development	PCC	3	0	2	5	4
3.	26CS503	Cryptography and Cyber Security	PCC	3	0	0	3	3
4.	26CS504	Compiler Design	PCC	3	0	0	3	3
5.		Professional Elective - I	PEC	3	0	0	3	3
6.		Mandatory Course	MC	3	0	0	3	3
7.		Open Elective - I	OEC	3	0	0	3	3
8.	26CS511	Compiler Design Laboratory	PCC	0	0	4	4	2
TOTAL				21	0	8	29	25





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SEMESTER-VI

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26CS601	Deep Learning	PCC	3	0	2	5	4
2.	26CS602	Mobile App Development	PCC	3	0	0	3	3
3.		Professional Elective - II	PEC	3	0	0	3	3
4.		Professional Elective - III	PEC	3	0	0	3	3
5.		Open Elective - II	OEC	3	0	0	3	3
6.	26CS611	Mobile App Development Laboratory	PCC	0	0	4	4	2
7.		Mandatory Course	MC	3	0	0	3	3
8.		Skill Development Course - III	SDC	0	0	4	4	2
TOTAL				18	0	10	28	23





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SEMESTER-VII

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
THEORY								
1.	26CS701	Cloud Computing	PCC	3	0	2	5	4
2.		Professional Elective - IV	PEC	3	0	0	3	3
3.		Professional Elective - V	PEC	3	0	0	3	3
4.		Professional Elective - VI	PEC	3	0	0	3	3
5.		Open Elective- III	OEC	3	0	0	3	3
6.		Generative AI and Large Language Models	ETC	3	0	0	3	3
7.	26CS711	Prompt Engineering and API Integration Laboratory	PCC	0	0	4	4	2
8.	26IO712	Industry Oriented Course - I	IOC	1	0	0	1	1
TOTAL				19	0	6	25	22





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SEMESTER-VIII

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26CS811	Project Work	SDC	0	0	16	16	8
TOTAL				0	0	16	16	8





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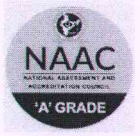
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HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT (HSMC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26HS101	English Essentials-I	HSMC	2	0	2	4	3
2.	26HS102	Heritage of Tamil	HSMC	1	0	0	1	1
3.	26HS201	English Essentials-II	HSMC	2	0	2	4	3
4.	26HS202	Tamils and Technology	HSMC	1	0	0	1	1

ENGINEERING SCIENCE COURSES (ESC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26GE101	Problem Solving and Python Programming	ESC	3	0	2	5	4
2.	26GE103	Essentials of Computing	ESC	3	0	0	3	3
3.	26GE201	C Programming	ESC	3	0	2	5	4
4.	26GE202	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
5.	26GE207	Digital Principles and Computer Organization	ESC	3	0	0	3	3
6.	26GE111	Maker Space	ESC	0	0	4	4	2
7.		Fundamentals of Algorithm Design and Analysis	ESC	3	0	0	3	3

EMERGING TECHNOLOGY COURSE (ETC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.		Foundations of Artificial Intelligence	ETC	3	0	0	3	3
2.		Generative AI and Large Language Models	ETC	3	0	0	3	3





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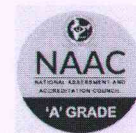
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BASIC SCIENCES COURSE (BSC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26MA102	Calculus and Functions of several variables	BSC	3	0	0	3	3
2.	26PH101	Applied Physics-I	BSC	3	0	0	3	3
3.	26CY101	Applied Chemistry	BSC	3	0	0	3	3
4.	26PC111	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
5.	26MA202	Differential Equations and Vector Analysis	BSC	3	0	0	3	3
6.	26PH203	Physics For Information Science	BSC	3	0	0	3	3
7.	26CY201	Climate change and sustainability	BSC	2	0	0	2	2
8.	26MA301	Discrete Mathematics	BSC	3	0	0	3	3
9.	26MA401	Probability and Statistics	BSC	3	0	0	3	3

SKILL DEVELOPMENT COURSE (SDC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.		Skill Development Course – I	SDC	0	0	4	4	2
2.		Skill Development Course – II	SDC	0	0	4	4	2
3.		Skill Development Course – III	SDC	0	0	4	4	2
4.	26CS811	Project Work	SDC	0	0	16	16	8

SKILL DEVELOPMENT COURSE (SDC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.		Mandatory Course– I	SDC	2	0	0	4	2
2.		Mandatory Course – II	SDC	3	0	0	4	3
3.		Mandatory Course– III	SDC	3	0	0	4	3





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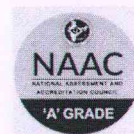
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INDUSTRY ORIENTED COURSE (IOC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26I0712	Industry Oriented Course – I	IOC	1	0	0	1	1





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PROFESSIONAL CORE COURSE (PCC)

S.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	26CS301	Data Structures using C	PCC	3	0	2	5	4
2.	26CS302	Java Programming	PCC	3	0	2	5	4
3.	26CS303	Operating Systems	PCC	3	0	0	3	3
4.	26CS304	Object Oriented Software Engineering	PCC	3	0	0	3	3
5.	26CS311	Operating Systems Laboratory	PCC	0	0	4	4	2
6.	26CS401	Database Management Systems	PCC	3	0	2	5	4
7.	26CS402	Theory of Computation	PCC	3	0	0	3	3
8.	26CS403	Computer Networks	PCC	3	0	0	3	3
9.	26CS411	Computer Networks Laboratory	PCC	0	0	4	4	2
10.	26CS501	Artificial Intelligence and Machine Learning	PCC	3	0	2	5	4
11.	26CS502	Full Stack Development	PCC	3	0	2	5	4
12.	26CS503	Cryptography and Cyber Security	PCC	3	0	0	3	3
13.	26CS504	Compiler Design	PCC	3	0	0	3	3
14.	26CS511	Compiler Design Laboratory	PCC	0	0	4	4	2
15.	26CS601	Deep Learning	PCC	3	0	2	5	4
16.	26CS602	Mobile App Development	PCC	3	0	0	3	3
17.	26CS611	Mobile App Development Laboratory	PCC	0	0	4	4	2
18.	26CS701	Cloud Computing	PCC	3	0	2	5	4
19.	26CS711	Prompt Engineering and API Integration Laboratory	PCC	0	0	4	4	2





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CHOICE BASED CREDIT SYSTEM (CBCS) I TO VIII SEMESTER CURRICULUM SUMMARY

CATEGORY	CREDITS	CREDIT %
HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT	8	04.71
BASIC SCIENCES COURSE	25	14.71
ENGINEERING SCIENCES COURSE	22	12.94
PROFESSIONAL CORE COURSE	59	34.71
MANDATORY COURSE	8	04.71
SKILL DEVELOPMENT COURSE	14	08.23
EMERGING TECHNOLOGY COURSE	6	03.53
INDUSTRY ORIENTED COURSE	1	00.59
PROFESSIONAL ELECTIVE COURSE	18	10.59
OPEN ELECTIVE COURSE	9	05.29
TOTAL	170	100.00





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S. No.	SUBJECT AREA	CREDITS AS PER SEMESTER								TOTAL CREDITS	PERCENTAGE
		I	II	III	IV	V	VI	VII	VIII		
1.	HSMC	4	4							8	04.71
2.	BSC	11	8	3	3					25	14.71
3.	ESC	7	12		3					22	12.94
4.	PCC			16	12	16	9	6		59	34.71
5.	MC			2		3	3			8	04.71
6.	SDC			2	2		2		8	14	08.23
7.	ETC				3			3		6	03.53
8.	IOC							1		1	00.59
9.	PEC					3	6	9		18	10.59
10.	OEC					3	3	3		9	05.29
	Total	22	24	23	23	25	23	22	8	170	100.00
	Non Credit Mandatory	-	-	-	-	-	-	-	-	-	-





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M.E COMPUTER SCIENCE AND ENGINEERING

REGULATION-2026

CHOICE BASED CREDIT SYSTEM

CURRICULUM FOR SEMESTER I TO IV

Applicable to the students admitted from the Academic year 2026-2027 onwards





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SEMESTER-I

S.No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.		Applied Probability and Statistics for Computer Science Engineers	BSC	3	1	0	4	4
2.		Research Methodology and IPR	MC	3	0	0	3	3
3.		Network Technologies	PCC	3	0	0	3	3
4.		Database Practices	PCC	3	0	2	5	4
5.		Advanced Data Structures and Algorithms	PCC	3	1	0	4	4
6.		Principles of Programming Languages	PCC	3	0	0	3	3
7.		Advanced Data Structures and Algorithms Laboratory	PCC	0	0	4	4	2
8.		Technical Seminar	SDC	0	0	2	2	1
TOTAL				18	2	8	28	24





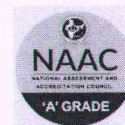
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SEMESTER-II

S.No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.		Internet of Things	PCC	3	0	2	5	4
2.		Machine Learning	PCC	3	0	2	5	4
3.		Advanced Software Engineering	PCC	3	0	0	3	3
4.		Security Practices	PCC	3	0	0	3	3
5.		Programme Elective - I	PEC	3	0	0	3	3
6.		Programme Elective - II	PEC	3	0	0	3	3
7.		Advanced Software Engineering Laboratory	PCC	0	0	4	4	2
8.		Security Practices Laboratory	PCC	0	0	4	4	2
TOTAL				18	0	12	30	24





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SEMESTER-III

S.No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
		Programme Elective - III	PEC	3	0	0	3	3
		Programme Elective - IV	PEC	3	0	0	3	3
		Programme Elective - V	PEC	3	0	0	3	3
		Project Work Phase - I	SDC	0	0	12	12	6
TOTAL				9	0	12	21	15

SEMESTER-IV

S.No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
		Project Work Phase - II	SDC	0	0	24	24	12
TOTAL				0	0	24	24	12





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PROGRAMME ELECTIVE COURSE

S.No	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			CONTACT PERIODS	CREDITS
				L	T	P		
1.		HumanComputerInteraction	PEC	3	0	0	3	3
2.		CloudComputingTechnologies	PEC	3	0	0	3	3
3.		FoundationsofDataScience	PEC	3	0	0	3	3
4.		WirelessCommunications	PEC	3	0	0	3	3
5.		AgileMethodologies	PEC	3	0	0	3	3
6.		PerformanceAnalysisof ComputerSystems	PEC	3	0	0	3	3
7.		R Programming	PEC	3	0	0	3	3
8.		HighPerformanceComputing ForBig Data	PEC	3	0	0	3	3
9.		InformationRetrieval Techniques	PEC	3	0	0	3	3
10.		SoftwareQualityAssurance	PEC	3	0	0	3	3
11.		Autonomous Systems	PEC	3	0	0	3	3
12.		WebAnalytics	PEC	3	0	0	3	3
13.		CognitiveComputing	PEC	3	0	0	3	3
14.		CyberPhysicalSystems	PEC	3	0	0	3	3
15.		MobileandPervasive Computing	PEC	3	0	0	3	3
16.		WebServices andAPIDesign	PEC	3	0	0	3	3
17.		DataVisualizationTechniques	PEC	3	0	0	3	3
18.		CompilerOptimization Techniques	PEC	3	0	0	3	3
19.		FormalModelsof Software Systems	PEC	3	0	0	3	3
20.		Robotics	PEC	3	0	0	3	3
21.		MixedReality	PEC	3	0	0	3	3
22.		DevopsandMicroservices	PEC	3	0	0	3	3
23.		MobileApplicationDevelopment	PEC	3	0	0	3	3
24.		Deep Learning	PEC	3	0	0	3	3
25.		BlockchainTechnologies	PEC	3	0	0	3	3





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26.		EmbeddedSoftware Development	PEC	3	0	0	3	3
27.		FullStackWeb Application Development	PEC	3	0	0	3	3
28.		Bioinformatics	PEC	3	0	0	3	3
29.		AdvancedOperatingSystem	PEC	3	0	0	3	3
30.		DigitalImageProcessing	PEC	3	0	0	3	3
31.		QuantumComputing	PEC	3	0	0	3	3
32.		BigDataMiningandAnalytics	PEC	3	0	0	3	3
33.		NaturalLanguageProcessing	PEC	3	0	0	3	3
34.		GPUComputing	PEC	3	0	0	3	3
35.		Multicore Architecture and Programming	PEC	3	0	0	3	3





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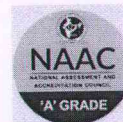
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BASIC SCIENCE COURSE (BSC)

S.No	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS
			L	T	P	
1.		Applied Probability and Statistics for Computer Science Engineers	3	1	0	4

PROFESSIONAL CORE COURSE (PCC)

S.No	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS
			L	T	P	
1.		Network Technologies	3	0	0	3
2.		Database Practices	3	0	2	4
3.		Advanced Data Structures and Algorithms	3	0	0	3
4.		Principles of Programming Languages	3	0	0	3
5.		Advanced Data Structures and Algorithms Laboratory	0	0	4	2
6.		Internet of Things	3	0	2	4
7.		Machine Learning	3	0	2	4
8.		Advanced Software Engineering	3	0	0	3
9.		Security Practices	3	0	0	3
10.		Advanced Software Engineering Laboratory	0	0	4	2

MANDATORY COURSE (MC)

S.No	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS
			L	T	P	
1.		Research Methodology and IPR	3	0	0	3

SKILL DEVELOPMENT COURSE (SDC)

S. No	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS
			L	T	P	
1.		Technical Seminar	0	0	2	1
2.		Project Work - I	0	0	12	6
3.		Project Work - II	0	0	24	12





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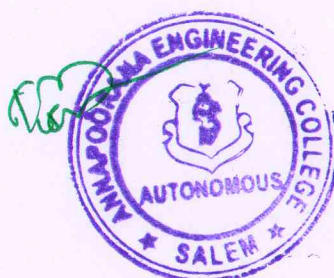
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CHOICE BASED CREDIT SYSTEM (CBCS) I TO IV SEMESTER CURRICULUM SUMMARY

CATEGORY	CREDITS	CREDIT %
BASIC SCIENCES COURSE	4	05.33
PROFESSIONAL CORE COURSE	34	45.33
MANDATORY COURSE	3	04.00
SKILL DEVELOPMENT COURSES	19	25.33
PROGRAMME ELECTIVE COURSE	15	20.00
TOTAL	75	100

S. No.	SUBJECT AREA	CREDITS AS PER SEMESTER				TOTAL CREDITS	PERCENTAGE
		I	II	III	IV		
1.	BSC	4	-	-	-	4	05.33
2.	PCC	16	18	-	-	34	45.33
3.	MC	3	-	-	-	3	04.00
4.	SDC	-	1	6	12	19	25.33
5.	PEC	-	6	9	-	15	20.00
Total		23	25	15	12	75	100
	Mandatory Courses	-	-	-	-	-	-





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M.E. COMPUTER SCIENCE AND ENGINEERING

SYLLABUS-2026

SEMESTER -1

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	APPLIED PROBABILITY AND STATISTICS FOR COMPUTER SCIENCE ENGINEERS	L	T	P	C
		3	1	0	4
Course Objectives:	- To encourage students to develop a working knowledge of the central ideas of Linear Algebra. - To enable students to understand the concepts of Probability and Random Variables. - To understand the basic probability concepts with respect to two dimensional random variables along with the relationship between the random variables and the significance of the central limit theorem. - To apply the small/large sample tests through Tests of hypothesis. - To enable the students to use the concepts of multivariate normal distribution and principal components analysis.				
UNIT - I	LINEAR ALGEBRA	12			
Vector spaces – norms – Inner Products – Eigenvalues using QR transformations – QR factorization – generalized eigenvectors – Canonical forms – singular value decomposition and applications – pseudo inverse – least square approximations.					
UNIT - II	PROBABILITY AND RANDOM VARIABLES	12			
Probability–Axioms of probability–Conditional probability–Baye’s theorem–Random variables – Probability function – Moments – Moment generating functions and their properties – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions–Function of a random variable.					
UNIT - III	TWO DIMENSIONAL RANDOM VARIABLES	12			
Joint distributions – Marginal and conditional distributions – Functions of two-dimensional random variables–Regression curve–Correlation					
UNIT - IV	TESTING OF HYPOTHESIS	12			
Sampling distributions – Type I and Type II errors – Small and Large samples – Tests based on Normal T Chisquare and F distributions for testing of mean, variance and proportions–Tests for independence of attributes and goodness of fit.					
UNIT - V	MULTI VARIATE ANALYSIS	12			
Random vectors and matrices–Mean vectors and covariance matrices–Multivariate normal density and its properties – Principal components – Population principal components – Principal components from standardized variables.					
TOTAL: 60 PERIODS					





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TEXT BOOKS:

1	Dallas E Johnson, "Applied multivariate methods for data Analysis", Thomson and Duxbury press, Singapore, 1998.
2	Richard A. Johnson and Dean W. Wichern, "Applied multivariate statistical Analysis", Pearson Education, Fifth Edition, 6 th Edition, New Delhi, 2013.

REFERENCES:

1	Bronson, R., "Matrix Operation" Schaum's outline series, Tata McGraw Hill, New York, 2011.
2	Oliver C. Ibe, "Fundamentals of Applied probability and Random Processes", Academic Press, Boston, 2014.
3	Johnson R. A. and Gupta C. B., "Miller and Freund's Probability and Statistics for Engineers", Pearson India Education, Asia, 9 th Edition, New Delhi, 2017.

COURSE NAME : APPLIED PROBABILITY AND STATISTICS FOR COMPUTER SCIENCE ENGINEERS						COURSE CODE:			
CO	Course Outcomes	Unit	K-CO	POs	PSOs				
CO1	Apply the concepts of Linear Algebra to solve practical engineering problems.	I	K3	1,2	1,2				
CO2	Use the ideas of probability and random variables in solving engineering problems.	II	K2	1,2,5	1				
CO3	Analyse two-dimensional random variables, regression and correlation, and extend them to multivariate analysis.	III	K3	1,2,4,5,9,10,11	1				
CO4	Apply statistical hypothesis testing using appropriate sampling distributions and inferential techniques.	IV	K5	1,2,3,4,9,10,11	1				
CO5	Apply multivariate statistical methods such as multivariate normal distribution and principal component analysis to analyse data.	V	K4	1,2	1				

CO-PO-PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	3	2	-	-	-	-	-	-	-	3	2
CO2	3	3	-	2	2	-	-	-	-	-	-	-	3	2
CO3	3	3	-	3	2	-	-	-	2	3	2	-	3	2
CO4	3	3	3	3	-	-	-	-	2	3	2	-	3	2
CO5	3	3	2	3	2	-	-	-	2	3	2	2	3	2
CO	3	3	2	2.8	2	-	-	-	2	3	2	2	3	2





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		NETWORK TECHNOLOGIES			
		L	T	P	C
		3	0	0	3
Course Objectives:	- To understand the basic concepts of networks - To explorevarious technologies in the wireless domain - To study about 4G and 5G cellular networks - To learn about Network FunctionVirtualization - To understand the paradigm of Software defined networks				
UNIT - I	NETWORKING CONCEPTS				9
Peer To Peer Vs Client-Server Networks-Network Devices-NetworkTerminology-Network Speeds-Network throughput-delay-OSI Model-Packets,Frames,And Headers-Collision and Broadcast Domains-LAN Vs WAN-Network Adapter- Hub-Switch-Router-Firewall-IP addressing.					
UNIT - II	WIRELESS NETWORKS				9
Wireless access techniques- IEEE 802.11a, 802.11g, 802.11e, 802.11n/ac/ax/ay/ba/be, QoS – Bluetooth–ProtocolStack–Security–Profiles–zigbee					
UNIT - III	MOBILE DATA NETWORKS				9
4GNetworksandCompositeRadioEnvironment–ProtocolBoosters–Hybrid4GWireless Networks Protocols –Green Wireless Networks –Physical Layer and Multiple Access – Channel Modelling for 4G – Concepts of 5G – channel access –air interface -Cognitive Radio-spectrum management – C-RAN architecture - Vehicular communications-protocol – Network slicing – MIMO, mmWave, Introduction to 6G.					
UNIT - IV	SOFTWARE DEFINED NETWORKS				9
SDN Architecture. Characteristics of Software-Defined Networking. SDN- and NFV-Related Standards. SDN Data Plane. Data Plane Functions. Data Plane Protocols. OpenFlow Logical Network Device. Flow Table Structure. Flow Table Pipeline. The Use of Multiple Tables. Group Table. OpenFlow Protocol. SDN Control Plane Architecture. Control Plane Functions. Southbound Interface. Northbound Interface. Routing. ITU-T Model. OpenDaylight.OpenDaylight Architecture. OpenDaylight Helium. SDN Application Plane Architecture. Northbound Interface. Network Services Abstraction Layer. Network Applications. UserInterface.					
UNIT - V	NETWORK FUNCTIONS VIRTUALIZATION				9
Motivation-Virtual Machines –NFV benefits-requirements – architecture- NFV Infrastructure - Virtualized Network Functions - NFV Management and Orchestration- NFV Use Cases- NFVand SDN –Network virtualization – VLAN and VPN					
TOTAL: 45 PERIODS					





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TEXT BOOKS:

- 1 JamesBernstein,“NetworkingmadeEasy”,2018.(UNITI)
- 2 HoudaLabiod, Costantino de Santis, HossamAfifi “Wi-Fi, Bluetooth, Zigbee and WiMax”, Springer 2007 (UNIT 2)

REFERENCES:

- 1 ThomasD.NadeauandKenGray,SDN–SoftwareDefinedNetworks,O’Reilly Publishers, 2013.
- 2 GuyPujolle,“SoftwareNetworks”,SecondEdition,Wiley-ISTE,2020

COURSE NAME: NETWORK TECHNOLOGIES										COURSE CODE:				
CO	Course Outcomes									Unit	K-CO	POs	PSOs	
CO1	Explain basic networking concepts.									I	K2	1,2,4,5,12	1	
CO2	Compare different wireless networking protocols.									II	K3	1,2,4,5,12	1,2	
CO3	Describe the developments in 4G, 5G and emerging mobile data networks.									III	K2	1,2,3,4,5,10,12	1,2	
CO4	Explain and develop Software Defined Networking (SDN) based applications.									IV	K3	1,2,3,4,5,9,10,11,12	1	
CO5	Explain the concepts of Network Function Virtualization (NFV) and network virtualization.									V	K2	1,2,3,4,5,9,10,11,12	1,2	
CO-PO-PSO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	–	2	2	–	–	–	–	–	–	1	3	2
CO2	3	3	–	2	3	–	–	–	–	–	–	1	3	2
CO3	3	3	3	3	3	–	–	–	–	2	–	1	3	3
CO4	3	3	3	3	3	–	–	–	2	3	2	1	3	3
CO5	3	3	3	2	3	–	–	–	2	2	2	3	3	3
CO	3	3	3	2.4	2.8				2	2.33 3333	2	1.4	3	2.6





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	DATABASE PRACTICES	L	T	P	C
		3	0	2	4
Course Objectives:	- Describe thefundamentalelementsofrelationaldatabasemanagementsystems - Explain the basicconceptsofrelationaldatamodel,entity-Relationship model,relational database design, relational algebra and SQL. - Understandqueryprocessinginadistributeddatabasesystem - Understandthebasics ofXML andcreatewell-formed andvalidXML documents.				
UNIT - I	RELATIONAL DATA MODEL	15			
Entity Relationship Model–Relational Data Model–Mapping Entity Relationship-Modelto Relational Model – Relational Algebra – Structured Query Language – Database Normalization.					
SuggestedActivities:					
DataDefinitionLanguage					
- Create,Alterand Drop - Enforce PrimaryKey, ForeignKey, Check,Unique and Not NullConstraints - Creating Views					
DataManipulationLanguage					
- Insert,Delete,Update - CartesianProduct,EquiJoin,LeftOuterJoin,RightOuterJoin and Full OuterJoin - Aggregate Functions - Set Operations - Nested Queries					
Transaction ControlLanguage					
Commit,Rollback and SavePoints					
UNIT - II	DISTRIBUTED DATABASES, ACTIVE DATA BASES AND OPEN DATABASE CONNECTIVITY	15			
Distributed Database Architecture —Distributed Data Storage —Distributed Transactions — Distributed Query Processing – Distributed Transaction Management – Event Condition Action Model – Design and Implementation Issues for Active Databases – Open Database Connectivity.					
Suggested Activities:					
- DistributedDatabaseDesignandImplementation - RowLevelandStatementLevelTriggers - AccessingaRelationalDatabaseusingPHP,PythonandR					





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UNIT - III	XML DATABASES	15
Structured, Semi structured, and Unstructured Data —XML Hierarchical Data Model —XML Documents—Document Type Definition— XML Schema—XML Documents and Databases—XML Querying—XPath—XQuery Suggested Activities: • Creating XML Documents, Document Type Definition and XML Schema • Using a Relational Database to store the XML documents as text • Using a Relational Database to store the XML documents as data elements • Creating or publishing customized XML documents from pre-existing relational databases • Extracting XML Documents from Relational Databases • XML Querying		
UNIT - IV	NOSQL DATA BASES AND BIG DATA STORAGE SYSTEMS	15
NoSQL—Categories of NoSQL Systems—CAP Theorem—Document-Based NoSQL Systems and MongoDB – MongoDB Data Model – MongoDB Distributed Systems Characteristics – NoSQL Key-Value Stores – DynamoDB Overview – Voldemort Key-Value Distributed Data Store – Wide Column NoSQL Systems—Hbase Data Model—Hbase Crud Operations—Hbase Storage and Distributed System Concepts –NoSQL Graph Databases and Neo4j – Cypher Query Language of Neo4j—Big Data—MapReduce—Hadoop—YARN. Suggested Activities: • Creating Databases using MongoDB, DynamoDB, Voldemort Key-Value Distributed Data Store Hbase and Neo4j • Writing simple queries to access databases created using MongoDB, DynamoDB, Voldemort Key-Value Distributed Data Store Hbase and Neo4j.		
UNIT - V	DATABASE SECURITY	15
Database Security Issues—Discretionary Access Control Based on Granting and Revoking Privileges –Mandatory Access Control and Role-Based Access Control for Multilevel Security – SQL Injection –Statistical Database Security –Flow Control – Encryption and Public Key Infrastructures—Preserving Data Privacy —Challenges to Maintaining Database Security – Database Survivability – Oracle Label-Based Security. Suggested Activities: Implementing Access Control in Relational Databases		
		TOTAL:75 PERIODS





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TEXT BOOKS:

1	R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Seventh Edition, Pearson Education 2016.
2	Henry F. Korth, Abraham Silberschatz, S. Sudharshan, "Database System Concepts", Seventh Edition, McGraw Hill, 2019.

REFERENCES:

1	Harrison, Guy, "Next Generation Databases, NoSQL and Big Data", First Edition, Apress Publishers, 2015.
2	Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Sixth Edition, Pearson Education, 2015.

COURSE NAME: DATABASE PRACTICES

COURSE CODE:

CO	Course Outcomes	Unit	K-CO	POs	PSOs
CO1	Convert the ER-model to relational tables, populate relational databases and formulate SQL queries on data.	I	K3	1,2,4,5	1
CO2	Understand and write well-formed XML documents	II	K2	1,2,4,5	1,2
CO3	Be able to apply methods and techniques for distributed query processing.	III	K3	1,2,3,4,5,10	1,2
CO4	Design and implement secure database systems.	IV	K4	1,2,3,4,5,9,10,11	1
CO5	Use the data control, definition, and manipulation languages of the NoSQL databases	V	K3	1,2,3,4,5,9,10,11,12	1,2

CO-PO-PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	0	2	3	0	0	0	0	0	0	1	3	2
CO2	3	3	0	2	3	0	0	0	0	0	0	1	3	2
CO3	3	3	3	3	3	0	0	0	0	2	0	1	3	3
CO4	3	3	3	3	3	0	0	0	2	3	2	1	3	3
CO5	3	3	3	3	3	0	0	0	2	2	2	3	3	3
CO	3	3	1.8	2.6	3	0	0	0	0.8	1.4	0.8	1.4	3	2.6





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	ADVANCED DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	1	0	4
Course Objectives:	• To understand the usage of algorithms in computing • To learn and use hierarchical data structures and its operations • To learn the usage of graphs and its applications • To select and design data structures and algorithms that is appropriate for problems • To study about NPCompleteness of problems				
UNIT - I	ROLE OF ALGORITHMS IN COMPUTING & COMPLEXITY ANALYSIS	12			
Algorithms – Algorithms as a Technology -Time and Space complexity of algorithms- Asymptotic analysis-Average and worst-case analysis-Asymptotic notation-Importance of efficient algorithms-Program performance measurement - Recurrences: The Substitution Method – The Recursion-TreeMethod-Datastructuresandalgorithms..					
UNIT - II	HIERARCHICAL DATA STRUCTURES	12			
Binary SearchTrees:Basics–Queryinga Binary search tree–Insertion and Deletion-Red Black trees: Properties of Red-Black Trees –Rotations –Insertion –Deletion -B-Trees: Definition of B-trees–Basic operations on B-Trees–Deleting a key fromaB-Tree-Heap– Heap Implementation – Disjoint Sets - Fibonacci Heaps: structure – Mergeable-heap operations-Decreasing a key and deleting a node-Bounding the maximum degree.					
UNIT - III	GRAPHS	12			
Elementary Graph Algorithms: Representations of Graphs – Breadth-First Search – Depth-First Search–TopologicalSort –Strongly Connected Components- Minimum Spanning Trees: Growing a Minimum Spanning Tree – Kruskal and Prim- Single-Source Shortest Paths: The Bellman-Ford algorithm – Single-Source Shortest paths in Directed Acyclic Graphs – Dijkstra’sAlgorithm; Dynamic Programming - All-Pairs Shortest Paths: Shortest Paths and Matrix Multiplication – The Floyd-Warshall Algorithm					
UNIT - IV	ALGORITHM DESIGN TECHNIQUES	12			
DynamicProgramming:Matrix-ChainMultiplication–ElementsofDynamicProgramming– Longest Common Subsequence- Greedy Algorithms: – Elements of the Greedy Strategy- An Activity-Selection Problem - Huffman Coding.					
UNIT - V	NP COMPLETE AND NP HARD	12			
NP-Completeness: Polynomial Time – Polynomial-Time Verification – NP- Completeness and Reducibility – NP-Completeness Proofs – NP-Complete Problems.					
					TOTAL: 60 PERIODS





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TEXT BOOKS:

1	E.Horowitz,S.SahniandS.Rajasekaran,“Fundamentals of Computer Algorithms”, University Press, 2nd Edition, 2008
2	AlfredV.Aho,JohnE.Hopcroft,Jeffrey D.Ullman,“Data Structures and Algorithms”, Pearson Education, Reprint 2006.

REFERENCES:

1	S.Sridhar,“Design and Analysis of Algorithms”,Oxford University Press,1st Edition, 2014.
2	AdamDrozdex,“Data Structures and algorithms in C++”,Cengage Learning,4th Edition, 2013.

COURSE NAME: ADVANCED DATA STRUCTURES AND ALGORITHMS											COURSE CODE:			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
CO1	Design data structures and algorithms to solve computing problems.										I	K3	1,2,4,5	1
CO2	Choose and implement efficient data structures and apply them to										II	K3	1,2,3,4,5	1,2
CO3	Design algorithms using graph structure and various string-matching algorithms to solve real-life problems.										III	K4	1,2,3,4,5,10,	1,2
CO4	Design one's own algorithm for an unknown problem.										IV	K4	1,2,3,4,5,9,10,11	1
CO5	Apply suitable design strategy for problem solving.										V	K4	1,2,3,4,5,9,10,11,12	1,2
CO-PO-PSO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	0	2	3	0	0	0	0	0	0	1	3	2
CO2	3	3	0	2	3	0	0	0	0	0	0	1	3	2
CO3	3	3	3	3	3	0	0	0	0	2	0	1	3	3
CO4	3	3	3	3	3	0	0	0	2	3	2	1	3	3
CO5	3	3	3	3	3	0	0	0	2	2	2	3	3	3
CO	3	3	1.8	2.6	3	0	0	0	0.8	1.4	0.8	1.4	3	2.6





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PRINCIPLES OF PROGRAMMING LANGUAGES		L	T	P	C
		3	0	0	3
Course Objectives:	• To understand and describe syntax and semantics of programming languages • To understand data, data types, and basic statements • To understand call-return architecture and ways of implementing them • To understand object-orientation, concurrency, and event handling in programming languages • To develop programs in non-procedural programming paradigms				
UNIT - I	SYNTAX AND SEMANTICS			9	
Evolution of programming languages – describing syntax – context – free grammars –attribute grammars – describing semantics – lexical analysis – parsing – recursive-descent – bottom- up parsing					
UNIT - II	DATA, DATA TYPES, AND BASIC STATEMENTS			9	
Names – variables – binding – type checking – scope – scope rules – lifetime and garbage collection – primitive data types–strings–array types– associative arrays–record types– union types – pointers and references – Arithmetic expressions – overloaded operators – type conversions – relational and boolean expressions – assignment statements – mixed- mode assignments – control structures – selection – iterations – branching – guarded statements					
UNIT - III	SUBPROGRAMS AND IMPLEMENTATIONS			9	
Subprograms – design issues – local referencing – parameter passing – overloaded methods – generic methods – design issues for functions – semantics of call and return – implementing simple subprograms – stack and dynamic local variables – nested subprograms – blocks – dynamic scoping					
UNIT - IV	OBJECT-ORIENTATION,CONCURRENCY,AND EVENT			9	
Object-orientation – design issues for OOP languages – implementation of object-oriented constructs – concurrency – semaphores – monitors – message passing – threads – statement level concurrency – exception handling – event handling					
UNIT - V	FUNCTIONAL AND LOGIC PROGRAMMING LANGUAGES			9	
Introduction to lambda calculus – fundamentals of functional programming languages – Programming with Scheme – Programming with ML – Introduction to logic and logic programming – Programming with Prolog – multi-paradigm languages					
TOTAL: 45 PERIODS					





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TEXT BOOKS:

1	Robert W. Sebesta, "Concepts of Programming Languages", Eleventh Edition, Addison Wesley, 2012
2	W. F. Clocksin and C. S. Mellish, "Programming in Prolog: Using the ISO Standard", Fifth Edition, Springer, 2003

REFERENCES:

1	R.KentDybvig, "The Scheme programming language", Fourth Edition, MIT Press, 2009.
2	W.F.Clocksin and C.S.Mellish, "Programming in Prolog: Using the ISO Standard", Fifth Edition, Springer, 2003.

COURSE NAME: PRINCIPLES OF PROGRAMMING LANGUAGES										COURSE CODE:				
CO	Course Outcomes									Unit	K-CO	POs	PSOs	
CO1	Describe syntax and semantics of programming languages.									I	K2	1, 2	1	
CO2	Explain data, data types, and basic statements of programming languages.									II	K2	1, 2,5	1	
CO3	Design and implement subprogram constructs.									III	K3	1,2,3,5	1,2	
CO4	Apply object-oriented, concurrency, and event handling programming constructs.									IV	K3	1,2,3,5,9, 10	1,2	
CO5	Develop programs in Scheme, ML, and Prolog and adopt new programming languages.									V	K4	1,2,3,5,12	1,2	
CO-PO-PSO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	–	2	2	–	–	–	–	–	–	1	3	2
CO2	3	3	–	2	3	–	–	–	–	–	–	1	3	2
CO3	3	3	3	3	3	–	–	–	–	2	–	1	3	3
CO4	3	3	3	3	3	–	–	–	2	3	2	1	3	3
CO5	3	3	3	2	3	–	–	–	2	2	2	3	3	3
CO	3	3	1.8	2.4	2.8	-	-	-	0.8	1.4	0.8	1.4	3	2.4





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	ADVANCED DATA STRUCTURES AND ALGORITHMS LABORATORY	L	T	P	C
		0	0	4	2
Course Objectives:	• To understand the usage of algorithms in computing • To learn and use hierarchical data structures and its operations • To learn the usage of graphs and its applications • To select and design data structures and algorithms that is appropriate for problems • To study about NPCompleteness of problems				
LIST OF PROGRAMS					
1: Implementation of recursive function for tree traversal and Fibonacci 2: Implementation of iteration function for tree traversal and Fibonacci 3: Implementation of Merge Sort and Quick Sort 4: Implementation of a Binary Search Tree 5: Red-Black Tree Implementation 6: Heap Implementation 7: Fibonacci Heap Implementation 8: Graph Traversals 9: Spanning Tree Implementation 10: Shortest Path Algorithms (Dijkstra's algorithm, Bellman Ford Algorithm) 11: Implementation of Matrix Chain Multiplication 12: Activity Selection and Huffman Coding Implementation					
					TOTAL: 60 PERIODS





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Course Name: ADVANCED DATA STRUCTURES AND ALGORITHMS LABORATORY											Course code:			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
CO1	Design and implement basic and advanced data structures extensively.										I	K1	1,2,3,4,5,11,12	1,2
CO2	Design algorithms using graph structures.										II	K1, K2	1,2,3,4,5,11,12	1
CO3	Design and develop efficient algorithms with minimum complexity using design techniques.										III	K1, K3	1,2,3,4,5,11	1
CO4	Develop programs using various algorithms.										IV	K5	1,2,3,5,11	1
CO5	Choose appropriate data structures and algorithms and use ADTs/libraries to solve specific problems.										V	K4	1,2,5,11	1
CO-PO-PSO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3	0	0	0	0	0	0	1	3	3
CO2	3	3	3	3	3	0	0	0	0	1	0	1	3	3
CO3	3	3	3	3	3	0	0	0	1	2	1	1	3	3
CO4	3	3	3	3	3	0	0	0	2	3	2	1	3	3
CO5	3	3	3	3	3	0	0	0	2	2	2	3	3	3
CO	3	3	3	2.8	3	0	0	0	1	1.8	1	1.4	3	3





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	TECHNICAL SEMINAR	L	T	P	C
		0	0	2	1
COURSE OBJECTIVES:	In this course, students will develop their scientific and technical reading and writing skills that they need to understand and construct research articles. A term paper requires a student to obtain information from a variety of sources (i.e., Journals, dictionaries, reference books) and then place it in logically developed ideas. The work involves the following step				
	1. Selecting a subject, narrowing the subject into a topic. 2. Stating an objective. 3. Collecting the relevant bibliography (at least 15 journal papers) 4. Preparing a working outline. 5. Studying the papers and understanding the authors contributions and critically analysing each Paper. 6. Preparing a working outline. 7. Linking the papers and preparing a draft of the paper. 8. Preparing conclusions based on the reading of all the papers. 9. Writing the Final Paper and giving final Presentation.				
TOTAL:30 PERIODS					

