B.Tech – Information Technology

CURRICULUM & SYLLABI

Regulation 2018

(Applicable to candidates admitted in the academic year 2018-2019 onwards)

K.S.R. College of Engineering

(Autonomous)
K.S.R. Kalvi Nagar, Tiruchengode – 637 215
Namakkal (Dt), Tamilnadu, India
Email : info@ksrce.ac.in   Website : www.ksrce.ac.in

K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE - 637 215

(Autonomous)

DEPARTMENT OF INFORMATION TECHNOLOGY

(REGULATIONS 2018)

Vision of the Institution

IV	We envision to achieve status as an excellent Educational Institution in the global knowledge hub, making self-learners, experts, ethical and responsible engineers, technologists, scientists, managers, administrators and entrepreneurs who will significantly contribute to research and environment friendly sustainable growth of the nation and the world.

Mission of the Institution

IM 1 To inculcate in the students self-learning abilities that enable them to become competitive and considerate engineers, technologists, scientists, managers, administrators and entrepreneurs by diligently imparting the best of education, nurturing environmental and social needs.

IM 2 To foster and maintain mutually beneficial partnership with global industries and Institutions through knowledge sharing, collaborative research and innovation.

Vision of the Department

DV	To create ever green professionals for software industry, academicians for knowledge cultivation and researchers for contemporary society modernization.

Mission of the Department

DM 1 To make the students competitive and efficient in technical field through technological transformations in Information Technology, by providing them advanced curriculum, infrastructure and nurturing human values.

DM 2 To provide an excellent forum for higher studies that leads to careers as Computer and IT professionals in the widely diversified domains of industry, government and academia.

Programme Educational Objectives (PEOs)

The graduates of the programme will be able to

PEO 1 Engineering Acquaintance: Incorporate with necessary background in science and engineering fundamentals to analyze and solve IT problems and prepare them skilled manpower in the field of IT for subsequently generation.

PEO 2 Modern Technical Tools: Enhance in latest programming languages, technologies, software development process and communication technology.

PEO 3 Personality Development: Attain a successful career in industry through effective communication skills, team spirit, learning ethical responsibilities, attitude and adaptation to emerging technologies.

Programme Outcomes (POs)

PO1	**Engineering Graduates will be able to:** **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern Tool Usage:** Create, select, and apply appropriate techniques, resource, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader diverse teams, and in multidisciplinary settings..
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadcast context of technological change.
Program Specific Outcomes (PSOs)	
PSO1	**Technical competency:** Analyze a problem, design algorithm, identify and define the computing requirements appropriate to its solution and implement the same.
PSO2	**Professional awareness:** Contribute core universal values and social good in the community.

K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215	CURRICULUM UG R - 2018

Department	Department of Information Technology
Programme	B.Tech - Information Technology

SEMESTER - I

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18EN151	Technical English - I (Common To All Branches)	HSMC	2	0	1	3	30	70	100
2.	18MA151	Engineering Mathematics - I (Common To All Branches)	BSC	3	1	0	4	30	70	100
3.	18CH051	Engineering Chemistry (Common To All Branches)	BSC	3	0	0	3	30	70	100
4.	18EE041	Basics of Electrical and Electronics Engineering (Common To AU,CE,CS, IT & ME)	ESC	3	0	0	3	30	70	100
5.	18IT111	Programming for Problem Solving using C	ESC	3	0	0	3	30	70	100
PRACTICAL										
6.	18CH028	Chemistry Laboratory (Common To All Branches)	BSC	0	0	3	1	50	50	100
7.	18IT121	Programming for Problem Solving Laboratory	ESC	0	0	3	1	50	50	100
8.	18AU027	Engineering Graphics Laboratory (Common To CE,CS,EC,EE & IT)	ESC	0	0	3	1	50	50	100
Total				15	1	9	19	**800**		

Induction program will be conducted for three weeks as per AICTE guidelines

SEMESTER - II

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18EN251	Technical English-II (Common To All Branches)	HSMC	2	0	1	3	30	70	100
2.	18MA243	Discrete Mathematics (Common To CS & IT)	BSC	3	1	0	4	30	70	100
3.	18PH043	Engineering Physics (Common To CS,EC,EE & IT)	BSC	3	0	0	3	30	70	100
4.	18IT211	Python Programming	PCC	3	0	0	3	30	70	100
5.	18GE028	Manufacturing Practices (Common To CS,EC,EE & IT)	ESC	1	0	4	3	30	70	100
MANDATORY COURSES										
6	18MC052	Environmental Science and Engineering (Common To All Branches)	MC	3	0	0	0	50	50	100
PRACTICAL										
7.	18PH028	Physics Laboratory (Common To All Branches)	BSC	0	0	3	1	50	50	100
8.	18IT221	Python Programming Laboratory	PCC	0	0	3	1	50	50	100
9.	18IT222	IT Essential Laboratory	PCC	0	0	3	1	50	50	100
Total				16	1	13	19	**900**		

	K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215	CURRICULUM UG R - 2018

Department	Department of Information Technology
Programme	B.Tech - Information Technology

SEMESTER - III

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18MA343	Numerical Computational Techniques (Common To CS & IT)	BSC	3	1	0	4	30	70	100
2.	18EC332	Digital Principles and System Design	ESC	3	0	0	3	30	70	100
3.	18IT311	Object Oriented Programming	PCC	3	0	0	3	30	70	100
4.	18IT312	Operating systems (Common to IT& ME)	PCC	3	0	0	3	30	70	100
5.	18IT313	Data structures	PCC	3	0	0	3	30	70	100
MANDATORY COURSES										
6.	18MC051	Constitution of India (Common To All Branches)	MC	3	0	0	0	50	50	100
PRACTICAL										
7.	18IT321	Object Oriented Programming Laboratory	PCC	0	0	3	1	50	50	100
8.	18IT322	Operating Systems Laboratory	PCC	0	0	3	1	50	50	100
9.	18IT323	Data Structures Laboratory	PCC	0	0	3	1	50	50	100
10.	18HR351	Career Development Skills I (Common To All Branches)	EEC	0	2	0	0	50	50	100
		Total		**18**	**3**	**9**	**19**		**1000**	

SEMESTER - IV

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18MA441	Probability and Decision Models (Common To CS & IT)	BSC	3	1	0	4	30	70	100
2.	18IT411	Computer Organization (Common to IT& ME)	PCC	3	0	0	3	30	70	100
3.	18IT412	Database Management Systems (Common to IT& E)	PCC	3	0	0	3	30	70	100
4.	18IT413	Computer Networks	PCC	3	0	0	3	30	70	100
5.	18IT414	Design and Analysis of Algorithms	ESC	3	0	0	3	30	70	100
6.	18IT415	Software Engineering Principles and Practices	PCC	3	0	0	3	30	70	100
PRACTICAL										
7.	18IT421	Database Systems Laboratory	PCC	0	0	3	1	50	50	100
8.	18IT422	Computer Networks Laboratory	PCC	0	0	3	1	50	50	100
9.	18IT423	Design and Analysis of Algorithms Laboratory	ESC	0	0	3	1	50	50	100
10.	18HR462	Career Development Skills II	EEC	0	2	0	0	50	50	100
			Total	**18**	**3**	**9**	**22**		**1000**	

		K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215									CURRICULUM UG R - 2018

Department	Department of Information Technology
Programme	B.Tech - Information Technology

SEMESTER - V

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18EC532	Micro Controller and Embedded Systems	ESC	3	0	0	3	30	70	100
2.	18IT511	Data analytics	PCC	3	0	0	3	30	70	100
3.	18IT512	Theory of Computation	PCC	3	1	0	4	30	70	100
4.	18IT513	Java Programming (Common to IT,ME)	PCC	3	0	0	3	30	70	100
5.	18HS002	Total Quality Management (Common To AU,CS,EE,IT & ME)	HSMC	3	0	0	3	30	70	100
6.		Professional Elective - I	PEC	3	0	0	3	30	70	100
PRACTICAL										
7.	18EC027	Embedded Systems Laboratory	ESC	0	0	3	1	50	50	100
8.	18IT521	Data Analytics Laboratory	PCC	0	0	3	1	50	50	100
9.	18IT522	Java Programming Laboratory	PCC	0	0	3	1	50	50	100
10.	18HR563	Career Development Skills III	EEC	0	2	0	0	50	50	100
			Total	**18**	**3**	**9**	**22**		**1000**	

SEMESTER - VI

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18IT611	Web Technology	PCC	3	1	0	4	30	70	100
2.	18IT612	Software Testing	PCC	3	0	0	3	30	70	100
3.	18IT613	Principles of Compiler Design	PCC	3	0	0	3	30	70	100
4.		Professional Elective - II	PEC	3	0	0	3	30	70	100
5.		Professional Elective - III	PEC	3	0	0	3	30	70	100
6.		Open Elective - I	OEC	3	0	0	3	30	70	100
PRACTICAL										
7.	18IT621	Web Technology Laboratory	PCC	0	0	3	1	50	50	100
8.	18IT622	Compiler Design Laboratory	PCC	0	0	3	1	50	50	100
9.	18IT623	Mini project	PROJ	0	0	6	3	50	50	100
10.	18HR664	Career Development Skills IV	EEC	0	2	0	0	50	50	100
		Total		**18**	**3**	**12**	**24**		**1000**	

	K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215	CURRICULUM UG R - 2018
Department	Department of Information Technology	
Programme	B.Tech - Information Technology	

SEMESTER - VII

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.	18HS051	Professional Ethics (Common To All Branches)	HSMC	3	0	0	3	30	70	100
2.	18IT711	Mobile Application Development (Common to EE & IT)	PCC	3	0	0	3	30	70	100
3.	18IT712	Computer Graphics and Visualization	PCC	3	1	0	4	30	70	100
4.	18IT713	Cryptography and Network Security	PCC	3	0	0	3	30	70	100
5.		Professional Elective-IV	PEC	3	0	0	3	30	70	100
6.		Open Elective - II	OEC	3	0	0	3	30	70	100
PRACTICAL										
7.	18IT721	Mobile Application Development Laboratory	PCC	0	0	3	1	50	50	100
8.	18IT722	Computer Graphics Laboratory	PCC	0	0	3	1	50	50	100
			Total	**18**	**1**	**6**	**21**		**800**	

SEMESTER - VIII

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
1.		Professional Elective - V	PEC	3	0	0	3	30	70	100
2.		Professional Elective - VI	PEC	3	0	0	3	30	70	100
3.		Open Elective - III	OEC	3	0	0	3	30	70	100
PRACTICAL										
4.	18IT821	Project work	PROJ	0	0	12	6	50	50	100
			Total	**9**	**0**	**12**	**15**		**400**	

	K.S.R. COLLEGE OF ENGINEERING (Autonomous) **(Approved by AICTE & Affiliated to Anna University)** **K.S.R. Kalvi Nagar, Tiruchengode - 637 215**	**CURRICULUM** **UG** **R - 2018**
Department	Department of Information Technology	
Programme	B.Tech - Information Technology	

List of Electives

PROFESSIONAL ELECTIVE - I (SEMESTER - V)

Sl.No.	Course Code	Course Name	Specialization	Category	Hours/ Week			Credit	Maximum Marks		
					L	T	P	C	CA	ES	Total
1.	18IT561	Object Oriented Analysis and Design	S1	PEC	3	0	0	3	30	70	100
2.	18IT562	Artificial Intelligence	S2	PEC	3	0	0	3	30	70	100
3.	18IT563	Mobile Computing (Common to AU & IT)	S3	PEC	3	0	0	3	30	70	100
4.	18IT564	Unix Internals	S4	PEC	3	0	0	3	30	70	100
5.	18IT565	Agile Methodologies (Infosys Elective)	S5	PEC	3	0	0	3	30	70	100
6.	18IT566	Enterprise Resource and Planning	S1	PEC	3	0	0	3	30	70	100

PROFESSIONAL ELECTIVE - II (SEMESTER - VI)

Sl.No.	Course Code	Course Name	Specialization	Category	Hours/ Week			Credit	Maximum Marks		
					L	T	P	C	CA	ES	Total
1.	18IT661	Bio Informatics	S1	PEC	3	0	0	3	30	70	100
2.	18IT662	Cloud computing (Infosys Elective)(Common to EC,IT)	S1	PEC	3	0	0	3	30	70	100
3.	18IT663	Human Computer Interaction	S2	PEC	3	0	0	3	30	70	100
4.	18IT664	Service Oriented Architecture	S2	PEC	3	0	0	3	30	70	100
5.	18IT665	TCP / IP Protocol Suite	S3	PEC	3	0	0	3	30	70	100
6.	18IT666	Internet of Things (Infosys Elective)(Common to IT,ME)	S3	PEC	3	0	0	3	30	70	100

PROFESSIONAL ELECTIVE – III (SEMESTER - VI)

Sl.No.	Course Code	Course Name	Specialization	Category	Hours/ Week			Credit	Maximum Marks		
					L	T	P	C	CA	ES	Total
1.	18IT667	Wireless Communication	S1	PEC	3	0	0	3	30	70	100
2.	18IT668	Software Quality Assurance	S5	PEC	3	0	0	3	30	70	100
3.	18IT669	Social Network Analysis	S3	PEC	3	0	0	3	30	70	100
4.	18IT671	Machine Learning Techniques	S5	PEC	3	0	0	3	30	70	100
5.	18IT672	Open Source Software	S4	PEC	3	0	0	3	30	70	100
6.	18IT673	Tele Communication and Switching Techniques	S3	PEC	3	0	0	3	30	70	100

		PROFESSIONAL ELECTIVE – IV (SEMESTER – VII)									
Sl.No.	**Course Code**	**Course Name**	**Speciali zation**	**Category**	**Hours/ Week**			**Credit**	**Maximum Marks**		
					L	**T**	**P**	**C**	**CA**	**ES**	**Total**
1.	18IT761	Distributed Computing	S1	PEC	3	0	0	3	30	70	100
2.	18IT762	Enterprise Networking	S3	PEC	3	0	0	3	30	70	100
3.	18IT763	Digital Image Processing	S2	PEC	3	0	0	3	30	70	100
4.	18IT764	Quantum Computing	S1	PEC	3	0	0	3	30	70	100
5.	18IT765	Video Analytics (Common to CE,EE & IT)	S3	PEC	3	0	0	3	30	70	100
6.	18IT766	Business Intelligence and Applications	S5	PEC	3	0	0	3	30	70	100

		PROFESSIONAL ELECTIVE – V (SEMESTER - VIII)									
Sl.No.	**Course Code**	**Course Name**	**Speciali zation**	**Category**	**Hours/ Week**			**Credit**	**Maximum Marks**		
					L	**T**	**P**	**C**	**CA**	**ES**	**Total**
1.	18IT861	Pattern Recognition	S2	PEC	3	0	0	3	30	70	100
2.	18IT862	Green Computing	S5	PEC	3	0	0	3	30	70	100
3.	18IT863	Reasoning and Expert Systems	S1	PEC	3	0	0	3	30	70	100
4.	18IT864	Information Theory and Coding Techniques	S2	PEC	3	0	0	3	30	70	100
5.	18IT865	Wireless Sensor Networks	S4	PEC	3	0	0	3	30	70	100
6.	18IT866	Software Project Management	S5	PEC	3	0	0	3	30	70	100

		PROFESSIONAL ELECTIVE – VI (SEMESTER - VIII)									
Sl.No.	**Course Code**	**Course Name**	**Speciali zation**	**Category**	**Hours/ Week**			**Credit**	**Maximum Marks**		
					L	**T**	**P**	**C**	**CA**	**ES**	**Total**
1.	18IT867	Semantic Web	S2	PEC	3	0	0	3	30	70	100
2.	18IT868	Cyber Forensics	S3	PEC	3	0	0	3	30	70	100
3.	18IT869	Soft Computing	S4	PEC	3	0	0	3	30	70	100
4.	18IT871	C# and .Net Framework	S2	PEC	3	0	0	3	30	70	100
5.	18IT872	Next Generation Networks	S3	PEC	3	0	0	3	30	70	100
6.	18IT873	Information Storage And Retrieval	S2	PEC	3	0	0	3	30	70	100

SI.No.	Course Code	Course Name	Speciali zation	Category	Hours/ Week			Credit	Maximum Marks		
					L	T	P	C	CA	ES	Total
		OPEN ELECTIVES									
1.	18HS094	Disaster Management (Common to CE,CS & IT)	HS	OEC	3	0	0	3	30	70	100
2.	18EC093	Analog and Digital Communication (Common to EE & IT)	EC	OEC	3	0	0	3	30	70	100
3.	18ME776	Industrial Robotics (Common to CS,IT & ME)	ME	OEC	3	0	0	3	30	70	100
4.	18CE091	Basics of Civil and Mechanical Engineering (Common to CS,EE & IT)	CE	OEC	3	0	0	3	30	70	100
5.	18HS098	Human Resource Management (Common to CS & IT)	HS	OEC	3	0	0	3	30	70	100
6.	18HS095	Engineering Economics and Financial Accounting (Common to CS,EE & IT)	HS	OEC	3	0	0	3	30	70	100
7.	18EC662	Medical Electronics (Common to CS,EC & IT)	EC	OEC	3	0	0	3	30	70	100
8.	18CE096	Solid waste Management (Common to CS & IT)	CE	OEC	3	0	0	3	30	70	100
9.	18ME097	Industrial Safety Engineering (Common to CS & IT)	ME	OEC	3	0	0	3	30	70	100
10.	18EE413	Control Systems (Common to EE & IT)	EE	OEC	3	0	0	3	30	70	100
11.	18EC763	Fundamentals of Nano Electronics	EC	OEC	3	0	0	3	30	70	100
12.	18HS001	Principles of Management (Common to All Branches)	HS	OEC	3	0	0	3	30	70	100
13.	18CE867	Municipal Waste and Management (Common to CE,CS,EE,IT & ME)	CE	OEC	3	0	0	3	30	70	100
14.	18AU769	Intelligent Vehicles Technology (Common to CS & IT)	AU	OEC	3	0	0	3	30	70	100
15.	18CE866	Architecture Planning Aspects (Common to CE,CS,EE,IT & ME)	CE	OEC	3	0	0	3	30	70	100

S1 - Recent Technologies and Computing   S2 - Data and Knowledge Engineering

S3 - Computer Networks and Security   S4 - Systems and Software Engineering

S5 - Entrepreneurship and Managerial Skills

LIST OF VALUE ADDED COURSES

Sl. No.	Course Name	Number of Hours	Offered by Internal / External
1	Business English Certification	15	Internal / External
2	Hands on Training on Hadoop	15	Internal / External
3	Computer Hardware and Troubleshooting	15	Internal / External
4	Infosys Campus Connect - Foundation Program	15	Internal / External
5	Online Course Certification for Software Testing	15	Internal/ External
6	Hands-on Training on Network Simulation Tools like NS3 etc.,	15	Internal / External
7	Hands-on Training on Data Mining Tools like Weka etc.,	15	Internal / External
8	Hands-on Training on Android Application Development	15	Internal / External
9	Hands-on Training on MATLAB	15	Internal / External
10	Hands-on Training on RedHat Linux	15	Internal/ External
11	Course on Google App Scripting	15	Internal / External

COURSE COMPONENT SUMMARY

S. No.	Subject Area	Credits Per Semester								Credits Total	Percentage Credits
		I	II	III	IV	V	VI	VII	VIII		
1.	HSMC	3	3	-	-	3	-	3	-	12	7.5
2.	BSC	8	8	4	4	-	-	-	-	24	15.0
3.	ESC	8	3	3	4	4	-	-	-	22	13.76
4.	PCC	-	5	12	14	12	12	12	-	67	41.61
5.	PEC	-	-	-	-	3	6	3	6	18	11.18
6.	OEC	-	-	-	-	-	3	3	3	9	5.62.
7.	PROJ	-	-	-	-	-	3	-	6	9	5.62
TOTAL		19	19	19	22	22	24	21	15	161	100

Total No. of Credits = 161

C. S. P.
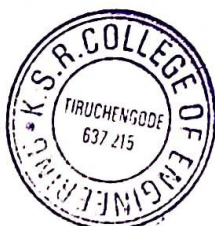
Chairman (BoS)

Dr. G. Singaravel
Professor & Head
Department of Information Technology
K.S.R. College of Engineering (Autonomous)
Tiruchengode - 637 215
Namakkal (Dt), Tamilnadu, India.

PRINCIPAL,
K.S.R. COLLEGE OF ENGINEERING,
TIRUCHENGODE - 637 209.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER - I</u>

18EN151	**TECHNICAL ENGLISH – I** (Common to all branches)	L 2	T 0	P 1	C 3

Prerequisite: *No prerequisites are needed for enrolling into the course*

Objectives:

- *To develop basic conversation skills.*
- *To build vocabulary skills with the right choice of words.*
- *To improve students' understanding of grammar in context progressively.*
- *To empower students on professional writing*
- *To use the LSRW skills in professional context*

UNIT – I   **[9]**

Synonyms & Antonyms - Tenses (Simple Present, Present Continuous, Present Perfect, Simple Past, and Simple Future) - Use of Modal Auxiliaries - Infinitive and Gerund -- Intensive Reading - Predicting Content - Interpretation - Active Listening - Listening for the main idea - Need based Correspondence (request for joining hostel, bonafide certificate)

UNIT – II   **[9]**

British & American Terminology - Impersonal passive - Standard Abbreviations and Acronyms - Predicting Content - Drawing inferences - Listening for specific details - Listening to News - Job Application and Resume - Writing Instructions

UNIT – III   **[9]**

Preposition of Time, Place and Movement - Concord (Subject & Verb Agreement) - Passive Voice -Consonant Sounds - Pronunciation guidelines related to Vowels and Consonant - Skimming & Scanning - Inference - Context Based Meaning - Welcome Speech - Vote of Thanks.

UNIT – IV   **[9]**

Newspaper Reading - Vocabulary Building - Phrasal Verbs (Put, Give, Look, Take, Get, Call) - Note making - Rearranging the jumbled sentences - MoC - Anchoring - Role play in academic context - E Mail Etiquette - Introducing others.

UNIT – V   **[9]**

Listening to Dialogues - Listening to Telephonic Conversation - Recommendation Writing - Letter of Invitation (inviting, accepting and declining) - Paragraph writing - Letter to the Editor of a News paper - Drills using Minimal pairs - Presentation Skills.

Total = 45 Periods

Course Outcomes : On Completion of this course, the student will be able to

CO1: *Comprehend and apply Grammar in context for professional communication.*

CO2: *Infer the gist and specific information.*

CO3: *Ability to speak, express and interact in the society and place of study.*

CO4: *Critically interpret by reading a text and comprehend a given text.*

CO5: *Correspond and communicate for jobs.*

Text Books :

1   Dr.P.Rathna, English Work Book - I, VRB Publishers Pvt. Ltd., Chennai,2018

2   S.Sumant, Technical English - I, Vijay Nicole, Chennai, 2018

Reference Books :

1   Meenakshi Raman. Technical Communcation, Oxford University Press, New Delhi, 2017

2   Seely, The Oxford Guide to Writing and Speaking, Oxford University Press, New Delhi, 2016

3   M Ashra Rizvi, Effective Technical Communication, Tata McGRAW HILL, New Delhi (2005)

4   P.Kiranmani Dutt, A course in Communication Skills,Cambridge University Press, New Delhi, 2014

K.S.R. COLLEGE OF ENGINEERING (Autonomous)
R 2018
SEMESTER – I

		L	T	P	C
18MA151	**ENGINEERING MATHEMATICS – I** (Common To All branches)	3	1	0	4

Prerequisite: No prerequisites are needed for enrolling into the course.

Objectives:
- *To study the concepts of Matrices and its Applications.*
- *To study the concepts and its applications of Ordinary Differential Equations*
- *To acquire knowledge in solving differential calculus.*
- *To study the concepts of functions of several variables*
- *To acquire the basics of Vector Calculus and its applications.*

UNIT – I   LINEAR ALGEBRA   [12]

Characteristic equation - Eigen values and Eigen vectors of a real matrix - Properties of Eigen values and Eigen vectors (Excluding proof) - Cayley Hamilton theorem (excluding proof) - Quadratic forms - Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT – II   ORDINARY DIFFERENTIAL EQUATIONS   [12]

Linear differential equations of second and higher order with constant coefficients - Differential equations with variable coefficients - Cauchy"s and Legendre"s linear equations - Method of variation of parameters.

UNIT – III   DIFFERENTIAL CALCULUS   [12]

Curvature - Radius of curvature (Cartesian co-ordinates only) - Centre of curvature and Circle of curvature - Involutes and Evolutes.

UNIT – IV   FUNCTIONS OF SEVERAL VARIABLES   [12]

Partial derivatives - Total derivatives - Euler"s theorem for homogenous functions - Taylor"s series expansion - Maxima and Minima for functions of two variables - Method of Lagrangian multipliers.

UNIT – V   VECTOR CALCULUS   [12]

Gradient, Divergence and Curl - Directional derivative - Irrotational and solenoidal vector fields - Green"s theorem in plane, Gauss divergence theorem and Stoke"s theorem - Problems in Cube, Cuboid and Rectangular paralleopiped only.

Total (L: 45 T:15) = 60 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Interpret the basics of Matrix applications in the field of engineering.
CO2: Acquire knowledge in solving ordinary differential equations.
CO3: Explain and apply the concepts of differential calculus problems.
CO4: Skills in developing and solving the functions of several variables.
CO5: Acquire the basics of vector calculus and its applications

Text Books :

1 Ravish R Singh and Mukul Bhatt, Engineering Mathematics - I, McGraw Hill Publications, Third Edition, New Delhi 2016.
2 Grewal B.S, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company, Forty Three Edition, New Delhi, 2015.

Reference Books :

1 Bali N. P and Manish Goyal, Engineering Mathematics, Laxmi Publications (p) Ltd., Seventh Edition, 2016.
2 Dass H.K, Advance Engineering Mathematics, S. Chand and company, Eleventh Edition, 2015.
3 Jain R.K. and Iyengar S.R.K., - Advanced Engineering Mathematics, Narosa Publicaitons, Eigth Edition, 2012.
4 http://www.sosmath.com/matrix/matrix.html

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER – I

18CH051	**ENGINEERING CHEMISTRY** **(Common to All Branches)**	L 3	T 0	P 0	C 3

Prerequisite: NIL.

Objectives:
- *To Impart knowledge about the manufacture, properties and uses of advanced engineering materials*
- *To acquaint the students with the basic concepts of corrosion mechanism and its control*
- *To understand the concept of thermodynamics*
- *To gain knowledge about atomic structure and chemical bonding*
- *To make the students conversant with various spectroscopic techniques*

UNIT – I   ADVANCED ENGINEERING MATERIALS   [9]

Abrasives - Moh"s scale of hardness - types - natural [Diamond] - synthetic [SiC]; Refractories - characteristics - classifications [Acidic, basic and neutral refractories] - properties - refractoriness - RUL - porosity - thermal spalling; Lubricants - definition - function - characteristics - properties - viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants - graphite and MoS_2; Nano materials - CNT- synthesis [CVD, laser evaporation, pyrolysis] - applications - medicine, electronics, biomaterials and environment.

UNIT – II   ELECTROCHEMISTRY AND CORROSION   [9]

Introduction - electrode potential - Nernst equation - EMF series and its significance - types of cells (Electrolytic & electrochemical); Corrosion - causes, consequences - classification - chemical corrosion - electro chemical corrosion - mechanism; Galvanic & differential aeration corrosion - factors influencing corrosion - corrosion control - corrosion inhibitors.

UNIT – III   CHEMICAL THERMODYNAMICS   [9]

Terminology of thermodynamics - second law; Entropy - entropy change for an ideal gas - reversible and irreversible processes - entropy of phase transition - Clausius inequality; Free energy and work function - Helmholtz and Gibb"s free energy functions (Problems) - criteria of spontaneity; Gibb"s - Helmholtz equation (Problems) - Clausius-Clapeyron equation; Maxwell"s relations - Van"t Hoff isotherm and isochore (problems).

UNIT – IV   ATOMIC STRUCTURE AND CHEMICAL BONDING   [9]

Effective nuclear charge - orbitals - variations of s, p, d and f orbital - electronic configurations - ionization energy - electron affinity and electro negativity; Types of bonding - ionic, covalent and coordination bonding - hydrogen bonding and its types; Crystal field theory - the energy level diagram for transition metal complexes ($[Fe(CN)_6]^{3-}$, $[Ni(CN)_4]^{2-}$ and $[CoCl_4]^{2-}$ only); Role of transition metal ions in biological system; Band theory of solids.

UNIT – V   PHOTOCHEMISTRY AND SPECTROSCOPIC TECHNIQUES   [9]

Laws of photochemistry - Grotthuss Draper law - Stark-Einstein law - Beer-Lambert law - phosphorescence - fluorescence and it"s applications in medicine - chemiluminescence; Colorimetry - principle - instrumentation (block diagram only) - estimation of iron by colorimetry; principles of spectroscopy - selection rules - vibrational and rotational spectroscopy - applications; Flame photometry - principle - instrumentation (block diagram only) - estimation of sodium; Atomic absorption spectroscopy - principle - instrumentation (block diagram only) - estimation of nickel.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
>   *CO1: Make use of the manufacture, properties and uses of advanced engineering materials.*
>   *CO2: Recognize the knowledge on the concept of corrosion and its control.*
>   *CO3: Assess knowledge about thermodynamics.*
>   *CO4: Rationalize periodic properties such as ionization energy, electron affinity and electro negativity.*
>   *CO5: Recognize the usage of various spectroscopic techniques.*

Text Books :

1   Dr. A. Ravikrishnan, Engineering Chemistry, Srikrishna Hi-tech Publishing Company Private Limited, Chennai, Seventeenth Edition, 2016.

2   P.C. Jain and Monica Jain, Engineering Chemistry, Dhanpat Rai Publishing company, New Delhi, Seventeenth Edition, 2015.

Reference Books :

1   S S. Dara and S. S. Umare, A Text book of Engineering Chemistry, S. Chand & Company Limited, New Delhi, Fifth Edition, 2015.

2   N. Krishnamurthy, P. Vallinayagam and D. Madhavan, Engineering Chemistry, PHI Learning Private Limited, New Delhi, Third Edition, 2014.

3   B. Sivasankar, Engineering Chemistry, Tata McGraw - Hill Education Private Limited, New Delhi, First Edition, 2008

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

SEMESTER – I

18EE041	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
	(Common To AU, CE, CS, IT & ME)	3	0	0	3

Prerequisite: *Engineering Mathematics, Engineering Physics*

Objectives:

- To study the basic concepts of electric circuits and various measuring instruments.
- To familiarize the constructional details and operation of the DC machines and transformers.
- To impart knowledge on AC Motors and special electrical machines.
- To understand the basic of various measuring instruments.
- To study the characteristics of semiconductor devices and its applications.

UNIT – I   ELECTRICAL CIRCUITS   [9]

Structure of Electrical Power System- Ohm"s Law - Kirchhoff"s Laws - Circuit Analysis - Introduction to AC Circuits: R, RL & RLC series circuits (Quantitative Approach Only), Average and RMS Value - Power factor for single phase Circuits - Three Phase Star and Delta Connections - Electrical Safety.

UNIT – II   DC MOTORS AND TRANSFORMERS   [9]

Faraday"s Law - Lenz"s Law-Fleming"s left hand and right hand rule, DC Motors: Construction -Operation - Series and Shunt Motor - Characteristics - Applications. Single Phase Transformer: Construction - Operation - EMF Equation - Types – Applications.

UNIT – III   AC MOTORS & SPECIAL MACHINES   [9]

Single Phase Induction Motor: Construction - Operation - Split Phase Induction Motor and Capacitor Start Induction Run Motor - Applications, Three Phase Induction Motor: Construction - Operation - Types - Applications. Special Machines: Stepper Motor.

UNIT – IV   MEASURING INSTRUMENTS   [9]

Basic Methods of Measurements: Direct and Indirect , Functional elements of an instrument - Errors in measurements - Analog and Digital Instruments - Basic Principle of Indicating Instruments - Moving Coil and Moving Iron Ammeter and Voltmeter. Dynamometer type Wattmeter - Induction type Energy Meter - Cathode Ray Oscilloscope.

UNIT – V   ANALOG AND DIGITAL ELECTRONICS   [9]

Semiconductor devices: PN Junction Diode, Zener diode: classification, operation and Characteristics- Bipolar Junction Transistor - CE Configurations and its Characteristics. Review of number systems - digital logic gates - Introduction to Microprocessors.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Solve the electric circuits by applying basic circuital laws using various combinations of circuit elements.
CO2: Explain the construction, operating principle and application of DC motor, transformers.
CO3: Enlighten the construction, operating principle and application of AC motors.
CO4: Illustrate the function of various measuring instruments.
CO5: Discuss the characteristics of Diodes, Zener diode, BJT using CE configurations

Text Books :

1 Smarajit Ghosh,Fundamentals of Electrical and Electronics Engineering, PHI Learning Private Limited, New Delhi, Second Edition, 2007.
2 V.Jegathesan, K.VinothKumar and R.Saravanakumar,Basic Electrical and Electronics Engineering, Wiley India Publication, New Delhi, First Edition, 2012.

References :

1 Muthusubramanian,R., Salivahanan S and Muraleedharan, K.A., Basic Electrical, Electronics and Computer Engineering, Tata McGraw Hill Publishing Co Ltd., New Delhi, Second Edition, 2006.
2 Nagsarkar T K and Sukhija M S,Basics of Electrical Engineering, Oxford University Press, London, Ninth Edition, 2005.
3 Mehta, V.K and Rohit Mehta, Principle of Electrical Engineering, S Chand & Company, New Delhi, Second Edition 2008.
4 Mahmood Nahvi and Joseph A. Edminister, Electric Circuits, Schaum" Outline Series, Tata McGraw Hill Publishing Co Ltd., New Delhi, Fifth Edition, 2002.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　**R 2018**

SEMESTER - I

18IT111	**PROGRAMMING FOR PROBLEM SOLVING USING C**	L	T	P	C
		3	0	0	3

Prerequisite: *Fundamental knowledge in Problem Solving Techniques.*

Objectives:

- *To acquire knowledge about problem solving in computers*
- *To understand and implement the fundamentals concepts in C program*
- *To learn arrays and Strings*
- *To understand about Functions and Pointers*
- *To illustrate the importance of Structures and Pointers*

UNIT – I　　　**INTRODUCTION TO COMPUTER PROBLEM SOLVING**　　　　**[9]**

Introduction to computer and problem solving: Overview of computers - Applications of computers - Characteristics of computer - Basic computer organization - Number System - Problem solving - Planning the computer Program - algorithm - Flowchart - Pseudo codes. Case Study on Problem Solving: Exchanging values of two variables - Find largest number - Summation of a set of numbers - Reversing digits of an integer - Factorial computation - Fibonacci sequence – Reversing the numbers

UNIT – II　　　**INTRODUCTION TO C LANGUAGE AND CONTROL**　　　　**[9]**

C Program Development Environment - Writing Portable C Code - C Program Structure - Character Set - Keywords - Data Types and Sizes - Constants - Variables - Operators - Conditional Expression - Branching: If-Else Statement - Nested If Statement - Switch Case - Looping: While - Do-While - For - Nested Control Structures - Break - Continue – Goto Statement

UNIT – III　　　**ARRAYS AND STRINGS**　　　　**[9]**

Single Dimensional Array - Strings - Two Dimensional Arrays - Array of Strings - Multidimensional Array: Initialization - Unsized Array Initialization - Variable Length Arrays Defining a string - NULL character - Initialization of Strings - String functions – Storage Classes – Scope Rules

UNIT – IV　　　**FUNCTIONS AND POINTERS**　　　　**[9]**

Definition of Function - Prototypes - Recursion - Command Line Argument - Calling Function: Call by Value - Call by Address - Return Statement - Passing Arrays to Function - Pointer Declaration - Operations On Pointer - Passing Pointers to a Function - Pointers and One Dimensional - Multidimensional Array - Array of Pointers - Function Pointers - Dynamic Memory Allocation

UNIT – V　　　**STRUCTURES UNIONS AND FILES**　　　　**[9]**

Structures and Unions: Defining a Structure - Processing a Structure - Structures and Functions - Array of structures - Arrays within structures - User defined data types (Typedef) - Unions - Files: Opening and Closing a Data File - Reading and Writing a data file - Processing a data file - Unformatted data files - Concept of binary files - Accessing a file randomly using fseek

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
  CO1: Analyze the fundamentals of problem solving
  CO2: Illustrate the design of efficient algorithms for basic operations
  CO3: Design the programs using factoring methods
  CO4: Summarize array techniques for problem solving
  CO5: Solve different algorithms for solving a given problem

Text Books:

1　Byron S Gottfried and Jitendar Kumar Chhabra, Programming with C, Tata McGraw Hill Publishing Company, Third Edition, 2011.

2　PradipDey and ManasGhosh , Programming in C, Second Edition, Oxford University Press, 2011.

Reference Books :

1　Ashok N.Kamathane,Computer Programming, Pearson Education, 2014.

2　Maureen Sprankle , Problem Solving and Programming Concepts ,Pearson 7th Edition, 2011.

3　Elizabeth A Dickson,Computer Program Design, McGraw-Hill- International Edition, 2002.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – I</u>

18CH028	**CHEMISTRY LABORATORY**	L	T	P	C
	(Common to All Branches)	0	0	3	1

Prerequisite: *Knowledge of Engineering Chemistry*

Objectives:

- *To gain the practical knowledge and hands on experiences of understanding the principle of conductometric titration.*
- *To acquaint the students with the estimation of iron by spectrophotometry.*
- *To analyze the instrumental methods of chemical analysis.*
- *To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.*
- *To impart knowledge about the theoretical principles of corrosion in metals.*

LIST OF EXPERIMENTS:

1. Conductometric Titration - Strong Acid Vs. Strong Base.

2. Conductometric Titration - Mixture of Weak and Strong Acids Vs. Strong Base.

3. Conductometric Titration - Precipitation, $BaCl_2$ Vs. Na_2SO_4.

4. Estimation of Ferrous ion by Potentiometry - Fe^{2+} Vs $K_2Cr_2O_7$.

5. Estimation of Hydrochloric Acid by pH metry.

6. Estimation of Iron by Spectrophotometry.

7. Estimation of hardness in water by EDTA method.

8. Estimation of chloride in water sample by Argentometry.

9. Estimation of dissolved oxygen (DO) in water by Winkler"s method.

10. Determination of rate of corrosion of mild steel by weight loss method

Total = 30 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Apply the principle of conductometric titration
CO2: Determine the role of pH in quantitative analysis of a solution
CO3: Perceive the knowledge of the concentration of Iron by electrochemical methods
CO4: Analyze the application of water in various fields
CO5: Identify the nature of corrosion process

Text Book :

1   Chemistry Lab Manual, Department of Chemistry, K.S.R. College of Engineering, Tiruchengode, 2018

2   I. Vogel, Vogel"s Textbook of Quantitative Chemical Analysis, John Wiley & sons, Newyork, Eighth Edition, 2014

Reference Books :

1   S. K. Bhasin and Sudha Rani, Laboratory Manual of Engineering Chemistry, Dhanpat Rai Publishing Company Private Limited, New Delhi, Third Edition, 2012

2   I. Vogel and J. Mendham, Vogel"s Textbook of Quantitative Chemical Analysis, Harlow, Prentice Hall, Sixth Edition, 2000

3   G.H. Jeffery, J. Bassett, J. Mendham and R.C. Denny, Vogel"s Text book of quantitative analysis chemical analysis, Longman, Singapore publishers, Singapore, ELBS Fifth Edition, 1996

4   B.S. Furniss, A.J, Hannaford, P.W.G. Smith and A.R. Tatchel, Vogels Textbook of practical organic chemistry, John Wiley & sons, Newyork, Fifth Edition, 1989

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER –I**</u>

		L	T	P	C
18IT121	**PROGRAMMING FOR PROBLEM SOLVING LABORATORY**	0	0	3	1

Prerequisite: Fundamental knowledge in problem solving techniques

Objectives:

- *To understand the basic programming constructs*
- *To articulate how they are used to develop a program with a desired runtime execution flow*
- *To understand where computer programs fit in the provision of computer based solutions to real world problems*
- *To learn to use user defined data types*
- *To gain knowledge on recursion*

LIST OF EXPERIMENTS:

1. Design an algorithm for exchanging the Values.

2. Design an algorithm and Draw a flowchart for Factorial Computation.

3. Design an algorithm and Draw a flowchart for check whether the given number is a prime number.

4. To write a program for finding the roots of a quadratic equation.

5. To Write a Program using Decision Making Constructs.

6. To write a program for finding the given year is leap year or not.

7. To design a calculator to perform the operations namely addition, subtraction, multiplication and division.

8. To generate the internal marks of students for five different subjects using structures.

9. To check whether the given string is palindrome or not without using string handling functions.

10. To write a program for calculating factorial using recursion and non recursive functions.

11. To swap the values of two variables using pointers.

Total = 45 Periods

Course Outcomes: On Completion of this course , the student will be able to

CO1: Illustrate the   basic programming concept of C
CO2: Illustrate the concept of Structured Programming
CO3: Identify suitable data structure for solving a problem
CO4: Demonstrate the use of conditional statement
CO5: Analyze the concept of structures and unions

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

<u>**SEMESTER – I**</u>

18AU027	**ENGINEERING GRAPHICS LABORATORY**	L	T	P	C
	(Common To CE,CS,EC,EE & IT)	0	0	3	1

Prerequisite: *No Prerequisites are needed for enrolling into the course.*
Objective:
- *To improve graphic skills for communication of concepts, ideas, and design of engineering product*
- *To develop skill for using software to create 2D and 3D models*
- *To become proficient in drawing the projection of various solids*
- *To gain knowledge about orthographic and isometric projections*
- *To improve their visualization skills so that they can apply these skills in developing new products*

List of Experiments:
1. Study of basic tools, commands and coordinate system (absolute, relative, polar, etc.) used in 2D software.
2. Draw the conic curves and special curves by using AutoCAD.
3. Draw the front view, top view, side view of objects from the given pictorial view.
4. Draw the projections of straight lines.
5. Draw the projections of polygonal surface.
6. Draw the projections of simple solid objects.
7. Draw the sectional view and the true shape of the given section.
8. Draw the development of surfaces like prism, pyramids, cylinders and cone.
9. Draw the isometric projections of simple solids, truncated prism and pyramids.
10. Draw the isometric projections of cylinder and cone.

Total = 45 Periods

Course Outcomes: *On completion of this course, the students will be able to*
　　CO1: Construct the various plane curves
　　CO2: Formulate orthographic projection of lines and plane surfaces
　　CO3: Draw projections of solids and development of surfaces
　　CO4: Prepare the isometric sections of simple solids
　　CO5: Develop the section of solids and surfaces

K.S.R. COLLEGE OF ENGINEERING (Autonomous) **R 2018**

SEMESTER - II

TECHNICAL ENGLISH – II

18EN251 (Common to all branches)

L	T	P	C
2	0	1	3

Prerequisite: *No prerequisites are needed for enrolling into the course*

Objectives:

- *To make students firm on vocabulary and grammar.*
- *To develop students speaking ability*
- *To enhance students' professional skills on professional writing.*
- *To enable students reading and listening skills.*
- *To optimize LSRW skills for personal development*

UNIT – I **[9]**

Technical Vocabulary - Changing words from one form to another - Articles - Compound Nouns - Critical reading - Need based Correspondence (In plant training & Industrial Visit) - Context based meaning - Introducing Oneself - Writing short Essays.

UNIT – II **[9]**

Numerical Adjectives - Prefixes & Suffixes- If Conditionals - E-mail Writing - Greetings and Introductions - Making Requests - Seeking Information - Inviting People - Likes & Dislikes -. Listening for main ideas - Report Writing.

UNIT – III **[9]**

Framing Questions - „Wh" Question - Yes / No Question -Discourse markers - Cause and Effect Expression - Critical reading, Making inference - Transcoding (Interpretation of Charts) - Listening and Note taking - Oral Presentation.

UNIT – IV **[9]**

Expression of Purpose - Editing text for Spelling and Punctuation - Redundancies - Business Correspondence - Calling for Quotations, Seeking Clarification, placing order and Complaint - Extensive Listening - Short Comprehension Passages.

UNIT – V **[9]**

Instructions - Describing - Telephone Etiquette - Listening to fill up forms and gapped texts - Agenda and Minutes of meeting - Check list - Essay Writing - Reading Short texts from Journals and Newspapers.

Total = 45 Periods

Course Outcomes : On Completion of this course, the student will be able to

CO1: Comprehend and apply the enriched vocabulary, by knowing the basic grammatical structure, in academic and professional contexts.

CO2: Recognize and use Standard English in diverse situations.

CO3: Critically interpret by reading a text and comprehend a given text.

CO4: Able to write clearly in professional contest.

CO5: Enhance the listening skill for academic purposes.

Text Books :

1 Dr.P.Rathna, English Work Book - II, VRB Publishers Pvt. Ltd., Chennai,2016

2 S.Sumant, Technical English - I, Vijay Nicole, Chennai, 2018

Reference Books :

1 Dr.S.Sumant,Technical English I, Tata McGraw Hill, Chennai (2016).

2 Dept. of Humanities and social sciences, Anna University, Chennai, English for Engineers and Technologists, Orient Longman, 2014

3 HorySankarMukerjee, Business Communication, Oxford University Press, New Delhi (2013).

4 Department of English, English for Technologists and Engineers, Orient Black Swan, Chennai (2016).

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – II</u>

	DISCRETE MATHEMATICS	L	T	P	C
18MA243	(Common To CS & IT)	3	1	0	4

Prerequisite: No prerequisites are needed for enrolling into the course.

Objectives:
- *To study the concepts needed to test the logic of a program.*
- *To study the concepts and acquire knowledge of Discrete Mathematical Structures in the areas of Predicate Calculus*
- *To acquire knowledge of various set theoretic concepts.*
- *To gain the knowledge in functions.*
- *To study the basics of Graph theory and Combinatorics and its applications in the field of Computer Science and Information Technology.*

UNIT – I   PROPOSITIONAL CALCULUS   [12]

Propositions - Logical connectives - Compound propositions - Conditional and biconditional propositions - Truth tables- Tautologies and contradictions - Contra positive - Logical equivalences and implications - Normal forms - Principal conjunctive and disjunctive normal forms – Rules of inference Theory.

UNIT – II   PREDICATE CALCULUS   [12]

Predicates - Statement functions - Variables - Free and bound variables - Quantifiers - Universe of discourse - Logical equivalences and implications for quantified statements - Theory of inference - The rules of universal specification and generalization.

UNIT– III   SET THEORY   [12]

Cartesian product of sets - Relation on sets - Types of relations and their properties - Relational matrix and the graph of a relation -Equivalence relations - Partial ordering - Poset - Hasse diagram.

UNIT – IV   FUNCTIONS   [12]

Definition - Classification of functions -Composition of functions - Inverse functions - Binary and n-ary operations - Characteristic function of set – Permutation functions.

UNIT – V   GRAPH THEORY AND COMBINATORICS   [12]

Graphs: Graph terminology and special types of graphs - Representing graphs and graph isomorphism - connectivity - Euler and Hamilton paths - Matching. Combinatorics: Mathematical Induction - The Basics of Counting - Pigeonhole Principle - Recurrence Relations – Generating Functions.

Total (L: 45 T: 15) = 60 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Using mathematical techniques to solve logical problems.
CO2: Construct algorithms and derive complexities.
CO3: Acquire the knowledge of sets that are required for developing computational models.
CO4: Perform computational operations associated with functions.
CO5: Apply the concepts of Graph theory and Combinatorics in network algorithms.

Text Books :

1 Trembly J.P, and Manohar R, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw-Hill Publishing Co. Ltd, New Delhi, Forty third Re-print 2014.

2 Venkatraman.M.K, Sridharan.N and Chandrasekaran.N. Discrete Mathematics, The National Publishing Company, Chennai, Fourth Edition 2014.

Reference Books :

1 Kenneth. H. Rosen, Discrete Mathematics and its Applications, Tata McGraw-Hill Publishing Co. Ltd, New Delhi , Seventh Edition,2013

2 Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, Discrete Mathematical Structures, Pearson Education Pvt Ltd., New Delhi, 2013, Sixth Indian reprint.

3 Subramanian.N, Discrete Mathematics, SCM Publications, Fifth edition, 2018.

4 https://www.youtube.com/watch?v=DmCltf8ypks

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER – II

			L	T	P	C
18PH043	**ENGINEERING PHYSICS** (Common to CS,EC,EE & IT)		3	0	0	3

Prerequisite: Basic knowledge on physics

Objectives:
- *To compute and analyze various problems related to Engineering Physics.*
- *To understand the various optoelectronic devices and its applications in the field of Engineering and also to explore the prism concepts of Quantum physics.*
- *To emphasize the basic concepts behind the types of advanced materials & nanotechnology.*
- *To explore the basic concepts behind the sensors, transducers and Laser.*
- *To comprehend the fundamentals of physics thereby exploring it for potential engineering applications.*

UNIT – I   QUANTUM PHYSICS   **[9]**

Black body radiation - Planck"s theory (derivation) - Deduction of Wien"s displacement law and Rayleigh - Jeans" Law from Planck"s theory - Compton effect - Theory and experimental verification - Matter waves - Schrödinger"s wave equation - Time independent and time dependent equations - Physical significance of wave function - Particle in a one dimensional box, Scanning Electron Microscopy (SEM),Transmission Electron Microscopy (TEM), .

UNIT – II   OPTOELECTRONIC DEVICES   **[9]**

Photoconductive materials - Light Dependent Resistor (LDR) - Working - Applications - Photovoltaic materials - Solar cell - Construction, working and applications - Light Emitting Diode (LED) - Principle, construction and working - Liquid crystal Display (LCD) – Types and applications.

UNIT – III   ADVANCED MATERIALS AND NANOTECHNOLOGY   **[9]**

New Engineering Materials: metallic glasses - preparation, properties and applications - Shape memory alloys (SMA) - characteristics, properties of Ni Ti alloy applications - advantages and disadvantages of SMA.Nanomaterials: Properties-Top-down process: Ball Milling method - Bottom-up process: Vapour Phase Deposition method- Carbon nano tube (CNT): Properties, preparation by electric arc method, Applications

UNIT – IV   LASER TECHNOLOGY   **[9]**

Introduction - Principle of Spontaneous emission and stimulated emission - Population inversion, pumping - Einstein"s A and B coefficients (derivation). Types of lasers - Nd-YAG, CO_2 and Semiconductor lasers (homo-junction and hetero-junction) - Qualitative Industrial Applications: Lasers in welding, heat treatment and cutting - Medical applications - Holography (construction and reconstruction).

UNIT – V   SENSOR TECHNOLOGY   **[9]**

Definition - Principle of sensor & transducer - classification - types of Sensors - resolution, accuracy, sensitivity, - Inductive sensor- Linear Variable Differential Transistor (LVDT) - Thermal sensors - Thermocouple - Magnetic sensors - Strain gauge torque meters - biosensors - electronic nose -electronic tongue - medical, food and agricultural applications.

         Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Enumerate the preambles of quantum physics and implement its concepts to tackle the cumbersome engineering problems.

CO2: Explore the concepts of optoelectronic devices for the fabrication of electronic devices.

CO3: Apply the techniques for manufacturing of advanced materials aided with Nano properties

CO4: Categorize the types of laser and utilize it for specific application based on their desirable requisite.

CO5: Utilize the conceived concepts and techniques for sensors and transducers.

Text Books :

1. R. Murugasen and Er. KiruthigaSivaprasath,""Modern Physics"" S. Chand & Co, New Delhi 2018.
2. Dr.M. Arumugam, "Engineering Physics",Anuradha Publications, Kumbakonam,2017.

Reference Books :

1. R.K.Gaur&S.L.Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 2014.
2. A.K.Sawhney, "A Course in Electrical and Electronic Measurements and Instrumentation",Dhanpat rai &Co Delhi, 2012.
3. www.fadooengineers.com

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - II

		L	T	P	C
18IT211	**PYTHON PROGAMMING**	3	0	0	3

Prerequisite: Fundamental knowledge in c programming

Objectives:

- *To acquire knowledge about python*
- *To understand and implement the fundamentals concepts in a program*
- *To design algorithm for various problems*
- *To learn about python Fundamentals*
- *To illustrate the importance of files and lists*

UNIT – I   DATA EXPRESSIONS STATEMENTS   [9]

Python interpreter and interactive mode values and types: int - float - Boolean - string - list - variables - Expressions - Statements - Tuple assignment - Precedence of operators - Comments - Modules and functions: Function definition and use - Flow of execution - Parameters and arguments - Illustrative programs: Exchange the values of two variables - Circulate the values of n variables - Distance between two points

UNIT – II   CONTROL FLOW FUNCTIONS   [9]

Conditionals: Boolean values and operators - Conditional (if) - Alternative (if-else) - Chained conditional (if-elif-else). Iteration: State - While - for - Break - Continue - Pass. Fruitful functions: return values - Parameters - Local and global scope - Function composition - Recursion

UNIT – III   STRINGS AND LISTS   [9]

Strings: string slices - Immutability - String functions and methods - String module - Lists as arrays. Illustrative programs: square root - gcd - Exponentiation - Sum of array of numbers - Linear search - binary search. Lists: list operations - List slices - List methods - List loop - Mutability - Aliasing - Cloning lists - List parameters

UNIT – IV   TUPLES AND DICTIONARIES   [9]

Tuples: tuple assignment - Tuple as return value - Dictionaries: operations and methods - Advanced list processing - List comprehension - Illustrative programs: selection sort - Insertion sort - Merge sort - Histogram

UNIT – V   FILES AND PACKAGES   [9]

Files and exception: Text files - Reading and writing files - Format operator - Command line arguments - Errors and exceptions - Handling exceptions - Modules - Packages - Illustrative programs: Word count - Copy file

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Discuss the fundamentals of Data Expression Statements
CO2: Construct the algorithms for Control Flow functions
CO3: Analyze the concept of Strings and Lists
CO4: Illustrate the concept of Tuples and Dictonary
CO5: Interpret the different algorithms for solving a given problem

Text Books :

1   Mark Lutz, , Programming Python, O"Reilly,4th Edition , 2011

2   Mark Lutz, Learning Python , O"Reilly,5th Edition,2013

Reference Books :

1   Alex Martelli ,Python in a Nutshell, O"Reilly.3rd Edition,2017

2   Guido van Rossum and Jr. Fred L. Drake, An Introduction to Python, Network Theory Ltd ,5th Edition,2011

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – I**</u>

18GE028	**MANUFACTURING PRACTICES** (Common to CS, EC, EE & IT)	L	T	P	C
		1	0	4	3

Prerequisite: NIL
Objective:

- *To study the basic concepts of manufacturing processes.*
- *To hands on training of Welding and Foundry processes.*
- *To acquire the knowledge of various manufacturing methods.*

GROUP-A
(CIVIL & MECHANICAL)

1. MANUFACTURING PROCESS :

Theory (Lectures & videos)   **[10]**

1. Foundry
    Mould preparation-Metal casting-plastic moulding.
2. Carpentry
    Carpentry tools-carpentry operations-carpentry joints.
3. Fitting
    Fitting tools-Fitting operations - power tools.
4. Welding
    Types-Arc welding-Gas welding-Brazing.
5. Manufacturing Methods
    Metal forming-Basic Machining-CNC Machining-Metal joining- Additive manufacturing-Glass Cutting.

2. WORKSHOP PRACTICE:

Practical   **[25]**

LIST OF EXPERIMENTS

1. Prepare a mould using solid pattern using foundry process.
2. Make T- joint from the given wooden pieces using carpentry tools.
3. Make Butt joint using arc welding equipment.
4. Perform simple facing and turning operation using Centre Lathe.
5. Make holes as per the given dimensions using drilling machine.

Total [Group-A] = 35 periods

Course Outcomes: *On completion of this course, the students will be able to*
    CO1: Explore the fundamental knowledge of different manufacturing processes.
    CO2: Construct different welding joints and preparation of mould cavity.
    CO3: Examine various machining operations.

Text Books:
 1   Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., Elements of Workshop Technology, Vol. I and Vol. II, Media promoters and publishers private limited, Mumbai, Second Edition, 2017.
 2   Gowri P. Hariharan and A. Suresh Babu, Manufacturing Technology - I Pearson Education, New Delhi, Second Edition, 2013.

Reference Books:
 1   Roy A. Lindberg, Processes and Materials of Manufacture, Prentice Hall India, Delhi, 4th edition, 1998.
 2   Kalpakjian S. And Steven S. Schmid, Manufacturing Engineering and Technology, Pearson Education, Delhi, 7th edition, 2014.
 3   Rao P.N., Manufacturing Technology, Vol. I and Vol. II, Tata McGraw Hill, New Delhi, Third edition, 2013.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018
<u>**SEMESTER – II**</u>

	MANUFACTURING PRACTICES	L	T	P	C
18GE028	**GROUP B(ELECTRICAL & ELECTRONICS)**				
	(Common To CS,EC,EE & IT)	1	0	4	3

Prerequisite: -

Objectives:

- *To study different types of wiring used in house.*
- To learn the procedure for calibration of Single phase Energy meter
- *To learn components in electronics, different logic gates and the working of CRO.*

(i) Theory (Lectures & Videos)   **[02]**

Electrical and Electronics

Electrical symbols

Electrical layout, Electrical wiring materials \ Electronics components

(ii) Practical   **[08]**

List of Experiments:

ELECTRICAL ENGINEERING

1. Fluorescent lamp wiring & Stair-case wiring.

2. Calibration of Single phase Energy meter

ELECTRONICS ENGINEERING

3. Study of Electronic components and Soldering practice.

4. Study of logic gates AND, OR, EX-OR, NOT, Half and Full Adder.

5. Study of CRO

Total (Group B) : 10 Periods

Course Outcomes: On Completion of this course , the student will be able to

CO1: Construct different types of wiring used in house.

CO2: Calibrate single phase Energy meter.

CO3: Organize different electronic components, logic gates and verify its working.

Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

GROUP	Theory Questions (Marks)	Duration (Minutes)	Practical Examinations (Marks)	Duration (Minutes)	Exam will be conducted for (Marks)
Group-A	20	30	50	90	70
Group-B	10	15	20	45	30
Total	30	45	70	135	100

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER – II

18MC052	**ENVIRONMENTAL SCIENCE AND ENGINEERING** (Common to All Branches)	L	T	P	C
		3	0	0	0

Prerequisite: NIL

Objectives:

- *To impart knowledge on the principle of environmental science and engineering.*
- *To embellish the students to understand the usages of natural resources, ecosystem and biodiversity.*
- *To create awareness on pollution, value education and social issues.*
- *To appreciate the importance of environment by assessing its impact on the human world.*
- *To envision the surrounding environment, its functions and its value.*

UNIT – I   INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES   [9]

Environment - definition - scope and importance - need for public awareness; Forest resources - use - over exploitation - deforestation; Water resources - over-utilization of surface and ground water; Mineral resources -environmental effects of extracting and using mineral resources; Food resources - overgrazing - effects of modern agriculture - fertilizer-pesticide problems - water logging - salinity; Role of an individual in conservation of natural resources. **Activity:** Slogan making event on conserving natural resources or plantation of trees.

UNIT – II   ECOSYSTEM AND BIODIVERSITY   [9]

Concept of an ecosystem - structure and function of an ecosystem - producers - consumers and decomposers - Food chain - food web - energy flow in the ecosystem - ecological pyramids - Ecological succession; Forest ecosystem and Aquatic ecosystems (Estuary and marine ecosystem); Biodiversity - introduction - definition - Values of biodiversity; Hot-spots of biodiversity; Endangered and Endemic Species of India. **Activity:** Arrange a trip to visit different varieties of plants.

UNIT – III   ENVIRONMENTAL POLLUTION   [9]

Pollution - introduction and different types of pollution; Causes - effects and control measures of air pollution and water pollution - water quality parameters - hardness - definition - types; Alkalinity - definition - types; BOD and COD (definition and significance); Noise pollution - solid waste management - hazardous waste - medical and e-wastes; Role of an individual in prevention of pollution. **Activity:** Drive for segregation of waste or cleanliness drive.

UNIT – IV   SOCIAL ISSUES AND ENVIRONMENT   [9]

Water conservation - rain water harvesting and watershed management; Environmental ethics - Issues and possible solutions; Climate change - global warming and its effects on flora and fauna - acid rain - ozone layer depletion; Disaster Management - earth quake - cyclone - tsunami - disaster preparedness - response and recovery from disaster. **Activity:** Poster making event on water management or Climate change.

UNIT – V   SUSTAINABILITY AND GREEN CHEMISTRY   [9]

Sustainable development - from unsustainable to sustainable development - Environmental Impact Assessment (EIA); Human rights; Value education; HIV/AIDS; Role of information technology in environment and human health; 12 Principles of Green Chemistry. **Activity:** Group discussion on Sustainability or Lecture from an expert on Green chemistry.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Prioritize the importance in conservation of resources for future generation

CO2: Relate the importance of ecosystem and biodiversity

CO3: Analyze the impact of pollution and hazardous waste in a global and societal context.

CO4: Identify the contemporary issues that result in environmental degradation that would attempt to provide solutions to overcome the problems

CO5: Categorize the concept of Sustainability and Green Chemistry

Text Books :

1   Dr. T. Arun Luiz, Environmental Science and Engineering, S. Chand & Company Private Limited, New Delhi, First Edition, 2016.

2   Anubha Kaushik and C. P. Kaushik, Environmental Science and Engineering, New Age International Publishers, Chennai, 2014

Reference Books :

1   G. Tyler Miller and Scott E. Spoolman, Environmental Science, Cengage Learning India Pvt .Ltd., New Delhi, 2014.

2   Dr. A. Ravikrishnan, Environmental Science and Engineering, Srikrishna Hi-tech Publishing Company Pvt. Ltd., Chennai, 2014.

3   Raman Sivakumar, Introduction to Environmental Science and Engineering, Tata McGraw Hill Education Private Limited, Fourth Edition, 2012.

4   S S. Dara, A Text book of Environmental Chemistry and pollution control, S. Chand & Company Limited, New Delhi, Tenth Edition, 2005.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – II**</u>

18PH028	**PHYSICS LABORATORY** (Common to all branches)	L	T	P	C
		0	0	3	1

Prerequisite: *Knowledge in Engineering Physics*

Objectives:

- *To train engineering students on basis of measurements and the instruments.*
- *To gain the practical knowledge and hands on experiences of understanding the physics concepts applied in optics, sound and thermal physics.*
- *To give practical training on basic Physics experiments which are useful to engineers.*
- *To apply the analytical techniques and graphical analysis to the experimental data.*
- *To develop intellectual communication skills and discuss the basic principles of scientific concepts in a group.*

List of Experiments:
1. Determination of wavelength of Laser using grating and the Size of the Particles.
2. Determination of thickness of the given material by Air - wedge method.
3. Determination of velocity of Ultrasonic waves and compressibility using Ultrasonic interferometer.
4. Spectrometer grating - Determination of wavelength of mercury spectrum.
5. Determination of thermal conductivity of a bad conductor by Lee"s disc method.
6. Determination of Young"s modulus of the material of a uniform bar by Non - Uniform bending method.
7. Determination of Band gap energy of a semiconductor.
8. Determination of Viscosity of a given liquid by Poiseuille"s method.
9. Torsional pendulum - Determination of rigidity modulus of a given wire.
10. V-I Characteristics of Solar Cell.

Total = 30 Periods

Course Outcomes: On Completion of this course , the student will be able to

CO1: Comprehend the different physical parameters of optics.

CO2: Perceive the production of ultrasonic waves through inverse piezoelectric effect and to determine the velocity of sound waves in the given liquid.

CO3: Explore the principles of thermal conductivity thereby to calculate the thermal conductivity of various bad conductors like cardboard, mica, etc.

CO4: Confer the experimental counterparts of materials properties such as modulus, solar cell, and energy gap.

CO5: Imbibe the concept of capillary action in fluid dynamics and to compare the coefficient of viscosity of the given liquid.

Text Book :
1. Faculty Members of Physics, Physics Lab manual, Department of Physics, K.S.R. College of Engineering, Namakkal, seventeenth Edition, 2018.
2. Dr. P. Mani, Physics Lab Manual & Observation Book, Dhanam Publications, tweleth Edition Chennai 2017

Reference Book :
1. Dr. G. Senthilkumar, "Physics Lab manual", VRB Publications Pvt. Ltd., Chennai, tenth Edition, 2006.
2. R Suresh & Dr. C. Kalyanasundaram, Physics Laboratory, Sri Krishna Hitech Publishing Company Pvt. Ltd., Chennai, fifth Edition, 2017.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　**R 2018**

		L	T	P	C
18IT221	**PYTHON PROGRAMMING LABORATORY**	0	0	3	1

Prerequisite: Programming and Problem Solving in C

Objectives:

- *To understand the basic programming constructs*
- *To examine how they are used to develop a program with a desired runtime execution flow*
- *To articulate where computer programs fit in the provision of computer based solutions to real world problems*
- *To understand different sorting problems*
- *To learn to use different data structures*

List of Experiments:

1. Compute the GCD of two numbers.

2. Find the square root of a number (Newton"s method)

3. Write a program for Exponentiation (power of a number)

4. Illustrate the program for finding the maximum of a list of numbers

5. Write a program for Linear search and Binary search

6. Write a program for Selection sort and Insertion sort

7. Write a coding for Merge sort

8. Find the First n prime numbers

9. Write a coding for Multiplication of two matrices

10. Write a program for taking the command line arguments (word count)

11. Find the most frequent words in a text read from a file

12. Simulate elliptical orbits in Pygame

13. Simulate bouncing ball in Pygame

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

　　CO1: Construct the basic programming of python
　　CO2: Analyze the concept of Structured Programming
　　CO3: Identify suitable data structure for solving a problem
　　CO4: Develop the program using different sorting algorithms
　　CO5: Demonstrate about files Pygame
　　　.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

		L	T	P	C
18IT222	**IT ESSENTIAL LABORATORY**	0	0	3	1

Prerequisite: No prerequisites are needed for enrolling into the course

Objectives:

- *To understand the basic of Microsoft Word , Excel and Power Point*
- *To understand various Operating Systems*
- *To study about different Networking Components*
- *To learn to use HTML and CSS*
- *To study various Mobile Technologies*

List of Experiments:

1. Prepare a Bio-data using MS Word with appropriate page, text and table formatting options and send the same too many recipients using mail merge.

2. Prepare a mark sheet with five subjects for five students in MS Excel File using Formulas, Functions and Charts.

3. i) Prepare a Power Point presentation for your organization with varying animation effects using timer.

   ii) Prepare a Student Database in MS Access, manipulate the data and generate report.

4. Install and configure windows operating system.

5. Install and configure Linux operating system.

6. Installation of printer and scanner software.

7. Study of computer networking components.

8. Study of HTML tags and CSS.

9. To create a student"s mark list using HTML

10. To create a simple web page using HTML and CSS.

11. Study of technologies associated with mobile devices.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

   CO1: Interpret about Microsoft Word ,Power Point and Excel
   CO2: Discuss on various Operating Systems
   CO3: Analyze various Mobile Technologies
   CO4: Develop the program using HTML and CSS
   CO5: Analyze about networking concept.

K.S.R. COLLEGE OF ENGINEERING (Autonomous) R 2018

SEMESTER – III

| **18MA343** | **NUMERICAL COMPUTATIONAL TECHNIQUES**
 (Common To CS & IT) | L
 3 | T
 1 | P
 0 | C
 4 |

Prerequisite: No prerequisites are needed for enrolling into the course

Objectives:

- *To study the concepts and applications in solving polynomial and transcendental equations, simultaneous linear equations numerically.*
- *To acquire knowledge in Interpolation techniques.*
- *To study the concepts of numerical differentiation and integration.*
- *To study concepts of numerical solutions for ordinary differential equations*
- *To acquire the concepts of numerical solutions for boundary values problems.*

UNIT – I   SOLUTIONS OF EQUATIONS AND EIGEN VALUE PROBLEMS   [12]

Solutions to polynomial and transcendental equations - Newton Raphson Method - Solutions to simultaneous linear system of equations by Gauss Elimination Method - Gauss Seidel Method - Inverse of a matrix by Gauss Jordan Method–Eigen value of a matrix by power method.

UNIT – II   INTERPOLATION AND APPROXIMATION   [12]

Introduction – Interpolation–Equal Intervals–Newton"s Forward and Backward difference interpolation Techniques–Unequal Intervals - Newton"s divided difference method - Lagrange"s interpolation.

UNIT – III   NUMERICAL DIFFERENTIATIONANDINTEGRATION   [12]

Numerical differentiation using Newton"s Forward and Backward difference interpolation methods (Equal Intervals)-Numerical integration by Trapezoidal rule–Simpson"s 1/3rd and 3/8thrule –Double integration using Trapezoidal and Simpson"s rules.

UNIT – IV   INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS   [12]

Solving ODE by Taylor"s Series Method–Euler"s Method for first order equation – Modified Euler"s Method for first order equation-Fourth order Runge-Kutta method for solving first order equations - Milnes Predictor and Corrector Method.

UNIT – V   BOUNDARY VALUE PROBLEMS IN PARTIAL DIFFERENTIAL EQUATIONS   [12]

Classification of PDE-One dimension heat equation by Crank Nicolson method-One dimensional wave equation-Two Dimensional Laplace and Poisson equations.

Total (L: 45 T:15) = 60 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Solve polynomial, transcendental equations and simultaneous linear equations numerically.
CO2: Predict the unknown values by using Interpolation techniques.
CO3: Develop their skills in numerical differentiation and integration.
CO4: Finding numerical solutions for ordinary differential equations.
CO5: Apply the concepts of numerical solutions to boundary values problems.

Text Books :

1   Dr. B.S. Grewal, Numerical Methods in Engineering and Science, Khanna Publishers, New Delhi, twelth Edition, 2016.

2   Dr. M.K. Venkataraman, Numerical Methods in Science and Engineering, National Publishing Company, Fourth Edition, 2015.

Reference Books:

1   Sukhendudey and Shishir Gupta, Numerical Methods, First Edition, Tata McGraw Hill Publishing Company, 2016.

2   Gerald.V, Applied Numerical Analysis Pearson Education, Sixth edition, 2015.

3   Kandasamy.P, Thilagavathy and Gunavathy.K., Numerical Methods, S. Chand Publishers,Fifth edition,2016.

4   https://www.youtube.com/watch?v=AT7Olelic8U &https://www.youtube.com/watch?v=QTQ8bO1F-Dg

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - III

18EC332	**DIGITAL PRINCIPLES AND SYSTEM DESIGN**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Prerequisite: No prerequisites needed for enrolling into the course.

Objectives:

- *To learn the concept of number system and basic postulates of Boolean algebra.*
- *To understand the procedure for analysis and design of combinational circuits.*
- *To study the concepts of latches, flip-flops and counters.*
- *To familiarize a design procedure for sequential circuits.*
- *To be exposed to design using PLD and concepts of memory.*

UNIT – I   BOOLEAN ALGEBRA AND LOGIC GATES   [9]

Review of Number systems - Arithmetic operations - Binary codes - Boolean Algebra and Theorems - Boolean functions - Simplification of Boolean functions using Karnaugh Map and Tabulation methods - Logic gates - Implementation of logic functions using basic gates, NAND-NOR implementations.

UNIT – II   COMBINATIONAL LOGIC   [9]

Combinational circuit - Analysis and design procedure - Circuits for arithmetic operation : Half adder, full adder, Half subtractor, full subtractor , parallel adder, carry look ahead adder & binary adder - 2 bit Magnitude comparator, Code converters - Decoders and Encoders - Multiplexers and Demultiplexers - Introduction to HDL - HDL models of Combinational circuits.

UNIT – III   SYNCHRONOUS SEQUENTIAL LOGIC   [9]

Latches and Flip Flops - Analysis and design procedure - State reduction and State assignment - Shift registers - Counters - HDL for sequential logic circuits.

UNIT – IV   ASYNCHRONOUS SEQUENTIAL LOGIC   [9]

Analysis and design of asynchronous sequential circuits - Reduction of state and flow table - Race-free state assignment - Hazards.

UNIT – V   MEMORY AND PROGRAMMABLE LOGIC   [9]

Classification of memories-RAM and ROM organization - Memory decoding - Programmable Logic Array - Programmable Array Logic - Field Programmable Gate Arrays (FPGA) - Application Specific Integrated Circuits.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Analyze different methods used for simplification of Boolean expressions.

CO2: Design and implement Combinational circuits and develop their HDL models

CO3: Describe memory devices like ROM, RAM, PROM, PLD and ASIC.

CO4: Formulate a procedure for analysis and design of synchronous sequential circuits and develop their HDL models.

CO5: Analyze and design asynchronous sequential digital circuits.

Text Books :

1   M. Morris Mano, Digital Design, Prentice Hall of India, New Delhi, Fourth Edition, Fifth Impression, 2012.

2   Thomas L.Floyd, Digital Fundamentals, PHI, New Delhi, Eighth Edition, 2003.

Reference Books :

1   John F. Wakerly, Digital Design Principles and Practices, Pearson Education, US, Ninth Impression, 2013.

2   Charles H.Roth, Fundamentals of Logic Design, Thomson Learning, US, Fifth Edition, 2011.

3   Donald D. Givone, Digital Principles and Design, Tata McGraw Hill, Twenty First Reprints, 2012.

4   Donald P.Leach, Albert Paul Malvino and Goutam Saha, Digital Principles and Applications, McGraw Hill Education, USA, Eighth Edition, 2015.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - III

		L	T	P	C
18IT311	**OBJECT ORIENTED PROGRAMMING**	3	0	0	3

Prerequisite: Programming for Problem solving Using C

Objectives:

- *To learn the basic concept of Object Oriented Programming*
- *To develop programming skills on Overloading*
- *To get introduced on handling Strings and functions*
- *To learn advanced file handling and stream operations*
- *To learn the concept on Templates*

UNIT – I   INTRODUCTION TO OBJECT ORIENTED PROGRAMMING   [9]

Introduction - Procedure Vs -- Object Oriented Programming - Characteristics of OOPs - Programming Basics - Control Structures – Structures – Functions

UNIT – II   BASICS OF OOP   [9]

Objects and Classes - Constructors and Destructor - Constructor Overloading - Operator Overloading - Access Specifies:: Private - Public - Protected - Static data member and functions and classes - Arrays

UNIT – III   STRINGS & FUNCTIONS   [9]

Strings - Abstract class - Function Overloading - Inline functions - Friend Functions and Classes - Virtual Functions - Inheritance

UNIT – IV   STREAMS & FILES   [9]

Pointers - Dynamic allocation: new/delete - Linked lists - Streams and Files: Streams classes - Stream Errors - Disk File I/O with streams - File pointers - Error handling in file I/O with member function - Overloading the extraction and insertion operators - Memory as a stream object - Command line arguments - And printer output - Multi-file Programs

UNIT – V   TEMPLATES   [9]

Templates : Function template - Class templates - Exceptions - Standard Template Library: Introduction algorithms - Sequence containers - Iterators - Specialized Iterators - Associative containers - Strong user-Defined object - Function objects

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

> *CO1: Discuss about procedure-oriented program and object-oriented program*
> *CO2: Explain OO programs using overloading*
> *CO3: Apply the concept of Strings and Functions in Object Oriented Programming*
> *CO4: Demonstrate about Streams and Files*
> *CO5: Build the program using Templates*

Text Book :

1   Robert Lafore, Object Oriented Programming in C++, Galgotia, Fourth Edition, 2014

Reference Books :

1   Paul Deitel ,C++ How to Program, Pearson Education, Seventh Edition, 2010
2   E Balagurusamy, Object Oriented Programming with C++, McGrawHill, Sixth Edition, 2013

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**
<u>**SEMESTER – III**</u>

18IT312	OPERATING SYSTEMS (Common to IT & ME)	L	T	P	C
		3	0	0	3

Prerequisite: Basic Knowledge in Computer Fundamentals
Objectives:
- *To study the basic concepts and functions of operating systems*
- *To learn about Processes, Threads, Scheduling algorithms and deadlocks*
- *To analyze various memory management techniques*
- *To know the concept of I/O and file management*
- *To Learn the basics of Linux system and perform administrative tasks on Linux Servers and aware of latest Operating Systems used in industry*

UNIT – I   INTRODUCTION   [9]
Basics of Operating Systems: Definition - Generations of Operating Systems - Types of Operating Systems: Mainframe Desktop - Multiprocessor - Distributed - Clustered - Multiprogramming - Real Time - Embedded and Time sharing -- Operating System Components - Operating System Services - System Calls - System Call Execution

UNIT – II   PROCESS MANAGEMENT   [9]
Process: Process Concept - Process Control Block - Context Switches - Threads - Necessity and Advantage of Threads - Types of Threads - System Calls - Examples - Process Scheduling: Scheduling Objectives - Types of Schedulers - Scheduling Criteria - Scheduling Algorithms - Inter process Communication and Synchronization: Shared Memory System - Message Passing - Critical Section - Mutual Exclusion - Semaphores. Deadlocks: Deadlock Characteristics - Deadlock Prevention – Deadlock Avoidance – Deadlock Detection and Recovery

UNIT – III   MEMORY MANAGEMENT   [9]
Swapping - Memory Allocation - Contiguous Memory Allocation - Paging - Segmentation - Segmentation with Paging-- Virtual Memory - Demand Paging - Page Replacement Policies - Optimal (OPT) - First in First Out (FIFO) - Not Recently Used (NRU) and Least Recently Used (LRU)

UNIT – IV   FILE AND I/O MANAGEMENT   [9]
File Concepts - Access methods - Directory Structure - File sharing - Protection - Access Rights - File System Structure - Byte Sequence - Record Sequence and Treebased - Recovery - Disk formatting - I/O Management: I/O Buffering - Single and Double Buffer Schemes - Disk Organization - Secondary Storage Management: File Allocation Methods - Contiguous Allocation - Non-contiguous Allocation - Chained -- Indexed Allocation - Free Space Management - Disk Scheduling - FCFS - SSTF - SCAN and C- SCAN - Disk Cache

UNIT – V   Advanced OS and CASE STUDY   [9]
Microsoft Windows - Apple macOS - Android and Apple's iOS - Linux System: Basic Concepts - System Administration- Requirements for Linux System Administrator - Setting up a LINUX Multifunction Server - Domain Name System - Setting Up Local Network Services - Virtualization - Basic Concepts - Setting Up Xen - VMware on Linux Host and Adding Guest OS

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
   CO1: Discuss the basic concept of Operating System
   CO2: Analyze Process Management Deadlock Prevention and Avoidance algorithms
   CO3: Compare and contrast various memory management schemes
   CO4: Apply the principles of File and I/O Management
   CO5: Discuss on advanced OS

Text Books :
1   Abraham Silberschatz, Operating System Concepts, John Wiley & Sons, 9th Edition, 2012
2   William Stallings, Operating Systems - Internals and Design Principles, 7th Edition, Prentice Hall, 2011

Reference Books :
1   Harvey M. Deitel, Paul Deitel, David R.Choffnes, Operating Systems, Prentice Hall, 3rd Edition, 2004
2   Andrew S. Tanenbaum , Operating Systems - Design and Implementation, Pearson Education, 2015
3   D.M. Dhamdhere, Operating Systems - A Concept Based Approach, TMGH, 2007
4   Richard Peterson, Linux: The Complete Reference, Tata McGraw Hill, 6th Edition, 2007

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　**R 2018**

SEMESTER - III

18IT313	DATA STRUCTURES	L	T	P	C
		3	0	0	3

Prerequisite: Programming for Problem solving Using C

Objectives:
- *To learn the basic concepts of ADTs*
- *To learn linear data structures stacks and queues.*
- *To analyze the concept of non linear data structures*
- *To gain knowledge on sorting and searching algorithms*
- *To apply Graph structures*

UNIT – I　　LINEAR DATA STRUCTURES – LIST　　　　　　　　　[9]

Abstract Data Types (ADTs) - List ADT - Array-based implementation - Linked list implementation - Singly linked lists - Circularly linked lists - Doubly - Linked lists - Applications of lists

UNIT – II　　LINEAR DATA STRUCTURES – STACK AND QUEUES　　　　[9]

Stack ADT - Operations - Applications - Evaluating arithmetic expressions -- Conversion of Infix to postfix expression - Queue ADT - Operations - Circular Queue - Priority Queue - De Queue - Applications of queues

UNIT – III　　NON-LINEAR DATA STRUCTURES – Trees　　　　　　[9]

Tree ADT - Tree traversals - Binary Tree ADT - Expression trees - Applications of trees - Binary search tree ADT -Threaded Binary Trees - AVL Trees - B-Tree - B+ Tree - Heap - Applications of heap

UNIT – IV　　SEARCHING AND SORTING　　　　　　　　　　[9]

Searching - Linear Search - Binary Search - Sorting - Bubble sort - Selection sort - Insertion sort - Shell sort - Radix sort Hashing - Hash Functions - Separate Chaining - Open Addressing - Rehashing - Extendible Hashing

UNIT – V　　GRAPHS　　　　　　　　　　　　　　　[9]

Basic Concepts of Graphs - Operations - Depth-First Traversal - Breath -- First Traversal - Minimum Spanning Trees - Kruskal and Prim Algorithm - Shortest Path Algorithm - Dijkstra"s Algorithm - Bellman and Ford Algorithm

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
　　CO1: Apply various linear data structures in real time applications and projects
　　CO2: Solve the real world problems using stack and queue techniques
　　CO3: Implement and solve problems using non linear data structures
　　CO4: Design algorithms to solve common sorting and searching problems
　　CO5: Identify the algorithms that are used to solve various problems using graph

Text Books :

1　M.A.Weiss, Data Structures and Algorithm Analysis in C , Second Edition, Pearson Education, 2015

2　Reema Thareja, Data Structures Using C, Second Edition , Oxford University Press, 2011

Reference Books :

1　Richard F.Gilberg & Behrouz A. Forouzan, Data Structures A Pseudocode Approach with C, Second Edition, Cengage Learning India Pvt. Ltd, 2005

2　Seymour Lipschutz, Data Structures with C (Schaum"s Outline Series), McGraw Hill, 2011

3　Kruse R.L. Tondo C.L and Leung B.P, Data Structure and program Design in C, Second Edition, Pearson Education India, 2007

4　A.V. Aho, J.E. Hopcraft, and J.D Ullman, Data structures and algorithms, Pearson Education, Reprint 2001

5　http://www.nptelvideos.in/2012/11/data-structures-and-algorithms.html

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

<u>**SEMESTER – III**</u>

18MC051	**CONSTITUTION OF INDIA** (Common to All Branches)	L	T	P	C
		3	0	0	0

Prerequisite:Nil

Objectives:

- *To promote harmony throughout the nation.*
- *To enables the supreme law and helps to maintain integrity in the society and to promote unity among the citizens to build a great nation.*
- *To learn about the fundamentals of our Indian constitution and their structure.*
- *To understand the formation of state government, union government, Indian Judiciary System and Election Commission.*
- *To provides a way of life. It includes fraternity, liberty, and equality as the notion of a happy life and which cannot be taken from each other.*

UNIT - I   INTRODUCTION   [9]

Historical Background - Significance of the Constitution - Making of the constitution - Constituent Assembly of India - Role of the constituent Assembly - Salient features of the constitution - Nature of Federal system.

UNIT - II   FUNDAMENTAL RIGHTS AND DUTIES   [9]

Preamble - Citizenship - Fundamental Rights - Fundamental Duties and Responsibilities - Directive Principles of State Policy – Procedure for Amendment.

UNIT - III   UNION GOVERNMENT   [9]

Union Government - President - Vice President - Prime Minister - Powers and Duties - Cabinet - Council of Ministers - Parliament - Functions - Lok Sabha - Rajya Sabha - Role of the Speaker.

UNIT - IV   STATE GOVERNMENT   [9]

State Government - The Governor - Council of Ministers and Chief Minister - Powers and Functions - State legislature - Local Governance.

UNIT - V   JUDICIAL SYSTEM AND ELECTION COMMISION   [9]

The Indian Judicial System - Supreme Court - High Courts of India - Judicial Review - Election Commission of India - Duties and Responsibilities - State Election Commissions - Roles and functions.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

- *Categorize the emergence and evolution of Indian Constitution.*
- *Comprehend the fundamental rights and duties of the Indian citizen.*
- *Recognize and evaluate the Indian Political scenario amidst the emerging challenges.*
- *Analyze the organs of the state in the contemporary scenario.*
- *Asses about the Indian judiciary system and working of Election Commission*

Text Book :

1   P.M. Bakshi,The Constitution of India , Universal law Publishing, New Delhi, fifteenth Edition, 2018.

2   D.D.Basu, Introduction to the constitution india,Lexis nexis Publisher, New Delhi,second Edition, 2015.

Reference Books :

1   Brij Kishore sharma,Introduction to the constitution india,PHI Learning Pvt. Ltd, New Delhi, seventh Edition, 2015.

2   Sharma B. K, Introduction to the Constitution of India, PHI Learning Pvt. Ltd, New Delhi, sixth Edition, 2011.

3   M. Laxmikanth, Indian Polity, Tata McGraw Hill, New Delhi,sixth Edition, 2017.

4   Prof. Mahendra Pal Singh, Constitution of India, Eastern Book company, Lucknow, thirteenth Edition, 2015.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - III

			L	**T**	**P**	**C**
18IT321	**OBJECT ORIENTED PROGRAMMING LABORATORY**		**0**	**0**	**3**	**1**

Prerequisite: *Programming for Problem Solving using C*

Objectives:
- *To develop object oriented programming skills using C++*
- *To make the students to solve the problems using function and overloading concept.*
- *To learn and write the programs using Inheritance*
- *To gain Knowledge on Templates*
- *To develop the programs based on Exception Handling mechanism*

List of Experiments:

Implementation of the following concepts:

1. Class and Objects.

2. Friend Functions and Function Overloading.

3. Constructors and Destructors.

4. Inheritance.

5. Polymorphism.

6. Operator Overloading.

7. Templates.

8. Exception Handling.

9. Data types, Arrays and Operators.

10. Packages.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
  CO1: Create a program using Class and Object
  CO2: Develop OO programs using overloading
  CO3: Build programs using Templates
  CO4: Make use of exceptions for writing OO programs
  CO5: Develop the programs using packages

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - III**</u>

		L	T	P	C
18IT322	**OPERATING SYSTEMS LABORATORY**	0	0	3	1

Prerequisite: *Basic knowledge in Linux environment and also Knowledge in Programming for Problem Solving using C*

Objectives:

- *To learn shell programming and the use of filters in the LINUX environment*
- *To be exposed to programming in C using system calls*
- *To learn to use the file system related system calls*
- *To be exposed to process creation and inter process communication*
- *To be familiar with implementation of CPU Scheduling Algorithms, page replacement algorithms and Deadlock avoidance*

List of Experiments:

1. Write programs using the following system calls of *LINUX* operating system like fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write programs using the I/O system calls of *LINUX* operating system (open, read, write etc.)
3. Write C programs to simulate *LINUX* commands like ls, grep etc.
4. Recall Shell programming with some simple examples
5. Implement the following CPU scheduling algorithms
       a) Round Robin   b) SJF   c) FCFS   d) Priority
6. Implementation of File Allocation Strategies (like Sequential, Indexed, Linked)
7. Implementation of Producer and Consumer problem using Semaphores
8. Implementation of Files Organization Techniques (like Single level directory, Two levels hierarchical DAG)
9. Implementation of Banker"s algorithm for Dead Locks Avoidance
10. Implementation of Dead Lock Detection methods
11. Implementation of Page Replacement Algorithms (like FIFO, LRU and LFU)
12. Implementation of Shared Memory and IPC
13. Implementation of Paging Technique in Memory Management
14. Implementation of Threading and Synchronization Applications

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

   CO1: Make use of LINUX utilities, LINUX file system, file access control and perform basic shell operations
   CO2: Develop the program for process scheduling & synchronization algorithms, deadlock avoidance and detection Algorithms
   CO3: Compare the performance of various CPU Scheduling Algorithm
   CO4: Analyze the performance of the various page replacement algorithms
   CO5: Create processes and implement IPC

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - III**</u>

		L	T	P	C
18IT323	**DATA STRUCTURES LABORATORY**	0	0	3	1

Prerequisite: *Programming for Problem solving Using C and also basic Knowledge on Data Structures*

Objectives:
- *To develop programming skills in design and implementation of linear data structures*
- *To strength the ability to identify and apply to the suitable data structure for the given real world problem on linear data structures*
- *To gain the practical knowledge in trees and heaps*
- *To practice the hashing techniques*
- *To make the students to solve the different tree traversal algorithms*

List of Experiments:

1. Array implementation of List, Stack and Queue ADTs

2. Linked List implementation of List, Stack and Queue ADTs

3. Evaluation of Expression

4. Implementation of Array based Circular Queue

5. Creation of Binary Trees and Implementation of its operation

6. Implementation of Binary Tree and produce its pre-order, in-order, post-order Traversals

7. Implementation of Binary Search Trees

8. Implementation of Priority Queues using Heaps

9. Implementation of Searching and Sorting Algorithms

10. Implementation of Hashing Techniques

11. Implementation of Dijkstra"s Algorithm

12. Implementation of minimum spanning tree using Kruskal"s Algorithm

13. Implementation of minimum spanning tree using Prim"s Algorithm

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
   CO1: Build the elementary data structures such as list, stack, queue, linked list and tree

   CO2: Identify the appropriate data structure for a given problem

   CO3: Develop the recursive programs using trees, Heaps and graphs in C

   CO4: Explain non-linear data structures for various real time applications in C

   CO5: Develop the programs for minimum spanning tree using different types of algorithms

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - III

		L	T	P	C
18HR351	**CAREER DEVELOPMENT SKILLS I** (Common to all Branches)	0	2	0	0

Prerequisite: No prerequisites are needed for enrolling into the course

Objectives:

- *To help individuals cope with continued changes in the world of work*
- *To help individuals understand their unique abilities, interests, and aptitudes*
- *Ability to speak, express and interact in the society and place of study*
- *Critically interpret and comprehend a given text*
- *Ability to make extempore speech*

UNIT – I   EFFECTIVE ENGLISH – SPOKEN ENGLISH   **[6]**

Basic Rules of Grammar - Parts of Speech - Tenses - Verbs - Sentences construction - Vocabulary - idioms & phrases - Synonyms - Antonyms - Dialogues and conversation - Exercise(Speaking)

UNIT – II   ESSENTIAL COMMUNICATION   **[6]**

Verbal communication - Effective communication - Active Listening - Paraphrasing - Feedback - Non Verbal Communication - Body language of self and Others - Important of feelings in communication - Dealing with feelings in communication practice – Exercise

UNIT – III   WRITTEN COMMUNICATION – PART 1   **[6]**

Usage of noun - pronoun - adjective (Comparative Forms) - Verb - Adjectives - Adverb - Tenses - Articles and Preposition - Change of Voice - Change of Speech - One word Substitution - Using the same word as different parts of speech – Odd Man Out – Spelling & Punctuation (Editing)

UNIT – IV   WRITTEN COMMUNICATION – PART – 2   **[6]**

Analogies - Sentences Formation - Sentence Completion - Sentence Correction - idioms & Phrases - Jumbled Sentences, Letter Drafting (Formal Letters) - Reading Comprehension (Level 1) - Contextual Usage - Foreign Languages Words used in English – Exercise

UNIT – V   ORAL COMMUNICATION – PART – 1   **[6]**

Self-introduction – Situational Dialogues / Role Play (Telephonic Skills) – Oral Presentations – Prepared –„Just A Minute‟ Sessions (JAM) – Presentation Skills – Exercise

Total = 30 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Have competent knowledge on grammar with an understanding of its basic rules
CO2: Communicate effectively and enhance interpersonal skills with renewed self – confidence
CO3: Construct sentence in English and make correction
CO4: Perform oral communication in any formal situation
CO5: Develop their LSRW skills

Text Books:
1   Anne Laws, Writing Skills, Orient Black Swan. Hyderabad, First Edition, 2011.
2   Sarah Freeman, Written Communication in English, Orient Black Swan, Hyderabad, First Edition, 2015

Reference Books :
1   M Ashra Rizvi, Effective Technical Communication, Tata McGraw HILL, New Delhi, First Edition, 2005.
2   Raj N Bakshmi, English Grammar Practice, Orient Black Swan, Hyderabad, First Edition, 2009.
3   Norman Lewis. W.R., "Word Power Made Easy", Goyal Publications
4   Thakur K B Sinha, Enrich Your English, Vijay Nicole, Chennai, First Edition, 2005.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　**R 2018**

SEMESTER – IV

		L	T	P	C
18MA441	**PROBABILITY AND DECISION MODELS** (Common To CS & IT)	3	1	0	4

Prerequisite: No prerequisites are needed for enrolling into the course.

Objectives:
- *To provide the required mathematical support in real life problems and to develop probabilistic models which can be used in several areas of science and engineering*
- *To acquire skills in handling situations involving two dimensional random variables*
- *To gain the fundamental knowledge in the random processes*
- *To study the concepts of queuing models*
- *To acquire knowledge in PERT and CPM*

UNIT – I   ONE DIMENSIONAL RANDOM VARIABLE   [12]

Discrete and Continuous Random Variable - Moments - Moment Generating Functions and their Properties- Standard Distributions: Binomial, Poisson, Exponential and Normal Distributions

UNIT – II   TWO DIMENSIONAL RANDOM VARIABLES   [12]

Joint Distributions - Marginal and Conditional Distributions - Covariance - Correlation and Regression analysis and their Properties

UNIT – III   RANDOM PROCESSES   [12]

Classification - Stationary Process - Markov Process - Markov Chain - Transition Probabilities - Limiting Distributions - Poisson Process and their Properties

UNIT – IV   QUEUEING MODELS   [12]

Markovian Queues - Little"s formula - Single Server Models : (M/M/1):(∞/FIFO) and (M/M/1):(N/FIFO) - Multi Server Models : (M/M/C):(∞/FIFO) and (M/M/C):(N/FIFO)

UNIT – V   NETWORK MODELSMENT   [12]

Network Construction - Critical Path Method (CPM) - Computations of total, free and independent floats - PERT Analysis - Computation of expected time and standard deviation

Total (L: 45 T:15) = 60 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Explain the importance of one dimensional random variables discrete and continuous distribution
CO2: Develop their skills in joint, marginal, conditional distributions and the concept of covariance
*   correlation & regression*
CO3: Analyze the theory of stationary process, Markov Process and transition probabilities, and Poisson Process
CO4: Illustrate the basic concept of single server and multi-server queuing models
CO5: Realize the concept of PERT and CPM

Text Books :

1　Kandasamy.P,Thilagavathi.K and Gunavathi.K, Probability and Queueing Theory, S. Chand Publishers, Third Edition Reprint, 2016.

2　Hamdy. A.Taha, Operations Research, Pearson Education, Tenth Edition, 2015.

Reference Books :

1　Oliver C. Ibe, Fundamentals of Applied Probability and Random Processes, Elsevier,Third Indian Reprint, 2016.
2　Moorthy M.B.K, Subramani.K and Santha.A,Probability and Queueing Theory, Scitech Publishers, FifthEdition, 2015.
3　Veerarajan.T., Probability, Statistics and Random Processes, Tata McGraw-Hill Publications, New Delhi, tenth Edition, 2015.
4　https://www.youtube.com/watch?v=J70dP_AECzQ

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - IV

18IT411	**COMPUTER ORGANIZATION** **(Common to IT & ME)**	**L** 3	**T** 0	**P** 0	**C** 3

Prerequisite: Learn the Basic Structure and Operation of Computer

Objectives:
- *To interpret the basics structure of computers, operations and instructions*
- *To learn the arithmetic and logic unit and implementation of fixed-point and floating point arithmetic unit*
- *To demonstrate the basics of pipelined execution*
- *To inspect the various memory systems and I/O communication*
- *To analyses parallelism and multi core processors*

UNIT – I   **BASIC STRUCTURE OF COMPUTERS**   **[9]**

Functional units - Basic operational concepts - Bus structures - Instructions and instruction sequencing - Hardware - Software Interface - Translation from a high level language to the hardware language - Instruction set architecture - Styles and features - Addressing modes - RISC - CISC - Amdahl"s law - Performance and metrics

UNIT – II   **ARITHMETIC FOR COMPUTERS**   **[9]**

Addition and Subtraction - Fast Adders - Multiplication - Division - Floating Point Representation - Floating Point Operations – Sub word Parallelism

UNIT – III   **PIPELINING**   **[9]**

Basic concepts - Data hazards - Instruction hazards - Influence on instruction sets - Data path and control considerations – Performance considerations

UNIT – IV   **MEMORY & I/O SYSTEM**   **[9]**

Memory Hierarchy - Memory Technologies - Cache Memory - Measuring and Improving Cache Performance - Virtual Memory - TLB„s - Accessing I/O Devices - Interrupts - Direct Memory Access - Bus structure - Bus operation - Arbitration – Interface circuits - USB

UNIT – V   **MULTICORE ARCHITECTURE**   **[9]**

Current Trends - Multi core Processors and other Shared Memory Multiprocessors - Graphics and Computing - Introduction to Graphics Processing Units - Clusters - Warehouse Scale Computers and other Message - Passing Multiprocessors GPUs Case Study: Pentium Processor

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
> *CO1: Demonstrate the operational concepts of computers and classify instruction set architectures*
>
> *CO2: Apply the various arithmetic operations and discuss the design of ALU*
>
> *CO3: Evaluate the performance of a pipelined processor*
>
> *CO4: Design the memory and I/O system requirements for any commercial processor*
>
> *CO5: Discuss the concepts of parallelism and multi core processors*

Text Books :

1 Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Computer Organization, Fifth Edition, Tata McGraw Hill, 2011

2 Ramesh Gaonkar, Microprocessor Architecture- Programming and Applications with the 8085, Fifth Edition, Penram International Publishing (India) Pvt. Ltd, 2011

Reference Books :

1 David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software interface", Fifth Edition, Elsevier, 2013

2 William Stallings, Computer Organization and Architecture - Designing for Performance, Ninth Edition, Pearson Education, 2012

3 M.Morris Mano, Computer System Architecture, Third Edition, Pearson Education, 2007

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - IV**</u>

18IT412	**DATABASE MANAGEMENT SYSTEMS** **(Common to IT & ME)**	**L** 3	**T** 0	**P** 0	**C** 3

Prerequisite: No prerequisite needed for enrolling into the course

Objectives:
- *To learn the fundamentals of data models*
- *To be familiar with managing relational database systems*
- *To learn the concept on data storage and query processing*
- *To gain the knowledge on transaction management*
- *To analyze on current trends and recent database*

UNIT – I   **FUNDAMENTALS OF DATABASES**   **[9]**

Purpose of Database System - Views of Data - Data Models - Database Languages - Database System Architecture - Database Users and Administrator - Entity - Relationship Model (E-R model) - Introduction to Relational Databases - Structure of Relational Model – Types – Keys

UNIT – II   **RELATIONAL MODEL**   **[9]**

Relational Algebra - SQL - Data Definition - Queries in SQL - Updates - Views - Integrity and Security - Sub Queries - Correlated Sub Queries - Relational Database design - Functional Dependencies and Normalization for Relational Databases (up to BCNF)

UNIT – III   **DATA STORAGE AND QUERY PROCESSING**   **[9]**

Overview of Physical Storage Media - Magnetic Disks - RAID - Tertiary Storage - File Organization - Organization of Records in Files - Indexing and Hashing - Ordered Indices - B+ tree Index Files - B tree Index Files - Static Hashing - Dynamic Hashing - Query Processing Overview - Selection Operation - Sorting - Join Operation - Database Tuning

UNIT – IV   **TRANSACTION MANAGEMENT**   **[9]**

Transaction Concepts - Transaction Recovery - ACID Properties - Need for Concurrency Control - Schedule and Recoverability - Serializability and Schedules - Concurrency Control - Types of Locks - Two Phases locking - Deadlock - Time Stamp Based Concurrency Control - Recovery Techniques - Concepts - Immediate Update - Deferred Update - Shadow Paging

UNIT – V   **CURRENT TRENDS**   **[9]**

Distributed Databases: Architecture - Data Storage - Transaction Processing - Object-based Databases: Object Database Concepts - Object-Relational features - ODMG Object Model - ODL - Mobile database - Spatial database - XML Databases: XML Hierarchical Model - DTD - XML Schema - Information Retrieval: IR Concepts - Retrieval Models - Queries in IR systems

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
- *CO1: Comprehend the fundamentals of data models*
- *CO2: Design SQL and relational database*
- *CO3: Analyze the internal storage structures using different file and indexing techniques*
- *CO4: Describe the fundamental concepts of transaction Management Techniques*
- *CO5: Discuss on new developments and trends in databases*

Text Books :

1   Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Database System Concepts ,Sixth Edition, Tata McGraw Hill 2012

2   C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, Eighth Edition, Pearson Education,2012

Reference Books :

1   Ramez Elmasri and Shamkant B. Navathe, Fundamental Database Systems, Pearson Education, Fifth Edition 2014

2   Raghu Ramakrishnan, Database Management System, Tata McGraw-Hill Publishing Company, 2013

3   S.K.Singh, Database Systems Concepts- Design and Applications, First Edition, Pearson Education, 2013

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – IV</u>

		L	T	P	C
18IT413	**COMPUTER NETWORKS**	**3**	**0**	**0**	**3**

Prerequisite: Principles of Communication

Objectives:
- *To learn the functionalities of each layer*
- *To be familiar with the Data Link layer*
- *To gain the knowledge on network protocols. Architectures and applications*
- *To examine the functionalities on TCP and UDP*
- *To interpret the knowledge on application layer*

UNIT – I   INTRODUCTION   [9]

Data Communications - Data Flow - Networks - The Internet - Protocols and Standards - Network Models: Layered Tasks - The OSI Model - TCP/IP Protocol Suite - Addressing - Transmission Media - Connecting LANs - Backbone Networks - and Virtual LANs: Connecting Devices

UNIT – II   DATA LINK LAYER   [9]

Introduction - Block Coding - Cyclic Codes - Checksum - Data Link Control: Framing - Flow and Error Control - Noiseless Channels - Noisy Channels - HDLC - Multiple Access: Random Access - Channelization - Wired LANs: IEEE Standards - Standard Ethernet – Wireless LANs: IEEE 802.11

UNIT – III   NETWORK LAYER   [9]

IPv4 Addresses - IPv6 Addresses - Internetworking - IPv4 - IPv6 - Transition from IPv4 to IPv6 - Network Layer: Delivery-Forwarding and Routing - Address Mapping - Internet Control Message Protocol (ICMP) - Internet Group Management Protocol (IGMP) - Unicast Routing Protocol - Multicast Routing Protocols

UNIT – IV   TRANSPORT LAYER   [9]

Process-to-Process Delivery - User Datagram Protocol (UDP) - Transmission Control Protocol (TCP) - Stream Control Transmission Protocol (SCTP) - Congestion Control and Quality of Service: Data Traffic - Congestion Control - Quality of Services (QoS) - Techniques to Improve QoS - Integrated Services - Differentiated Services

UNIT – V   APPLICATION LAYER   [9]

Domain Name System (DNS): Domain Name Space - Distribution of Name Space - DNS in the Internet - WWW and HTTP – Network Management: Simple Network Management Protocol (SNMP)

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Identify the components required to build different types of networks
CO2: Explain error and flow control mechanisms
CO3: Choose the required functionality at each layer for given application
CO4: Identify solution for each functionality of transport layer protocols
CO5: Discuss about different protocols used in application layer

Text Books :

1   Behrouz A.Forouzan, Data Communication and Networking, Fourth Edition, Tata McGraw Hill, 2011
2   Larry L. Peterson, Bruce S. Davie, Computer Networks: A systems approach, Fifth Edition, Morgan Kaufmann Publishers, 2012

Reference Books :

1   James F. Kurose Keith W. Ross, Computer Networking - A Top-Down Approach Featuring the Internet, Fifth Edition, Pearson Education, 2012
2   Andrew S.Tanenbaum, Computer Networks 4th Edition ,Pearson Education ,2016
3   William Stallings, Data and Computer Communication, Tenth Edition, Pearson Education, 2013
4   Ying Dar Lin Ren, Hung Hwang Fred Baker, Computer Networks: An Open Source Approach, Mc Graw Hill Publisher, 2011

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - IV

18IT414	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	C
		3	0	0	3

Prerequisite: *Data Structures*

Objectives:

- *To learn the algorithm analysis techniques*
- *To become familiar with the different algorithm design techniques*
- *To analyze the efficiency of sorting and searching algorithm*
- *To be familiar with analysis of graph algorithms*
- *To gain knowledge on NP-completeness problems*

UNIT – I   BASIC CONCEPTS OF ALGORITHMS   [9]

Introduction - Notion of Algorithm - Fundamentals of Algorithmic Solving - Important Problem Types - Fundamentals of the Analysis of Algorithm Efficiency - Analysis Framework - Asymptotic Notations and Basic Efficiency Classes

UNIT – II   MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS   [9]

Mathematical Analysis of Non-recursive Algorithm - Mathematical Analysis of Recursive Algorithm - Example: Fibonacci Numbers

UNIT – III   ANALYSIS OF SORTING AND SEARCHING ALGORITHMS   [9]

Brute Force Strategy: Selection Sort and Bubble Sort - Sequential Search and Brute-force String Matching - Divide and Conquer: Merge sort - Quick Sort - Binary Search - Binary tree Traversal - Decrease and Conquer: Insertion Sort - Depth First Search and Breadth First Search

UNIT – IV   ANALYSIS OF GRAPH ALGORITHMS   [9]

Transform and Conquer: Presorting - Balanced Search trees - AVL Trees - Heaps and Heap Sort - Dynamic Programming: Warshall„s and Floyd„s Algorithm - Optimal Binary Search Trees - Greedy Technique: Prim„s Algorithm - Kruskal„s Algorithm – Dijkstra„s Algorithm – Huffman Trees

UNIT – V   ALGORITHM DESIGN TECHNIQUES TO NP COMPLETE PROBLEMS   [9]

Limitations of Algorithm Power: NP Complete Problems - Backtracking: n-Queen„s Problem - Hamiltonian Circuit Problem - Subset-Sum Problem - Branch and Bound: Assignment Problem- Knapsack Problem - Traveling Salesman Problem

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*

     CO1: Analyze the various Data Structures algorithms
     CO2: Apply different data structures to problem solutions
     CO3: Analyze the time and space complexity of algorithms
     CO4: Modify existing algorithms to improve efficiency
     CO5: Compare the different algorithm design techniques for a given problem

Text Books :

1   Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012

2   M. A. Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education, 2015

Reference Books :

1   Sara Baase and Allen Van Gelder, "Computer Algorithms- Introduction to Design and Analysis", Second Impression, Pearson Education India, 2012

2   Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms", Pearson Education, Reprint 2014

3   Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Second Edition, Mc Graw Hill, 2012

4   Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Second Edition, Galgotia Publications, New Delhi, 2013

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**
SEMESTER – IV

18IT415	SOFTWARE ENGINEERING PRINCIPLES AND PRACTICES	L 3	T 0	P 0	C 3

Prerequisite: No prerequisite needed for enrolling into the course

Objectives:
- *To analyze the software life cycle models*
- *To be exposed to techniques for the requirement analysis and design of complex software intensive systems*
- *To be familiar with design concepts and architectural design*
- *To know knowledge of testing and managing the multidisciplinary software*
- *To gain the knowledge on product development with an awareness of individual professional and ethical responsibilities*

UNIT – I   THE SOFTWARE PROCESS   [9]

Software Engineering: Generic View of Process - Software Engineering Practice - Software Process Model: Prescriptive Models - Waterfall Models - Increment - Evolutionary and Specialized model - Comparison Study of Software Process Models – Agile Process and Models

UNIT – II   REQUIREMENTS ANALYSIS AND SPECIFICATION   **[9]**

Requirements Analysis: Requirements Engineering Tasks - Initialization of the Requirement Engineering Process - Eliciting Requirements - Building the Analysis Model - Validating Requirements - Building the Analysis Model - Requirements Analysis - Model Approaches - Data Modeling Concepts - Scenario Based - Flow Oriented Modeling - Class Based Modeling - Behavioral Modeling - Case Study: Software Requirements Specification (SRS) for Application Project.

UNIT – III   DESIGN CONCEPTS AND ARCHITECTURAL DESIGN   **[9]**

Design Engineering: Design within the Context of Software Engineering - Design concepts - Design model -. Architectural design: Software Architecture - Architectural Styles - Architectural Design - Mapping Design Flow into Software Architecture – Introduction to Modeling with UML Language and Design Based on Case Study of SRS.

UNIT – IV   SOFTWARE TESTING STRATEGIES AND STACTICS   **[9]**

Testing strategies: Strategic Approach to Software Testing - Strategic Issues - Testing Strategies for Conventional Software - Object Oriented Software - Validating Testing - System Testing - Art of Debugging. Testing Tactics: Software Testing Fundamentals - White Box Testing - Basis Path Testing - Control Structure Testing - Black Box Testing -Testing for Specialized Environments - Architectures and Applications - Patterns for Software Testing - Case Study of Software Testing Tools.

UNIT – V   MANAGING SOFTWARE PROJECT   **[9]**

Project Management - Spectrum - People - Product and Process - Empirical Estimation Models - Scheduling: Timeline Chart and Tracking the Schedule - Risk management: Risk Identification - Projection and RMMM Plan - SCM Process - SQA Activities and Formal Technical Reviews - ISO 9000 Quality Standards - Emerging Trends in Software Engineering.

Total = 45 Periods

Course Outcomes: On Completion of the course, the students will be able to
  CO1: Apply the principles of software engineering to real time application with practicing models
  CO2: Perform the requirement specification and design and implementation of software systems
  CO3: Design the processes and quality architecture to the specific needs
  CO4: Discuss various software testing strategies
  CO5: Create the software project with quality product

Text Books :

1   Roger S. Pressman, Software Engineering: A Practitioner Approach, McGraw-Hill ,Seventh Edition,2010

2   Ian Sommerville, Software Engineering, Sixth Edition, Pearson Education, New Delhi, 2011

Reference Books :

1   Jalote P , An Integrated Approach to Software Engineering, Third Edition, Narosa Publishers, New Delhi, 2015

SEMESTER – IV

		L	T	P	C
18IT421	**DATABASE SYSTEMS LABORATORY**	0	0	3	1

Prerequisite: *No prerequisite needed for enrolling into the course*

Objectives:

- *To learn DDL, DML and DCL commands*
- *To be exposed on database connectivity*
- *To learn to use the forms and triggers in PL/SQL*
- *To gain practical knowledge on importing and exporting of data*
- *To get hands on experience regarding report generation in visual Basic*

List of Experiments:

1. Implementation of DDL Commands.

2. Implementation of DML Commands.

3. Implementation of DCL Commands

4. Programming with database connectivity (With a front end).

5. Forms.

6. Triggers.

7. Integrity in SQL.

8. Importing / Exporting data.

9. Report generation in Visual Basic.

10. Database design and implementation (application development).

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
   CO1: Create database with different types of integrity constraints and use the SQL Commands
   CO2: Develop PL/SQL blocks to access and manipulate data
   CO3: Build the program with data connectivity
   CO4: Create database to Import and export data
   CO5: Create report generation in visual basic

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – IV**</u>

18IT422	COMPUTER NETWORKS LABORATORY	L	T	P	C
		0	0	3	1

Prerequisite: *Principles of Communication*

Objectives:

- *To learn socket programming to build a networking application*
- *To learn about RPC*
- *To know about Sub netting*
- *To gain knowledge on TCP and UDP sockets*
- *To be familiar with simulation tools*

List of Experiments:

1. Implementation of stop and wait protocol and sliding window protocol.
2. Study of socket programming and client server model.
3. Write a code simulating ARP /RARP protocols.
4. Write a code simulating PING and TRACEROUTE commands.
5. Create a socket for HTTP for web page upload and download.
6. Write a program to implement RPC (Remote Procedure Call).
7. Implementation of Subnetting.
8. Applications using TCP sockets.
9. Applications using TCP and UDP sockets.
10. Study of Network Simulator (NS) and simulation of congestion control algorithms.
11. Perform a case study about the different routing algorithms.

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Analysis on Simulation tools
CO2: Build various protocols
CO3: Develop Socket Programming
CO4: Build routing algorithm
CO5: Analyze congestion control algorithm

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – IV**</u>

18IT423	**DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**1**

Prerequisite: Programming for Problem solving using C

Objectives:

- *To analyze a problem and design the solution for the problem*
- *To implement the sorting algorithms*
- *To implement minimum spanning tree algorithm*
- *To gain knowledge on shortest path algorithms*
- *To create program for real time applications using Data Structures*

List of Experiments:

Implementation of the following concepts:

1. Implementation of Merge Sort Algorithm.
2. Implementation of Quick Sort Algorithm.
3. Implementation of Selection Sort Algorithm.
4. Implementation of Heap Sort Algorithm.
5. Implementation of Binary Search Algorithm.
6. Implementation of Minimum Spanning Tree Algorithm.
7. Implementation of Knapsack Algorithm.
8. Implementation of All Pair Shortest Path Algorithm.
9. Implementation of Eight Queens Problem.
10. Implementation of Travelling Salesman Problem.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

    CO1: Discuss about Various sorting algorithms

    CO2: Analyze various searching algorithms

    CO3: Develop minimum spanning tree

    CO4: Build shortest path algorithm

    CO5: Create Travelling Salesman problem

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - IV**</u>

		L	T	P	C
18HR462	**CAREER DEVELOPMENT SKILLS - II**	0	2	0	0

Prerequisite: No prerequisites are needed for enrolling into the course

Objectives:

- *To make students strong on verbal and logical reasoning*
- *To strengthen students on number system*
- *To develop students on logarithms*
- *To interpret and comprehend a given text.*
- *To strengthen students on quick maths*

UNIT – I   VERBAL AND LOGICAL REASONING – PART 1   **[6]**

. Alphabet Test - Synonyms & Antonyms - Idioms & Phrases - Analogies - Theme Detection - Odd Words - Statement & Conclusions - Family Tree - Blood Relations - Coding & Decoding - Syllogism - Odd Man Out.

UNIT – II   QUANTITATIVE APTITUDE – PART 1   **[6]**

Numbers : Number system - Squaring of Numbers - Square Roots - Cube Roots - Divisibility - HCF , LCM - Decimals.

UNIT – III   QUANTITATIVE APTITUDE – PART 2   **[6]**

Percentages - Averages - Ratio & Proportion - Mixtures and Allegations - logarithms.

UNIT - IV   READING COMPREHENSION &WRITTEN COMMUNICATION – PART 3   **[6]**

READING SKILLS : Importance of Reading - Definition of Reading - Levels of Reading - Requirements of Reading - Types of Reading – Techniques of Reading - Academic Reading Tips.

What is Writing - Sentence - Phrase - Kinds of Sentences - Parts of Sentence - Parts of Speech - Articles - Academic Essay Writing - Precise Writing - Report Abstracts - Letter Writing - Memo - Cover Letter - Resume Writing.

UNIT –V   QUANTITATIVE APTITUDE – PART 3   **[6]**

Profit and Loss - Simple Interest & Compound Interest - Problem on Ages - Calendar.

Total = 30 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Speak and write appropriately by understanding and applying the basic grammatical rules.

CO2: Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

CO3: Enhance their communication skills and instructiveness.

CO4: Enhance interpersonal relationship building skills with self – confidence.

CO5: Evaluate various real life situation by resorting to analysis of key issues and factors.

Text Books:

1   Anne Laws, Writing Skills, Orient Black Swan., Hyderabad, 2011.
2   Abhijit Guha, Quantitative Aptitude, TMH,Third Edition,2009.

Reference Books :

1 Agarwal. R.S, A.Modern Approach to Verbal and Non- verbal Reasoning, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.

2 Sarah Freeman, Written Communication in English, Orient Black Swan, Hyderabad, First Edition, 2015.

3 M.B. Lal & Goswami, Objective Instant Arithmetic, Upkar Publications, First Edition, 2010.

4 Norman Lewis, Word Power Made Easy,W.R.Goyal Publications,Reprint, 2012.

    5 M Ashra Rizvi, Effective Technical Communication, Tata McGraw HILL, New Delhi, First Edition, 2005

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

SEMESTER – V

18EC532   **MICROCONTROLLER AND EMBEDDED SYSTEMS**

L	T	P	C
3	0	0	3

Prerequisite: *No prerequisites needed for enrolling into the course*

Objectives:
- *To know about the basics of 8-bit embedded controller.*
- *To understand the basic concepts of embedded systems.*
- *To gain knowledge about embedded programming.*
- *To learn the concepts of RTOS.*
- *To understand various embedded development tools and study some case studies*

UNIT – I   **8 BIT EMBEDDED CONTROLLER**   **[9]**

8051 Microcontroller - Introduction - Architecture - Instruction set - I/O ports and circuits – External memory interfacing - counters and timers – Interrupts

UNIT – II   **INTRODUCTION TO EMBEDDED SYSTEMS**   **[9]**

Embedded system: Introduction - Categories - Recent trends - Overview of architecture: Hardware architecture - Software architecture - Application software - Communication Software – Major application areas – Design life cycle

UNIT – III   **EMBEDDED PROGRAMMING**   **[9]**

Software programming in assembly and high level language - Program elements: Macros and functions - Data types - Data structures -, modifiers - statements - loops and pointers - Object oriented programming - Embedded programming in C++ - Embedded programming in JAVA -- Program models - DFG models - State machine programming models for event controlled program flow - Modeling of multiprocessor systems - UML modeling.

UNIT – IV   **REAL TIME OPERATING SYSTEMS**   **[9]**

Multiple tasks and processes - Semaphore and its functions - Inter process communication - Message queue functions - Mailbox functions - Pipe functions - Socket functions - OS services - Process management -Timer functions - Event functions -- Memory management - Interrupt routines in RTOS environment and handling of interrupt source calls

UNIT – V   **EMBEDDED SOFTWARE DEVELOPMENT**   **[9]**

Embedded software development processes and tools - Debuggers and Emulators - Introduction and features of MUCOS II - VxWorks - Design issues in embedded system development - Case studies: Automatic chocolate vending machine - Adaptive cruise control.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Interpret the concept about 8-bit embedded controller
CO2: Compare and contrast various Soft Computing Frameworks
CO3: Develop programs for embedded system at the basic level
CO4: Explain the various functions and services in Real Time Operating Systems
CO5 : Model real time applications using embedded system concepts.

Text Book :

1. Raj Kamal, Embedded Systems Architecture, Programming and Design, McGraw-Hill Education, New Delhi, Second Edition, 2011
2. Prasad K.V.K.K, Embedded Real-Time Systems: Concepts, Design & Programming, Dream Tech Press, New Delhi, First Edition, 2015.

Reference Books :

1. David E. Simon, An Embedded Software Primer, Addison-Wesley Professional, United States, First Edition, 2007
2. Daniel .W Lewis, Fundamentals of Embedded Software, Prentice Hall India Learning, New Delhi, 2003
3. J Jean J. Labrosse, MicroC/OS - II The Real Time Kernel, CRC Press Publisher, United States, Second Edition, 2002.
4. http://nptel.ac.in/courses/108102045.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

SEMESTER – V

18IT511	DATA ANALYTICS	L	T	P	C
		3	0	0	3

Prerequisite: Database Languages

Objectives:
- *To be exposed to Big Data*
- *To learn the different ways of Data Analysis*
- *To be familiar with Data Streams*
- *To learn the Mining and Clustering*
- *To be familiar with the Visualization*

UNIT – I   INTRODUCTION TO BIG DATA   [9]

Introduction to Big Data Platform - Challenges of conventional systems - Web Data - Evolution of Analytic Scalability- Analytic processes and tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical concepts: Sampling Distributions - Re sampling - Statistical Inference - Prediction Error

UNIT – II   DATA ANALYSIS   [9]

Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector   and K ernel Methods - Analysis of T ime S eries: Linear Systems A nalysis - N onlinear D ynamics - Rule I nduction - Neural Networks - Learning and Generalization - Competitive Learning - Principal Component Analysis and Neural Networks - Fuzzy Logic: Extracting Fuzzy models from Data - Fuzzy Decision Trees – Stochastic Search Methods

UNIT – III   MINING DATA STREAMS   [9]

Introduction to Streams Concepts - Stream Data Model and Architecture - Stream Computing- Sampling data in a stream - Filtering Streams - Counting distinct elements in a stream - Estimating moments - Counting oneness in a window - Decaying window - Real-Time Analytics Platform(RTAP) applications - Case Studies - Real Time Sentiment Analysis – Stock Market Predictions

UNIT – IV   FREQUENT ITEMSETS AND CLUSTERING   [9]

Mining Frequent item sets - Market based model - Apriori Algorithm - Handling large data sets in Main memory - Limited Pass Algorithm - Counting Frequent item sets in a stream - Clustering Techniques - Hierarchical - K- Means Clustering High Dimensional Data - CLIQUE and PROCLUS - Frequent Pattern based Clustering Methods - Clustering in non-Euclidean Space -Clustering for Streams and Parallelism

UNIT – V   FRAMEWORKS AND VISUALIZATION   [9]

Map Reduce - Hadoop - Hive - MapR - Sharding - NoSQL Databases - S3 - Hadoop Distributed File Systems - Visualizations - Visual Data Analysis Techniques - Interaction Techniques - Systems and Applications

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Apply the Statistical Analysis Methods
CO2: Compare and contrast various Soft Computing Frameworks
CO3: Design distributed File Systems
CO4: Apply Stream Data Model
CO5 : Discuss Visualization Techniques

Text Book :

1   Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2013

2   Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Data sets, Cambridge University Press, 2012

Reference Books :

1   Bill Franks, Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analytics, John Wiley & sons, 2012

2   Glenn J. Myatt,Making Sense of Data, John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O" Reilly, 2011

3   Jiawei Han- Micheline Kamber ,Data Mining Concepts and Techniques, Second Edition, Elsevier, Reprinted 2012

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**
SEMESTER - V

		L	T	P	C
18IT512	**THEORY OF COMPUTATION**	3	1	0	4

Prerequisite: Discrete Mathematics
Objective(s):

- *To be familiar with regular languages*
- *To learn about grammars and normal forms*
- *To know about pushdown automata and context free languages*
- *To understand the power of Turing Machines*
- *To be aware of Decidability and Un-decidability of various problems*

UNIT – I   REGULAR LANGUAGES   [12]

Regular Expression - FA and Regular Expressions - Pumping lemma for Regular languages - Equivalence and minimization of Finite Automata - Finite Automata (FA) - Deterministic Finite Automata (DFA) - Non-deterministic Finite Automata (NFA) - Finite Automata with Epsilon transitions

UNIT – II   GRAMMARS   [12]

Grammar Introduction - Types of Grammar - Context Free Grammars and Languages - Derivations and Languages -Ambiguity - Relationship between derivation and derivation trees -Simplification of CFG- Elimination of Useless symbols - Unit productions - Null productions - Greibach Normal form - Chomsky normal form – Problems related to CNF and GNF

UNIT – III   PUSHDOWN AUTOMATA   [12]

Pushdown Automata - Definitions - Moves - Instantaneous descriptions - Deterministic pushdown automata - Equivalence of Pushdown automata and CFL - Pumping lemma for CFL - Problems based on pumping Lemma

UNIT – IV   CLOSURE PROPERTIES AND TURING MACHINES   [12]

Closure properties of Regular Sets: Complement and Intersection - Closure properties of CFL: Union - Concatenation - Kleene Closure - Intersection and Complement - Turing Machines - Language of a Turing machine - Turing machine as a computing device - Various techniques for construction of TMs - Equivalence of one tape and multitape Turing machines

UNIT – V   UNDECIDABILITY   [12]

A language that is not Recursively Enumerable (RE) - An undecidable problem that is RE - Undecidable problems about Turing Machine - Rice theorem for Recursive and Recursively enumerable languages - Post"s Correspondence Problem

Total (L: 45 T: 15) = 60 Periods

Course Outcomes: On completion of this course- the student will be able to

> *CO1: Design finite automata for the given regular expression*
> *CO2: Solve problems related to context free grammar CO3:*
> *Design push down automata for the context free language*
> *CO4: Construct Turing machine for the computational problems*
> *CO5:Explain the Decidability or undecidability of various problems*

Text Books :

1 Hopcroft J.E., Motwani R. and Ullman J.D, Introduction to Automata Theory, Languages and Computations, Third Edition, Pearson Education, 2011
2 John C Martin, Introduction to Languages and the Theory of Computation, Tata McGraw Hill Publishing Company, New Delhi, Third Edition, 2012

Reference Books :

1 Mishra K L P and Chandrasekaran N, Theory of Computer Science , Automata, Languages and Computation, Third Edition, Prentice Hall of India, 2014
2 Harry R Lewis and Christos H Papadimitriou, Elements of the Theory of Computation, Second Edition, Prentice Hall of India, Pearson Education, New Delhi, 2013
3 Peter Linz, An Introduction to Formal Language and Automata, Third Edition, Narosa Publishers, New Delhi, 2012.
4 Kamala Krithivasan and Rama. R, Introduction to Formal Languages, Automata Theory and Computation, Pearson Education 2012

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - V

18IT513	JAVA PROGRAMMING	L	T	P	C
	(Common to IT & ME)	3	0	0	3

Prerequisite: *Fundamentals of Object Oriented Programming Concepts*
Objective(s):

- *To understand the fundamentals of Java programming language.*
- *To equip students with comprehensive knowledge on core concepts of java like overloading, inheritance, packages, interfaces and exception handling.*
- *To gain knowledge on threads and multithreaded programming*
- *To understand the I/O operations and string manipulations*
- *To gain knowledge on database connectivity*

UNIT – I   JAVA FUNDAMENTALS   [9]

Features and components of Java - Architecture of JVM - Structure of a Java class and source code file - primitive variables - Object reference variable - Scope of variables - Operators - Control Statements - Access and non-access modifiers – Object"s Life Cycle – Garbage Collection

UNIT – II   CLASS DESIGN AND INHERITANCE   [9]

Package Declaration - Importing Packages: import and static imports - Method: Objects as Parameters - Returning Objects - Method Overloading - Constructor - Constructor Overloading - Nested and Inner Class - Inheritance: Multilevel - Hierarchical - Method Overriding - Interface - this and super

UNIT – III   CORE JAVA APIS AND EXCEPTION HANDLING   [9]

Creating and manipulating: Strings - String Builder - Arrays - Array List - Wrapper Classes - Working with Dates and Times - Exceptions : Categories - try - catch - finally blocks - throw and throws - Error

UNIT – IV   MULTITHREADING AND I/O OPERATIONS   [9]

Thread Life Cycle - Creating Thread - Thread Priority - Thread Pool and Group - Synchronization: synchronized block - Static Synchronization - Deadlock - Interthread Communication - Hierarchy for Package java.io - Input and output streams – Random access files.

UNIT – V   COLLECTIONS AND JDBC   [9]

Hierarchy of Collection Framework: Linked List - Queue - Hash Set - Linked Hash Set - Tree Set - JDBC API: JDBC Driver Manager - JDBC - ODBC Bridge - JDBC Architecture - Establishing Connection - Handling SQL Exceptions

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

> *CO1: Apply java programming fundamentals to solve real world problem*
> *CO2: Summarize the concept of overloading and inheritances*
> *CO3: Analyze important features of java like packages- interfaces and exception handling*
> *CO4: Illustrate the features of multithreaded programming and I/O operations*
> *CO5: Interpret the concepts of string manipulations and database connectivity*

Text Books :

1 Herbert Schildt, Java - The Complete Reference, Oracle Press, McGraw Hill Education, 10th Edition, 2018
2 Cay S. Horstmann, Core Java Volume 1 - Fundamentals, Prentice Hall, 10th Edition, 2015

Reference Books :

1 Herbert Schildt, Java - A Beginner Guide, Oracle Press, McGraw- Hill Education, 6th Edition, 2014
2 Joshua Bloch, Effective Java: A Programming Language Guide, Addison Wesley Professional, 3rd Edition, 2018
3 Allen B. Downey and Chris Mayfield, Think Java: How to Think Like a Computer Scientist, O'Reilly, 1st Edition, 2016
4 https://onlinecourses.nptel.ac.in/noc19_cs07/preview

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　　**R 2018**

SEMESTER – VII

		L	T	P	C
18HS002	**TOTAL QUALITY MANAGEMENT** **(Common to AU, CS, EE, IT & ME Branches)**	3	0	0	3

Objective(s):
- *To explain the basic concepts of total quality management.*
- *To explain the Various principles of total quality management.*
- *To describe the various statistical process control concepts.*
- *To discuss the various tools in Total quality management*
- *To explain the different quality systems in manufacturing and service sectors*

UNIT - I　　INTRODUCTION　　　　　　　　　　　　　　　　　　　[9]

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM - TQM implementation steps - Quality council-Importance of leadership and motivation in TQM - Contributions of Deming - Juran and Crosby - Barriers to TQM.

UNIT - II　　TQM PRINCIPLES　　　　　　　　　　　　　　　　　　[9]

Quality statements - Customer perception of quality - Customer complaints - Customer retention - Employee involvement - Empowerment - Team and Teamwork - Recognition and Reward - Continuous process improvement - Juran trilogy - PDSA cycle - 5s - 8D Methodology - Supplier partnership - Partnering - Supplier selection - Supplier Rating.

UNIT - III　　STATISTICAL PROCESS CONTROL　　　　　　　　　　[9]

The seven traditional tools of quality - Measurement of central tendency and dispersion - Population and sample - Normal curve - Control chart (X,R,p) for variable and attributes - Process capability - Seven new management tools - Six-sigma Concepts.

UNIT - IV　　TQM TOOLS　　　　　　　　　　　　　　　　　　　　[9]

Bench marking - Reason - Process - Quality circles concepts - FMEA - Stages - Types- Quality Function Deployment (QFD) - Taguchi quality loss function -TPM - Concepts - Improvement needs - Performance measures-criteria - Quality Cost.

UNIT - V　　QUALITY SYSTEMS　　　　　　　　　　　　　　　　　[9]

Need for ISO 9000 - ISO 9001-2014 - ISO 14000 - Quality System - Elements - Implementation - Documentation - Quality auditing - Concepts - Requirements and benefits - Non-conformance report - Case studies of TQM implementation in manufacturing and service sectors

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to:
    CO1: Explain the fundamental concepts of total quality management
    CO2: Illustrate the Various TQM principles for continuous process improvement
    CO3: Classify the statistical tools to control and improve the quality of the products and services.
    CO4: Describe the tools and techniques to improve the quality concept
    CO5: Explain the quality system in manufacturing and service sectors.

Text Books :

1. Dale H.Besterfiled, et at., Total Quality Management, Pearson Education Asia, Indian Reprint, New Delhi, Third Edition, 2016
2. Janakiraman,B and Gopal, R.K, Total Quality Management - Text and Cases,Prentice Hall (India) Pvt. Ltd., New Delhi, Third Edition, 2015

Reference Books :

1. Suganthi,L and Anand Samuel, Total Quality Management, Prentice Hall (India)Pvt. Ltd.,, New Delhi, Frist Edition, 2014
2. James R. Evans and William M. Lindsay, The Management and Control of Quality,South-Western (Thomson Learning), New Delhi,Ninety Edition, 2015
3. Subburaj R, Total Quality Management, Tata McGraw Hill, New Delhi, Frist Edition, s2014
4. EugenceMckenna and Nic Beach, Total Quality Management, Pearson Education Limited, New Delhi, Second Edition, 2014

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - V**</u>

18EC027	**EMBEDDED SYSTEMS LABORATORY**	L	T	P	C
		0	0	3	1

Prerequisite: *No prerequisites needed for enrolling into the course.*

Objectives:
- *Introduce the basics of microcontroller and its applications.*
- *Impart the I/O interfacing concepts for developing real time embedded systems.*
- *Learn the programming for motor control*
- *Expertise working with Keil compiler and embedded C programming for arithmetic and logic instructions*
- *Expertise working with Keil compiler and embedded C programming for various codes*

List of Experiments:

    . 1. 8051 Microcontroller
        a. Arithmetic Operations
        b. Logical and Bit Manipulation

    2. Peripheral Interfacing
        a. Programmable peripheral interface (8255) using 8051.
        b. ADC and DAC using 8051.
        c. Stepper motor using 8051.

    3. Programming using KEIL Software.
        a. Data Transfer - Block move, Exchange, Sorting, Finding largest element in an array.
        b. Arithmetic Instructions - Addition/subtraction, multiplication and division, square, Cube.
        c. Counters.
        d. Boolean & Logical Instructions (Bit manipulations).
        e. Code conversion: BCD - ASCII; ASCII - Decimal; Decimal - ASCII.
        f. HEX - Decimal and Decimal - HEX.

Total = 45 Periods

Course Outcomes: Upon Completion of this course- the students will be able to
    CO1: Programming the 8-bit Micro controller for arithmetic and logical operations.
    CO2: Analyze the various interfacing with 8-bit embedded controller.
    CO3: Demonstrate the Keil µVision software.
    CO4: Develop the Programming for data transfer applications.
    CO5: Develop the Programming for various coding.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - V**</u>

18IT521	**DATA ANALYTICS LABORATORY**	L	T	P	C
		0	0	3	1

Prerequisite: Database Management Systems

Objective(s):

- ▪ *To learn about Hadoop and HDFS.*
- ▪ *To implement Map Reduce programs for processing big data*
- ▪ *To realize storage of big data using H base- Mongo DB*
- ▪ *To analyze big data using linear models*
- ▪ *To analyze big data using machine learning techniques such as SVM / Decision tree classification and clustering*

List of Experiments:

1. Install configure and run Hadoop and HDFS.
2. Implement word count / frequency programs using MapReduce.
3. Implement an MR program that processes a weather dataset.
4. Implement Linear and logistic Regression.
5. Install and run R programming then use programming statements (if statement- for loop and own function).
6. Implement SVM / Decision tree classification techniques.
7. Implement clustering techniques.
8. Visualize data using any plotting framework.
9. Implement an application that stores big data in Hbase / MongoDB / Pig using Hadoop / R.

Total = 45 Periods

Course Outcomes*: **Upon Completion of this course- the students will be able to***
    CO1: Analyze big data using Hadoop framework
    CO2: Build and apply linear and logistic regression models
    CO3: Discuss data analysis with machine learning methods
    CO4: Evaluate graphical data analysis
    CO5: Interpret how to run R programming

SEMESTER - V

		L	T	P	C
18IT522	**JAVA PROGRAMMING LABORATORY**	0	0	3	1

Prerequisite: Basic knowledge of Object Oriented Concepts

Objective(s):

- *To equip students with comprehensive knowledge on Java programming by hands on experiment*
- *To gain practical knowledge on Java in order to meet the industrial standards*
- *To understand the concept of Constructor Overloading and Packages*
- *To gain knowledge on database Connectivity and Collections*
- *To identify, analyze and apply the features of java to find optimal solution for the real world problem*

List of Experiments:

1. Write a program to read n elements in array remove duplications and Display them in sorted order.
2. Write a program for college management system to illustrate the concept of constructor overloading and method overloading.
3. Write a program to illustrate hierarchical inheritance and interface for student information system.
4. Write a program for employee management system using packages and import statements.
5. Write a program to perform calculator operations using exception handling
6. Write a program for the illustration of string and string builder manipulationfunctions.
7. Write a program for threads (extending Threads class and implementing Runnable interface)
8. Write a program to implement student details using database connectivity
9. Write a java program to implement the concept of collections.
10. Write a java program to illustrate the various I/O and file operations.

Total = 45 Periods

Course Outcomes: Upon Completion of this course- the students will be able to

CO1: Identify and apply the features of java to find optimal solution for the real world problem
CO2: Utilize the concept of arrays, constructors, inheritance and overloading
CO3: Build the program using interface, packages and import statements
CO4: Make use of the features of exception handling, string manipulations and threads
CO5: Develop the java program with database connectivity

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

<u>SEMESTER - V</u>

18HR563	**CAREER DEVELOPMENT SKILLS – III**	L	T	P	C
		0	2	0	0

Prerequisite: *No prerequisites are needed for enrolling into the course*
Objectives:
- *To enhance the writing and speaking skills through continuous practices*
- *To sharpen the verbal and logical reasoning through skillful conceptualization*
- *To improve the learning skills of students in aptitude*
- *To learn the problem solving skill and to improve thinking capability of the students*
- *To study the various concept in core subjects*

UNIT –- I   WRITTEN AND ORAL COMMUNICATION – PART 1   **[6]**

Reading Comprehension Level 3 - Self Introduction - News Paper Review - Self Marketing - Debate - Structured and Unstructured GDs Psychometric Assessment - Types & Strategies to answer the questions Practices: Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Interpretation of Pictorial Representations - Editing

UNIT – II   VERBAL & LOGICAL REASONING – PART 2   **[6]**

Syllogism - Assertion and Reasons - Statements and Assumptions - Identifying Valid Inferences - identifying Strong Arguments and Weak Arguments - Statements and Conclusions - Cause and Effect - Deriving Conclusions from Passages - Seating Arrangements Practices: Analogies - Blood Relations - Statement & Conclusions

UNIT – III   QUANTITATIVE APTITUDE – PART 3   **[6]**

Probability - Calendar - Clocks - Logarithms - Permutations and Combinations

UNIT – IV   QUANTITATIVE APTITUDE – PART 4   **[6]**

Algebra - Linear Equations - Quadratic Equations - Polynomials - Problem on Numbers - Ages - Train - Time and Work – Sudoku – Puzzles

UNIT – V   DOMAIN PROFICIENCY   **[6]**

Data Structure - Operating System - Database Technology - Computer Architecture - Computer Networks

Total = 30 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
CO1: Understand the nearness of leading various texts.
CO2: Perform well in verbal and logical reasoning.
CO3: Understand and develop the etiquette necessary to present oneself in a professional setting.
CO4: Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken
*   for performing job functions.*
CO5: Enhance the comprehension Skills in core subjects.

Text Books:
1 Anne Laws, Writing Skills, Orient Black Swan., Hyderabad, 2011
2 Abhijt Guha, Quantitative Aptitude, TMH, Third Edition,New Delhi, 2009

Reference Books:
1   M Ashra Rizvi, Effective Technical Communication, Tata McGraw HILL, New Delhi, First Edition, 2005
2   Sarah Freeman, Written Communication in English, Orient Black Swan, Hyderabad, First Edition, 2015
3   M.B. Lal & Goswami, Objective Instant Arithmetic, Upkar Publications, First Edition, 2010
4   Norman Lewis, Word Power Made Easy,W.R.Goyal Publications,Reprint, 2012
5   V.K. Mehta & Rohit Mehta, Objective Electrical Technology, S Chand publications,First Edition, 2012

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - VI

			L	T	P	C
18IT611		**WEB TECHNOLOGY**	3	1	0	4

Prerequisite: No prerequisite needed for enrolling into the course

Objective(s):

- To gain knowledge of Internet Fundamentals, HTML and CSS
- To create an interactive and semantic web page using Java scripts.
- To equip the students to program in server side scripting, PHP and MySQL.
- To develop interactive web applications using AJAX and web services.
- To understand and discuss the concepts of Angular JS

UNIT – I   HTML and CSS   [12]

Web Essentials: World wide web - HTTP Request and Response Message - HTML5 : Tables - Lists - Forms - Graphics - Media - APIs - CSS3: Types and Selectors - Margin and Padding - Position - Transformations and Transitions - Animations - Responsive - Grid.

UNIT -- II   JavaScript   [12]

JavaScript : Data Types - Variable - Operators - Arrays - Object Properties Configuration - DOM Tree : Searching - Node properties - Attributes and Properties - Element Size and Scrolling - Events : UI Events - Forms and Controls - Frames and Windows

UNIT -- III   PHP and MYSQL   [12]

PHP: Variables - Strings - Operators - Flow Control - Array- Function - PHP Forms - Cookies - Session - JSON - Exception - MySQL : Connect – Create DB – Insertion – Deletion – Update

UNIT – IV   AJAX AND WEB SERVICES   [12]

AJAX: Ajax Client Server Architecture - XML HTTP Request Object - Web Services: Java Web Services Basics - Creating, Publishing, Testing and Describing a Web Services (WSDL) - Consuming a web service - Database Driven web service from an application – Restful

UNIT– V   Angular JS   [12]

Angular JS Framework **:** MVC Architecture - Directives - Expressions and Controllers - HTML DOM - Modules - Ajax - View - Scope – Services – Internationalization

Total (L: 45 T: 15) = 60 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Construct a basic website using HTML and Cascading Style Sheets
CO2: Build dynamic web page with validation using Java Script objects
CO3: Construct simple web pages in PHP and to represent data in MySQL.
CO4: Construct AJAX and web services to develop interactive web applications
CO5: Demonstrate Angular JS and build a user interface applications

Text Book:

 1 Paul Deitel, Harvey Deitel, Abbey Deitel, "Internet & World Wide Web: How to Program", 5th Edition, Pearson Publication, 2011
 2 Jeffrey C and Jackson, Web Technologies A Computer Science Perspective‖, Pearson Education, 2011

Reference Books :

1 Jon Duckett, "Web Design with HTML, CSS, JavaScript and jQuery Set", 1st Edition, Wiley Publication, 2014
2 Luke Welling,Laura Thomson. "PHP and MySQL Web Development, 4th Edition, Addison-Wesley Professional, 2009
3 Brad Dayley, "Node.JS, MongoDB, and AngularJS Web Development", Addison-Wesley, 2014
4 Rebecca.M.Riordan,"Head First Ajax : A Brain-Friendly Guide",O"Reilly Media,2009
5 https://javascript.info/

SEMESTER –VI

18IT612	SOFTWARE TESTING	L	T	P	C
		3	0	0	3

Prerequisite: *Software Engineering Principles and Practices*
Objective(s):

- *To highlight the strategies for software testing*
- *To stress the need and conduct of testing levels*
- *To identify the issues in testing management*
- *To bring out the ways and means of controlling and monitoring testing activity*
- *To know about the test cases and review process*

UNIT – I   INTRODUCTION TO TESTING   [9]

Software Testing - Definition of Software Testing - Objective and limits of testing - Testing Strategy - Roles and Responsibilities of a Software Tester - Independent Verification and Validation

UNIT – II   SOFTWARE TESTING REQUIREMENTS   [9]

Software Testing Requirements - Analyzing the requirements -Classifying the Functional and Non Functional Requirements. Software Testing Review Process - Objective of Software Testing Review - Types of Reviews: Peer Review - Walkthrough - Inspection - Checklists of Review Process - Review Log

UNIT – III   TESTING TECHNIQUES   [9]

White box testing techniques - Static and Dynamic Testing - Statement Coverage - Decision/Branch Coverage - Basic Path Testing - Control Flow Graph Coverage - Conditional Coverage - McCabe"s Cyclomatic Complexity - Mutation Testing - Black Box Test Techniques: Boundary Value Analysis - Equivalent Class Partition - Cause-Effect Analysis - Decision Table - State Transition Table - Pair Wise Testing - Use Case Testing

UNIT – IV   TESTING TYPES   [9]

Unit Testing, Functional Testing: Smoke Testing - Integration - System Testing - User Acceptance Testing - Non Functional Testing:- Performance Testing - Recovery Testing - Security Testing - Compatibility Testing - Usability Testing - Ad Hoc Testing - Internationalization Testing - Configuration Testing - Data ware House Testing and Business Intelligence Testing – SOA Testing – Mobile Testing

UNIT – V   TEST CASE DESIGN   [9]

Definition of Test Case - Standards - Guidelines and Naming Conventions - Characteristics of Good Test Cases - Test Case templates - Creation of Test Case - Requirement Coverage -Traceability Matrix - Test Case Review Process - Test Execution - Test Log - Reporting of Test Execution - Definition of Risk - Risk Based Testing Approach

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Summarize the strategies for software testing
CO2: Interpret the concept of various testing levels
CO3: Identify the issues in testing management
CO4: Identify the ways and means of controlling and monitoring testing activity
CO5: Discuss about the test cases and review process

Text Books :
1   S.Subashni, N.Satheesh Kumar, Dr.B.G.Geetha, Dr.G.Singaravel, Software Testing, Umayam Publications, First Edition, 2013
2   Srinivasan Desikan, Gopalaswamy Ramesh, Software Testing: Principles and Practice, Pearson Education India, Second Impression 2017

Reference Books :
1   Roger Pressman, Software Engineering: A Practitioner's Approach, McGraw Publicaions , 7th Edition ,2017
2   MarnieL.Hutchson **,** Software Testing Fundamentals Methods and Metrics, Wiley,2003
3   Glenford J.Myess**,** The Art of Testing, Wiley, 2003
4   Mauro Pezze,Michal Young **,** Software Testing and Analysis: Process, Principles and Techniques, Wiley,2008

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – VI</u>

		L	**T**	**P**	**C**
18IT613	**PRINCIPLES OF COMPILER DESIGN**	**3**	**0**	**0**	**3**

Prerequisite: Theory of Computation
Objective(s):
- To enrich the knowledge in various phases of compiler and its uses
- To learn about syntax analysis
- To explore the knowledge of parser by parsing LL parser and LR parser
- To understand about code generation techniques
- To analyze code optimization techniques, machine code generation and use of symbol table

UNIT – I   NOTION AND CONCEPTS   [9]

Compiler: Language Processors - Structure of a Compiler: Phases of compiler - Compiler Construction Tools - Lexical Analysis: Role of the Lexical Analyzer - Input Buffering - Specification of Tokens - Recognition of Tokens

UNIT – II   SYNTAX ANALYSIS   [9]

Syntax Analysis: Role of the Parser - Context Free Grammars - Top-Down Parsing - Bottom-Up Parsing:Operator precedence - LR Parsing: SLR - Canonical LR - LALR - Parser Generators

UNIT – III   SYNTAX DIRECTED TRANSLATION AND RUN TIME ENVIRONMENT   [9]

Syntax Directed Definitions: Inherited and Synthesized Attributes - Intermediate Code Generation - Three Address Code - Control Flow -.Back patching - Run Time Environments: Storage Organization - Activation Trees and Records

UNIT – IV   CODE GENERATION   [9]

Issues in Design of Code Generation - The Target Language - Addresses in Target Code - Basic Blocks and Flow Graphs - Optimization of Basic Blocks - Simple Code Generator - Peephole Optimization

UNIT – V   CODE OPTIMIZATION   [9]

Principal Sources of Optimization: Local - Global and Loop Optimization - Common Sub-Expression Elimination - Copy Propagation - Dead Code Elimination - Code Motion - Loops in Flow Graphs

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Explain the various phases of compiler and the grammar for the generated tokens
CO2: Develop the parsers and experiment the knowledge of different parsers design
CO3: Construct the intermediate code representations and generation
CO4: Inspect the issues in the design of code generator with cost analysis
CO5: Elaborate the code optimization techniques to improve the performance of a program in terms of speed & space.

Text Books :
1   Alfred V Aho, Monica S. Lam, Ravi Sethi and Jeffrey D Ullman, Compilers - Principles, Techniques and Tools, 2nd Edition, Pearson Education, 2009
2   Grune, D., Van Reeuwijk, K., Bal, H.E., Jacobs, C.J.H., Langendoen K, Modern Compiler Design, Springer Verlag New York, Second Edition, 2012

Reference Books :
1   Raghavan V, Principles of Compiler Design, Tata McGraw-Hill, New Delhi, 2009
2   Allen I. Holub, Compiler Design in C, Prentice Hall of India, 2008
3   V. Raghavan, Principles of Compiler Design, Tata McGraw Hill Education Publishers, 2010
4   https://nptel.ac.in/courses/106/105/106105190/

18IT621	**WEB TECHNOLOGY LABORATORY**	**L**	**T**	**P**	**C**
		0	0	3	1

Prerequisite: *IT Essential*

Objective(s):

- *To learn about web technologies related concepts*
- *To develop Java and HTML based web applications*
- *To implement parsers and XML related concepts*
- *To implement database connectivity*
- *To devise code segments using python*

List of Experiments:

1. Creating simple applications using JAVA by exploring all the OOPS concepts like inheritance, polymorphism, interfaces and packages.

2. Creating GUI based application using JAVA Swings

3. Developing concurrent and generic programming using Threads

4. Creation of simple websites using HTML 5 Tags

5. Creation of web forms and validating it through Javascripts

6. Creation of XML file and validating with DTD and XML schema

7. Working with DOM and SAX parsers

8. Creation of AJAX based application

9. Developing JSON application

10. Creation of dynamic HTML based web applications

11. Creation of servlet based web application with JDBC

12. Developing JSP application

13. Creating simple applications using python

14. Simple database and web application using python

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Explain about web technologies related concepts

CO2: Develop java and html based web applications

CO3: Build parsers and xml related concepts

CO4: Design database connectivity

CO5: Apply python programming concept for developing JSP application

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER – VI

		L	T	P	C
18IT622	**COMPILER DESIGN LABORATORY**	0	0	3	1

Prerequisite: Data Structures

Objective(s):

- *To be able to understand symbol table creation*
- *To be exposed to compiler writing tools*
- *To implement type checking*
- *To implement the different phases of compiler*
- *To be familiar with control flow and data flow analysis*

List of Experiments:

1. Implementation of Symbol Table

2. Develop a lexical analyzer to recognize a few patterns in C. (Ex. Identifiers, constants, comments, operators etc.)

3. Implementation of Lexical Analyzer using Lex Tool

4. Generate YACC specification for a few syntactic categories.

   a). Program to recognize a valid variable which starts with a letter followed by any number of letters or digit

   b). Implementation of Calculator using LEX and YACC

5. Convert the BNF rules into YACC form and write code to generate Abstract Syntax Tree.

6. Implement type checking

7. Implement control flow analysis and Data Flow Analysis

8. Implement any one storage allocation strategies (Heap, Stack, Static)

9. Construction of DAG

10. Implement the back end of the compiler which takes the three address code and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

11. Implementation of Simple Code Optimization Techniques (Constant Folding, Code Motion)

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Develop the different Phases of compiler using tools

CO2: Analyze the control flow and data flow of a typical program

CO3: Construct DAG for a source code

CO4: Construct an assembly language program equivalent to a source language program

CO5: Build the program for simple optimization techniques

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER –VI

18IT623	**MINI PROJECT**	L	T	P	C
		0	0	6	3

Prerequisite: *Core IT courses*

Objectives:

- To equip the students to understand the Problem Definition
- To practice the appropriate strategies and methodologies in SDLC for the real world situations / problems
- To Practice the students for utilizing the modern tools and components
- To provide the students with opportunities to innovate solutions to real-world problems
- To be able to write report effectively

Guidelines:

- Student group comprises of three to four members on a project title under the guidance of a faculty is approved by the head of the department

- The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department.

- Comprehensive project report is submitted after completing the work to the satisfaction of the supervisor.

- The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Identify problems and provide solutions for the real world problems.
CO2: Devise appropriate strategies and methodologies for the problem.
CO3: Utilize modern tools and techniques to obtain the solution for the technical project.
CO4: Test and validate through prototype and measure the cost analysis.
CO5: Communicate and report effectively project related activities and findings.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - VI

18HR664	CAREER DEVELOPMENT SKILLS – IV	L	T	P	C
		0	2	0	0

Prerequisite: *No prerequisites are needed for enrolling into the course*

Objectives:
- *To enhance their writing and reading skills in a technical concept.*
- *To improve their own problem solving skills.*
- *To study the data interpretation and analysis of various methods.*
- *To enhance their own growth opportunities.*
- *To learn the different concepts in core subjects.*

UNIT -- I   WRITTEN AND ORAL COMMUNICATION – PART 2   [6]

Self-Introduction - GD - Personal Interview Skills Practices on Reading Comprehension Level 2 - Paragraph Writing - News paper and Book Review Writing - Skimming and Scanning - Interpretation of Pictorial Representations - Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms& Antonyms - Using the Same Word as Different Parts of Speech – Editing.

UNIT – II   QUANTITATIVE APTITUDE   [6]

Geometry - Straight Line - Triangles - Quadrilaterals - Circles - Co-ordinate Geometry - Cube - Cone - Sphere

UNIT – III   DATA INTERPRETATION AND ANALYSIS   [6]

Data Interpretation based on Text - Data Interpretation based on Graphs and Tables - Graphs Column Graphs - Bar Graphs - Line Charts - Pie Chart - Graphs representing Area - Venn Diagram & Flow Charts

UNIT – IV   RESUME WRITING & PRESENTATION SKILLS   [6]

An Introduction to the Resume - Types of Resumes - Common Resume Errors - Anatomy of a Resume - What is a Cover Letter? - Types of Cover Letters - Enhancing the Language and Style of Your Resume and Cover Letter - Assessment

Presentation Skills: Oral presentation and public speaking skills; business presentations. - Understand the Situation - Know Your Tools - Know Yourself - Organize it - Write the Script - Practice - Delivering a Presentation.

UNIT – V   DOMAIN PROFICIENCY   [6]

JAVA: OOPs Concepts - Packages - Exceptions - Threads - Database Connectivity - PL/SQL : Analytical and Group functions – Joins –.Cursor and Collections

Total (L=0 , T=30) =30 Periods

Course Outcomes : On Completion of this course, the student will be able to

CO1:   *Employ critical thinking in personal interviews type situations*

CO2:   *Understand the Quantitative Aptitude problems in geometry*

CO3:   *Understand the data interpretation and analysis by using various graphs*

CO4:   *Enhance the skills in resume writing and presentation*

CO5:   *Enhance the comprehension Skills in core subjects*

Text Books :

1   Dr.R.S.Aggarwal, Quantitative Aptitude, S. Chand & Company Limited, New Delhi, Sixteenth Edition, 2018.

2   Dr.R.S.Aggarwal, A Modern Approach to Verbal & Non -Verbal Reasoning, S. Chand & Company Limited,New Delhi, Fourth Edition,2015.

Reference Books :

1   M Ashra Rizvi, Effective Technical Communication, Tata McGraw HILL, New Delhi, First Edition, 2005

2   Abhijit Guha, Quantitative Aptitude, TMH,New Delhi, Third Edition,2016.

3   M.B. Lal, Goswami,Objective Instant Arithmetic,Upkar Publications,Delhi, Second Edition,2012.

4   W.R.Norman Lewis,Word Power Made Easy, Goyal Publications,New Delhi, Fourth Edition,2016.

5   B.L Theraja, V.K Pandey,Objective Electrical Technology, S Chand Publications,New Delhi,Fourth Edition,2014.

K.S.R. COLLEGE OF ENGINEERING   (Autonomous)   **R 2018**
SEMESTER – VII

18HS051	**PROFESSIONAL ETHICS** **(Common to All Branches)**	L	T	P	C
		3	0	0	3

Objective(s):
- *To gain the knowledge of basic perception of ethics, moral and values*
- *To know the current Industrial standards*
- *To know the risk and safety benefit in industry*
- *To Discuss the rights and responsibility of an engineers*
- *To Acquire Knowledge in global issues and able to apply in ethical principles in professional life*

UNIT - I   ENGINEERING ETHICS   [9]

Senses of 'engineering ethics' - Variety of moral issued - Types of inquiry - Moral dilemmas - Moral autonomy - Kohlberg's theory - Gilligan's theory - Consensus and controversy - Models of professional roles - Professional ideals and virtues – Uses of ethical theories

UNIT - II   ENGINEERING AS SOCIAL EXPERIMENTATION   [9]

Engineering as experimentation - Engineers as responsible experimenters - Codes of ethics - Industrial standards - Balanced outlook on law – The challenger case study

UNIT – III   ENGINEER'S RESPONSIBILITY FOR SAFETY   [9]

Safety and risk - Assessment of safety and risk - Risk benefit analysis - Reducing risk - Liability - The Chernobyl and Bhopal case studies.

UNIT - IV   RESPONSIBILITIES AND RIGHTS   [9]

Collegiality and loyalty - Respect for authority - Collective bargaining - Confidentiality - Conflicts of interest - Occupational crime - Professional rights - Employee rights - Intellectual Property Rights (IPR) - Discrimination

UNIT - V   GLOBAL ISSUES   [9]

Multinational Corporations - Environmental Ethics - Computer Ethics - Weapons Development - Engineers as Managers - Consulting Engineers-Engineers as Expert Witnesses and Advisors - Corporate Social Responsibility(CSR) - Moral Leadership - Code of Conduct

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1:   Understand the basic perceptions of ethics, moral and values
CO2:   Aware the current industrial standards
CO3:   Identify and access the risk and safety benefits in the industry
CO4:   Aware of professional rights and responsibilities of an engineers
CO5:   Acquire knowledge in global issues and able to apply ethical principles in professional life

Text Books :

1.   Mike Martin and Roland Schinzinger, Ethics in Engineering, McGraw-Hill, Newyork, Fifth Edition, 2017

2.   Dr.K.R.Govindan and S.Senthilkumar, Professional Ethics, Anuradha Agencies, Chennai ,Revised Edition, 2014

Reference Books :
1.   Govindarajan M, Natarajan S, Senthil Kumar V. S, Engineering Ethics, Prentice Hall of India, New Delhi, Fourth Edition, 2016
2.   Charles D. Fleddermann, Engineering Ethics, Pearson Education , Prentice Hall, Newjersy , Seventh Edition, 2015
3.   Charles E Harris, Michael S. Protchard and Michael J Rabins,Engineering Ethics - Concepts and Cases, Thompson Learning, Sixth Edition, 2015
4.   John R Boatright, Ethics and the conduct of Business , Pearson Education, 8th Edition, New Delhi, 2014

K.S.R. COLLEGE OF ENGINEERING   (Autonomous)   **R 2018**

<u>**SEMESTER – VII**</u>

18IT711	**MOBILE APPLICATION DEVELOPMENT**	**L**	**T**	**P**	**C**
	(Common to EE & IT)	**3**	**0**	**0**	**3**

Prerequisite: *No prerequisite needed for enrolling into the course*
Objective(s):

- To understand system requirements for mobile applications.
- To generate suitable design using specific mobile development frameworks.
- To develop mobile application design
- To implement the design using specific mobile development frameworks.
- To deploy the mobile applications in marketplace for distribution.

UNIT – I   INTRODUCTION   [9]

Introduction to mobile applications - Embedded systems - Market and business drivers for mobile applications - Publishing and delivery of mobile applications - Requirements gathering and Validation for mobile applications

UNIT – II   BASIC DESIGN   [9]

Introduction - Basics of embedded systems design - Embedded OS - Design constraints for Mobile applications both hardware and software related - Architecting Mobile applications - User interfaces for mobile applications - touch events and gestures - Achieving quality constraints - Performance, usability, security, availability and modifiability.

UNIT – III   ADVANCED DESIGN   [9]

Designing applications with multimedia and web access capabilities - Integration with GPS and social media networking applications - Accessing applications hosted in a cloud computing Environment - Design patterns for mobile applications

UNIT – IV   TECHNOLOGY I ANDROID   [9]

Introduction - Establishing the development environment - Android Architecture - Activities and views - Interacting with UI - Persisting data using SQLite - Packaging and deployment - Interaction with server side applications - Using Google Maps – GPS and Wifi Integration with social media applications

UNIT – V   TECHNOLOGY II IOS   [9]

Introduction to Objective C - IOS features - UI implementation - Touch frameworks - Data persistence using Core Data and SQLite - Location aware applications using Core Location and Map Kit - Integrating calendar and address book with social media application – Using Wifi – iPhone marketplace

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Discuss the requirements for mobile applications
CO2: Explain the challenges in mobile application design and development
CO3: Develop design for mobile applications for specific requirements
CO4: Examine the design using Android SDK
CO5: Deploy mobile applications in Android and iPhone marketplace for distribution

Text Books :

1   Jeff McWherter and Scott Gowell, Professional Mobile Application Development, Wrox, 2012.
2   Charlie Collins, Michael Galpin and Matthias Kappler, Android in Practice, Dream Tech, 2012

Reference Books :

1   James Dovey and Ash Furrow, Beginning Objective C, Apress, 2012
2   David Mark, J ack Nutting, Jeff LaMarche and Frederic Olsson, Beginning IOS 6 Development: exploring the iOS SDK, Apress, 2013.
3   Reto Meier, Professional Android 4 Application Development, Wrox Publications, John Wiley, 2012.
4   http://developer.android.com/develop/index.html

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　　　**R 2018**
SEMESTER – VII

		L	T	P	C
18IT712	**COMPUTER GRAPHICS AND VISUALIZATION**	3	1	0	4

Prerequisite: – *No prerequisite needed for enrolling into the course*
Objective(s):

* *To understand fundamental concepts in graphics*
* *To be familiar with two dimensional geometrical concepts*
* *To be aware of current trends in 3D geometric and modeling techniques*
* *To understand the basic concepts in Animation*
* *To be aware about Visualization Principles and Algorithms*

UNIT – I　　　OUTPUT PRIMITIVES　　　　　　　　　　　　　　　　　**[12]**

Points and Lines - Line - Drawing algorithms - Loading frame Buffer - Line function - Circle - Generating algorithms - Ellipse generating algorithm - Examples - Applications - Attributes − Two Dimensional geometric transformations - Two Dimensional clipping and viewing – Input techniques

UNIT – II　　　TWO DIMENSIONAL CONCEPTS　　　　　　　　　　　**[12]**

Basic Transformations - Matrix Representations - Composite Transformations - Other Transformations. 2D Viewing: The Viewing - Viewing Co-ordinate Reference Frame - Window to Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations

UNIT – III　　　THREE DIMENSIONAL CONCEPTS　　　　　　　　　**[12]**

Three Dimensional object representations - Three Dimensional geometric and modeling transformations − Three Dimensional viewing − Hidden surface elimination - Color models - Virtual reality

UNIT – IV　　　COMPUTER ANIMATION　　　　　　　　　　　　　**[12]**

Design of Animation Sequences - General Computer Animation Functions - Raster Animations - Computer Animation Languages – Key Frame Systems – Motion Specifications

UNIT – V　　　VISUALIZATION　　　　　　　　　　　　　　　　**[12]**

Visualization Principles: Methods - Data Aspects and Transformations - Time Tested Principles for Good Visual Plots - Tone Mapping - Matters of Perception - Visualizing Multidimensional Data - Color in Graphics and Visualization - Scientific Visualization Algorithms: Scalar and Vector Data Visualization

Total (L: 45 T: 15) = 60 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Analyze a wide range of graphic design problems

CO2: Demonstrate the concepts of two dimensional geometric transformations and Clipping operations

CO3: Comprehend the concepts related to three dimensional object representations

CO4: Illustrate the Animation languages

CO5: Discuss Visualization Principles and its Algorithms

Text Books :

1　Donald Hearn and M. Pauline Baker, Computer Graphics C Version, Pearson Education, 2nd Edition, 2003
2　T. Theoharis, G. Papaioannou, N. Platis and N. M. Patrikalakis, Graphics & Visualization Principles and Algorithms, CRC Press , 2008

Reference Books :

1　Amarendra N Sinha, Arun D Udai, Computer Graphics, Tata McGraw Hill Education,2008
2　Ranjan Parekh ,Principles of Multimedia , Tata McGraw Hill Education , 2013
3　Chopra Rajiv ,Computer Graphics with An Introduction to Multimedia, 4th Edition ,S Chand & Company Limited,2017
4　Computer Graphics : https://nptel.ac.in/courses/106/106/106106090/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**
<u>**SEMESTER – VII**</u>

		L	T	P	C
18IT713	**CRYPTOGRAPHY AND NETWORK SECURITY**	3	0	0	3

Prerequisite: Computer Networks

Objective(s):

- *To understand OSI security architecture and classical encryption techniques*
- *To understand fundamental concepts of finite fields and number theory*
- *To acquire knowledge on encryption techniques, design principles and modes of operation*
- *To describe the principles of public key cryptosystems, hash functions and digital signature*
- *To provide basic concept about system security and attacks*

UNIT – I   INTRODUCTION   [9]

The OSI security architecture - Services, Mechanisms and attacks - Network security model - Classical Encryption Techniques: Symmetric Cipher Model - Substitution Techniques - Transposition Techniques. Number Theory: Polynomial Arithmetic - Prime numbers - Fermat"s and Euler"s theorem - Testing for Primality - The Chinese Remainder Theorem

UNIT – II   BLOCK CIPHERS   [9]

Block cipher principles - Data Encryption Standard - Advanced Encryption Standard (AES) - Block cipher modes of operation – Triple DES – Blowfish – RC5 Algorithm.

UNIT – III   PUBLIC KEY CRYPTOGRAPHY   [9]

Principles of public key cryptosystems - The RSA algorithm - Key management - Diffie Hellman Key exchange - Elliptic curve arithmetic – Elliptic curve cryptography

UNIT – IV   HASH FUNCTIONS AND DIGITAL SIGNATURES   [9]

Hash functions - Hash Algorithms: MD5 - Secure Hash Algorithm - Authentication functions - Message authentication codes - Digital Signatures: Authentication protocols - Digital signature standard

UNIT – V   SECURITY PRACTICE AND SYSTEM SECURITY   [9]

Authentication applications - Kerberos - X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls - Firewall related terminology -Types of Firewalls - Firewall designs - SET for E- Commerce Transactions. Intruder - Intrusion detection system - Virus and related threats - Countermeasures - Firewalls design principles

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Compare various Cryptographic Techniques

CO2: Elaborate the concept of various Block Ciphers

CO3: Explain various Public key cryptography algorithms

CO4: Make use of data transmission security for Authentication

CO5: Evaluation of security among the systems by making the firewall and security standards efficient

Text Books :

1   William Stallings, Cryptography and Network Security, Pearson Education,New Delhi, Sixth Edition,2013

2   Behrouz A Forouzan, Cryptography and Network Security, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2007

Reference Books :

1   AtulKahate,Cryptography and Network Security, McGraw Hill Education India Pvt Ltd, Second Edition, 2009

2   Charlie Kaufman, Radia Perlman, Mike Speciner, Network Security, Prentice Hall of India, 2002

3   CharlesPfleeger, Security in computing, Prentice Hall of India, Fourth Edition, 2006

4   UlysessBlack, Internet Security Protocols, Pearson Education Asia, 2000

5   Cryptography and Network Security :https://nptel.ac.in/courses/106/105/106105162/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

<u>SEMESTER – VII</u>

		L	T	P	C
18IT721	**MOBILE APPLICATION DEVELOPMENT LABORATORY**	0	0	3	1

Prerequisite: Object Oriented Programming Laboratory

Objective(s):

- To recognize the components and structure of mobile application development frameworks for Android and windows OS based mobiles
- To know how to work with various mobile application development frameworks
- To learn about graphical primitives and intents
- To learn the basic and important design concepts and issues of development of mobile applications
- To understand the capabilities and limitations of mobile devices

List of Experiments:

1. Create an Android application that shows Hello + name of the user and run it on an emulator. (b) Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user clicks the OK button.

2. Develop an application that uses Layout Managers and event listeners.

3. Write an application that draws basic graphical primitives on the screen.

4. Develop an application that makes use of Notification Manager

5. Develop an application that uses a menu with 3 options for dialing a number, opening a website and to send an SMS. On selecting an option, the appropriate action should be invoked using intents.

6. Develop a native application that uses GPS location information

7. Create a user registration application that stores the user details in a database table

8. Implement an application that creates an alert upon receiving a message

9. Create a database and a user table where the details of login names and passwords are stored. Insert some names and passwords initially. Now the login details entered by the user should be verified with the database and an appropriate dialog should be shown to the user

10. Develop a mobile application to send an email

Total = 45 Periods

Course Outcomes: Upon Completion of this course, the students will be able to
CO1: Create mobile application using GUI and Layouts
CO2: Develop mobile application using Event Listener
CO3: Build mobile application using Databases
CO4: Construct mobile application using GPS
CO5: Analyze and discover own mobile app for simple needs

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VII**</u>

		L	**T**	**P**	**C**
18IT722	**COMPUTER GRAPHICS LABORATORY**	**0**	**0**	**3**	**1**

Prerequisite: *Programming in C & C++*

Objective(s)*:*

- *To create basic shapes used in computer graphics*
- *To implement different transformation techniques used in computer graphics*
- *To be aware of various clipping techniques*
- *To learn about various compression techniques*
- *To be aware of using image editing software*

List of Experiments:

1. To implement Bresenham‴s algorithms for line, circle and ellipse drawing
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing
3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping
4. To perform 3D Transformations such as translation, rotation and scaling
5. To implement polygon clipping algorithm
6. To implement Liang, Bersky line clipping algorithm
7. To visualize projections of 3D images and Hidden Surface Elimination
8. To convert between color models
9. To implement text compression algorithm
10. To implement image compression algorithm
11. To perform basic operations on image using Photoshop

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Develop models for computer graphics and animation applications

CO2: Apply 2D and 3D transformation techniques to various graphics models

CO3: Analyze and Handle various animation and image editing tools

CO4: Develop multimedia compression algorithm

CO5: Illustrate the basic operations in animation

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER –VIII

18IT821	**PROJECT WORK**	L	T	P	C
		0	0	12	6

Prerequisite: *Core IT courses*

Objectives:

- To equip the students to understand the Problem Definition
- To practice the appropriate strategies and methodologies in SDLC for the real world situations / problems
- To Practice the students for utilizing the modern tools and components
- To provide the students with opportunities to innovate solutions to real-world problems
- To be able to write report effectively

Guidelines:

- Student group comprises of three to four members on a project title under the guidance of a faculty is approved by the head of the department

- The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department

- Comprehensive project report is submitted after completing the work to the satisfaction of the supervisor.

- The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Identify problems and provide solutions for the real world problems
CO2: Discover appropriate strategies and methodologies for the problem
CO3: Utilize modern tools and techniques to obtain the solution for the technical project
CO4: Test and validate through prototype and measure the cost analysis
CO5: Communicate and report effectively project related activities and findings

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**
SEMESTER - V

			L	T	P	C
18IT561	**OBJECT ORIENTED ANALYSIS AND DESIGN**		3	0	0	3

(ELECTIVE)

Prerequisite: Basic Knowledge on Programming and Data Structures
Objective(s):

- *To understand the fundamentals of object modeling*
- *To understand and differentiate Unified Process from other approaches*
- *To design with static and UML diagrams and implementation diagrams*
- *To improve the software design with design patterns*
- *To test the software against its requirements specification*

UNIT – I   UNIFIED PROCESS AND USE CASE DIAGRAMS   [9]

Introduction to OOAD with OO Basics - Unified Process - UML diagrams - Use Case - Case study - the Next Gen POS system - Inception - Use case Modeling - Relating Use cases - include - extend and generalization - When to use Use cases

UNIT – II   STATIC UML DIAGRAMS   [9]

Class Diagram - Elaboration - Domain Model - Finding conceptual classes and description classes - Associations - Attributes - Domain model refinement - Finding conceptual class Hierarchies - Aggregation and Composition - Relationship between sequence diagrams and use cases - When to use Class Diagrams

UNIT – III   DYNAMIC AND IMPLEMENTATION UML DIAGRAMS   [9]

Dynamic Diagrams - UML interaction diagrams - System sequence diagram - Collaboration diagram - When to use Communication Diagrams - State machine diagram and Modeling - When to use State Diagrams - Activity diagram - When to use activity diagrams Implementation Diagrams - UML package diagram - When to use package diagrams - Component and Deployment Diagrams - When to use Component and Deployment diagrams

UNIT – IV   DESIGN PATTERNS   [9]

GRASP: Designing objects with responsibilities - Creator - Information expert - Low Coupling - High Cohesion - Controller Design Patterns - Creational - Factory method - Structural - Bridge - Adapter - behavioral - Strategy - observer – Applying GoF design patterns – Mapping design to code

UNIT – V   TESTING   [9]

Object Oriented Methodologies - Software Quality Assurance - Impact of object orientation on Testing - Develop Test Cases and Test Plans

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Discover the knowledge of software design with UML diagrams
CO2: Design software applications using OO concepts
CO3: Identify various scenarios based on software requirements
CO4: Translate UML based software design into pattern based design using design patterns
CO5: Explain the various testing methodologies for OO software

Text Books :

1 Hopcroft J.E., Motwani R. and Ullman J.D, Introduction to Automata Theory, Languages and Computations, Third Edition, Pearson Education, 2015

2 John C Martin, Introduction to Languages and the Theory of Computation, Tata McGraw Hill Publishing Company, New Delhi, Third Edition, 2014

Reference Books :

1 Mishra K L P and Chandrasekaran N, Theory of Computer Science , Automata, Languages and Computation, Third Edition, Prentice Hall of India, 2014

2 Harry R Lewis and Christos H Papadimitriou, Elements of the Theory of Computation, Second Edition, Prentice Hall of India, Pearson Education, New Delhi, 2013

3 Peter Linz, An Introduction to Formal Language and Automata, Third Edition, Narosa Publishers, New Delhi, 2012

4 Kamala Krithivasan and Rama. R, Introduction to Formal Languages, Automata Theory and Computation, Pearson Education 2012

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER - V

		L	T	P	C
18IT562	**ARTIFICIAL INTELLIGENCE**	**3**	**0**	**0**	**3**
	(ELECTIVE)				

Prerequisite: *No prerequisite needed for enrolling into the course*

Objective(s):

- *To learn the basics of designing intelligent agents*
- *To solve general purpose problems*
- *To learn logical reasoning of intelligence*
- *To understand the planning issues with respect real world*
- *To learn from experiences and communicate with other Agents*

UNIT – I   FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE   [9]

Intelligent Agents - Agents and environments - Good behavior - The nature of environments - Structure of agents – Problem Solving – Problem solving agents - Example problems - Searching for Solutions - Uniformed search strategies - Avoiding Repeated States - Searching with partial information

UNIT – II   SEARCHING TECHNIQUES   [9]

Informed search and exploration - Informed search strategies - Heuristic Function - Local Search Algorithms and optimistic problems - Constraint Satisfaction Problems (CSP) - Backtracking search - Structure of problems - Adversarial Search - Games - Optimal decisions in games - Alpha , Beta Pruning

UNIT – III   LOGICAL REASONING   [9]

First order logic - Representation Revisited - Syntax and semantics for first order logic - Using first order logic - Knowledge Engineering in first order logic - Inference in First Order Logic - Prepositional versus first order logic - Unification and Lifting - Forward Chaining - Backward Chaining - Resolution - Knowledge representation

UNIT – IV   PLANNING   [9]

The Planning Problem - Planning with state space search - Partial order planning - Planning graphs - planning and acting in the real world :Time schedules and resources - Planning and acting in non deterministic Domain - Conditional Planning - Execution monitoring and preplanning - continuous planning and multi agent planning

UNIT-V   LEARNING AND COMMUNICATIONS   [9]

Learning from observation - Inductive learning - Decision trees - Explanation based learning Communication - Communication as action - Formal grammar for a fragment of English - Syntactic analysis - Augmented grammars - Semantic interpretation - Ambiguity and disambiguation - Discourse understanding - Grammar induction

Total = 45 Periods

Course Outcomes: *On completion of this course- the student will be able to*

CO1: Interpret knowledge about intelligent agent
CO2: Outline the optimistic problems of CSP
CO3: Discuss about First order logic and syntax, semantics
CO4: Explain about planning problems
CO5: Summarize the basic concepts of learning and communication

Text Books :

1 S. Russel and P. Norvig, Artificial Intelligence ,A Modern Approach, Third Edition, Pearson Education, 2016
2 Michael Huth and Mark Ryan, Logic in Computer Science: Modelling and Reasoning about Systems, Cambridge University Press, Second edition, 2014

Reference Books :

1 Elaine Rich and Kevin Knight and Shivashankar B.Nair, Artificial Intelligence, 2nd Edition, Tata McGraw,Hill, 2009
2 David Poole, Alan Mackworth, Randy Goebel, Computational Intelligence : a logical approach, Oxford University Press, 2004
3 G. Luger, Artificial Intelligence: Structures and Strategies for complex problem solving, Fourth Edition, Pearson Education, 2012
4 Nils J. Nilsson, Artificial Intelligence: A new Synthesis, Harcourt Asia Pvt. Ltd., 2012

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　**R 2018**

SEMESTER - V

18IT563	MOBILE COMPUTING	L	T	P	C
	(Common to AU & IT)	3	0	0	3
	(ELECTIVE)				

Prerequisite: Computer Networks.

Objective(s):
- *To understand the basic concepts of mobile computing*
- *To be familiar with the network protocol stack*
- *To learn the basics of mobile telecommunication system*
- *To be exposed of Ad-Hoc networks*
- *To know about different mobile platforms and application development.*

UNIT – I　　INTRODUCTION　　　　　　　　　　　　　　　　　　[9]

Mobile Computing - Mobile Computing vs. Wireless Networking - Mobile Computing Applications - Characteristics of Mobile computing - Structure of Mobile Computing Application - MAC Protocols - Wireless MAC Issues - Fixed Assignment Schemes - Random Assignment Schemes - Reservation Based Schemes

UNIT – II　　MOBILE TELECOMMUNICATION SYSTEM　　　　　　　[9]

Global System for Mobile Communication (GSM) - General Packet Radio Service (GPRS) - Universal Mobile Telecommunication System (UMTS)

UNIT – III　　MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER　　[9]

Overview of Mobile IP - Features of Mobile IP - Key Mechanism in Mobile IP - Route Optimization - Overview of TCP/IP - Architecture of TCP/IP - Adaptation of TCP Window - Improvement in TCP Performance

UNIT – IV　　MOBILE AD-HOC NETWORKS　　　　　　　　　　　[9]

Ad-Hoc Basic Concepts - Characteristics - Applications - Design Issues - Routing - Essential of Traditional Routing Protocols - Popular Routing Protocols - Vehicular Ad Hoc networks (VANET) - MANET vs. VANET - Security

UNIT – V　　MOBILE PLATFORMS AND APPLICATIONS　　　　　　[9]

Mobile Device Operating Systems - Special Constrains & Requirements - Commercial Mobile Operating Systems - Software Development Kit: iOS - Android - BlackBerry - Windows Phone - MCommerce - Structure - Pros & Cons - Mobile Payment System – Security Issues

Total = 45Periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Extend the knowledge on basic concept of the mobile networks
CO2: Discuss Mobile IP and TCP
CO3: Explain Mobile Telecommunication System
CO4: Summarize Mobile Ad-hoc Networks
CO5: Outline the concept of various Mobile platform and applications

Text Books :

1　Prasant Kumar Pattnaik, Rajib Mal, Fundamentals of Mobile Computing, PHI Learning Pvt. Ltd, New Delhi ,2016

2　Jochen H. Schller, Mobile Communications, Second Edition, Pearson Education, New Delhi, 2007

Reference Books :

1　Dharma Prakash Agarval, Qing and An Zeng, Introduction to Wireless and Mobile systems, Thomson Asia Pvt Ltd, 2005

2　Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, Principles of Mobile Computing, Springer, 2003

3　William.C.Y.Lee, Mobile Cellular Telecommunications, Analog and Digital Systems, Second Edition,Tata Mc Graw Hill Edition,2006

4　Android Developers : http://developer.android.com/index.html

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

18IT564	UNIX INTERNALS	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite: Operating System

Objective(s):
- *To get thorough understanding of the kernel*
- *To understand the file organization and management*
- *To know the various system calls*
- *To have knowledge of process architecture, process control & scheduling*
- *To gain the knowledge of memory management*

UNIT – I   GENERAL OVERVIEW OF THE SYSTEM   [9]

History - System structure - User   perspective - Operating system services - Assumptions about hardware - Introduction to the Kernel - Architecture of the UNIX operating system - Introduction to system concepts - Kernel data structures - System administration - Summary and Preview

UNIT - –II   BUFFER CACHE   [9]

Buffer headers - Structure of the buffer pool - Advantages and disadvantages of the buffer cache - Internal representation of files: Inodes - Structure of a regular file - Directories - Conversion of a path name to an Inode - Super block - Other file types

UNIT – III   SYSTEM CALLS FOR FILE SYSTEM   [9]

Open - Read, Write File and record locking - Adjusting the position of file I/O - LSEEK - Close - File creation - Creation of special files – Pipes – Dup – Mounting and unmounting file systems

UNIT – IV   THE STRUCTURE OF PROCESSES   [9]

Process states and transitions - Layout of system memory - The context of a process - Saving the context of a process - Process Control: Process creation - Signals - Process termination - Awaiting process termination - Invoking other programs - The shell - System boot and the INIT process

UNIT – V   PROCESS SCHEDULING AND MEMORY MANAGEMENT POLICIES   [9]

Process Scheduling - Memory Management Policies: Swapping - Demand paging - A hybrid system with swapping and demand paging - The I/O Subsystem: Driver Interfaces - Disk Drivers - Terminal Drivers

Total = 45Periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Analyze about the general overview of the system
CO2: Extend the knowledge on kernel
CO3: Explain about I/O & files
CO4: Interpret knowledge on process control
CO5: Infer the knowledge on scheduling and memory management policies in UNIX

Text Books :

1   Maurice J. Bach, The Design of the Unix Operating System, Prentice Hall of India, 2014
2   Uresh Vahalia, UNIX Internals: The New Frontiers, Prentice Hall of India, 2016

Reference Books :

1   Vahalia, Unix Internals: The New Frontiers, Pearson Education Inc, 2013
2   John Lion, Lion's Commentary on UNIX, 6th edition, Peer to Peer Communications, 2014
3   Daniel P. Bovet & Marco Cesati, Understanding the Linux Kernel, O"REILLY, Shroff Publishers & Distributors Pvt. Ltd, 2012
4   M. Beck et al, Linux Kernel Programming, Pearson Education Asia, 2012

SEMESTER - V

18IT565	AGILE METHODOLOGIES	L	T	P	C
		3	0	0	3

(ELECTIVE)

P*rerequisite:* Exposure to any object oriented programming language such as Java, C#.

Objectives

- *To know agile fundamentals*
- *To understand about scrum framework*
- *To perform agile testing*
- *To get knowledge on agile software design & programming*
- *To know* industry trends.

UNIT – I   FUNDAMENTALS OF AGILE   [9]

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 - Test Driven Development - Continuous Integration - Refactoring - Pair rogramming – Simple Design – User Stories – Agile Testing – Agile Tools

UNIT – II   AGILE SCRUM FRAMEWORK   [9]

Introduction to Scrum - Project phases - Agile Estimation - Planning game - Product backlog - Sprint backlog - Iteration planning - User story definition - Characteristics and content of user stories - Acceptance tests and Verifying stories - Project velocity - Burn down chart - Sprint planning and retrospective - Daily scrum - Scrum roles - Product Owner - Scrum Master - Scrum Team - Scrum case study - Tools for Agile project management

UNIT – III   AGILE TESTING   [9]

The Agile lifecycle and its impact on testing - Test Driven Development (TDD) - Unit framework and tools for TDD - Testing user stories - Acceptance tests and scenarios - Planning and managing testing cycle - Exploratory testing - Risk based testing - Regression tests - Test Automation - Tools to support the Agile tester

UNIT – IV   AGILE SOFTWARE DESIGN AND DEVELOPMENT   [9]

Agile design practices - Role of design Principles including Single Responsibility Principle - Open Closed Principle - Liskov Substitution Principle - Interface Segregation Principles - Dependency Inversion Principle in Agile Design - Need and significance of Refactoring - Refactoring Techniques - Continuous Integration - Automated build tools - Version control

UNIT – V   INDUSTRY TRENDS   [9]

Market scenario and adoption of Agile - Agile ALM - Roles in an Agile project - Agile applicability - Agile in Distributed teams - Business benefits - Challenges in Agile - Risks and Mitigation - Agile projects on Cloud - Balancing Agility with Discipline - Agile rapid development technologies

Total = 45 Periods

Course Outcomes: *On completion of this course, the student will be able to*

CO1: Explain about the background and driving forces for taking an Agile approach to software development

CO2: Analyze drive development concept with unit tests using Test Driven Development

CO3: Explain design principles and refactoring to achieve Agility

CO4: Discuss about automated build tools and version control of Agile Software development

CO5:Summarize testing activities within an Agile project

Text Books :

1   Ken Schawber & Mike Beedle , Agile Software Development with Scrum, Pearson Education International, Second Edition,2017

2   Lisa Crispin & Janet Gregory, Agile Testing: A Practical Guide for Testers and Agile Teams, Pearson Education, Inc. 2009

Reference Books :

1   Robert C. Martin, Agile Software Development, Principles, Patterns and Practices, Pearson, 1st edition , 2012

2   Alistair Cockburn, Agile Software Development: The Cooperative Game, Addison,Wesley Professional; 2 edition, 2006

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　**R 2018**

<u>**SEMESTER - V**</u>

		L	T	P	C
18IT566	**ENTERPRISE RESOURCE AND PLANNING**	3	0	0	3
	(ELECTIVE)				

P*rerequisite: No prerequstie*

Objective(s):

- *To know enterprise resource planning*
- *To get knowledge on modeling and integration of ERP*
- *To understand architecture of ERP*
- *To know SAP and Oracle APPs*
- *To be familiar with supply chain management*

UNIT – I   INTRODUCTION TO ENTERPRISE RESOURCE PLANNING   [9]

Introduction of the term Business Process Reengineering(BPR) - BPR Methodology - Current BPR Tools - Introduction to material requirement planning (MRP) - Definition of Enterprise Resource Planning (ERP) - Evolution of ERP - Characteristics - Features - Components and needs of ERP; ERP Vendors - Benefits & Limitations of ERP Packages

UNIT – II   ENTERPRISE MODELING AND INTEGRATION OF ERP   [9]

Need to focus on Enterprise Integration/ERP - Information mapping - Role of common shared Enterprise database - System Integration - Logical vs. Physical System Integration - Benefits & limitations of System Integration - ERP"s Role in Logical and Physical Integration

UNIT – III   ERP ARCHITECTURE AND IMPLEMENTATION METHODOLOGY OF ERP   [9]

Generic Model of ERP system - Core Modules functionality - Types of ERP architecture - Client Server Architecture - Web based Architecture- Service Oriented Architecture (SOA) - Difficulty in selecting ERP - Approach to ERP selection - Request for Proposal approach - Proof of Concept approach - General Implementation Methodology of ERP - Vanilla Implementation - Evaluation Criteria of ERP packages – Project Implementation Team Structure

UNIT – IV   INTRODUCTION TO SAP - ORACLE APPS   [9]

SAP- Integrated SAP Model - SAP Architecture - SAP R/3 System & mySAP - SAP Modules - Oracle Apps - Oracle AIM Methodology - Oracle Fusion Modules - A Comparative assessment of ERP Packages

UNIT – V   ERP FOR SUPPLY CHAIN MANAGEMENT   [9]

Definition of Supply Chain Management (SCM) - Supply Chain Council"s SCOR Model - Stevens Model of Supply Chain Management - Aims of SCM - SCM Key Drivers - Collaborative Design & Product Development - Benefits of SCM - ERP Vs SCM - Key SCM Vendors

Total = 45 Periods

Course Outcomes: *On completion of this course, the student will be able to*

CO1: Classify different processes of the organization and relationship among all processes
CO2: Examine systematically the planning mechanisms in an enterprise- and identify all components in an ERP system
CO3: Discuss the Generic Model of ERP and General ERP Implementation Methodology
CO4: Apply the concepts of BPR- SCM and CRM
CO5: Demonstrate knowledge of SAP and Oracle Apps

Text Books :

1　Luvai F. Motiwalla, Jeff Thompson, Enterprise Systems For Management , Pearson Education, 2nd Ed. ISBN-10: 0132145766 | ISBN-13: 978- 0132145763 2, 2011

2　Ravi Shankar, S.Jaiswal, Enterprise Resource Planning, Galgotia Publication Pvt. Ltd., ISBN 81-203-0417-9, 2010

Reference Books :

1　Paul Greenberg, CRM at the speed of Light : Social CRM strategies- tools and techniques for engaging your customers ,4th edition, McGraw Hill ,2009

2　Chuck Munson, Supply Chain Management Casebook : The Comprehensive Coverage and Best Practices in SCM, Pearson FT Press, ISBN-13: 978-0- 13-336723-2,2013

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

		L	T	P	C
18IT661	**BIO INFORMATICS** **(ELECTIVE)**	3	0	0	3

Prerequisite: No prerequisite needed for enrolling into the course
Objective(s):

- *To be exposed to the need for Bioinformatics technologies*
- *To be aware of DWDM in bioinformatics*
- *To be familiar with the modelling techniques*
- *To learn microarray analysis*
- *To be exposed to Pattern Matching and Visualization*

UNIT – I   INTRODUCTION   [9]

Need for Bioinformatics Technologies - Bioinformatics Technologies: Structural Bioinformatics - Data Format and Processing - Secondary Resources and Applications - Structural Bioinformatics - Biological Data Integration System

UNIT – II   DATAWAREHOUSING AND DATAMINING IN BIOINFORMATICS   [9]

Bioinformatics Data - Data Warehousing Architecture - Data Quality - Biomedical Data Analysis - DNA Data Analysis - Protein Data Analysis - Machine Learning - Neural Network Architecture and applications in bioinformatics

UNIT – III   MODELING FOR BIOINFORMATICS   [9]

Hidden Markov Modelling for Biological Data Analysis - Sequence Identification - Sequence Classification - Multiple Alignment Generation - Comparative Modelling - Protein Modelling - Genomic Modelling - Probabilistic Modelling - Bayesian Networks - Boolean Networks - Molecular Modelling - Computer Programs for Molecular Modelling

UNIT – IV   PATTERN MATCHING AND VISUALIZATION   [9]

Gene Regulation - Motif Recognition - Motif Detection - Strategies for Motif Detection - Visualization - Fractal Analysis - DNA Walk Models - One Dimension - Two Dimension - Higher Dimension - Game representation of Biological Sequences - DNA , Protein, Amino Acid Sequences

UNIT – V   MICROARRAY ANALYSIS   [9]

Microarray Technology for Genome Expression Study - Image Analysis for Data Extraction - Pre-Processing - Segmentation - Gridding - Spot Extraction - Normalization, Filtering - Cluster Analysis - Gene Network Analysis - Compared Evaluation of Scientific Data Management Systems - Cost Matrix - Evaluation Model - Benchmark - Tradeoffs

Total = 45 Periods

Course Outcomes: On completion of the course, the student will be able to

CO1: Develop models for biological data.
CO2: Translate pattern matching techniques to bioinformatics data and protein data
CO3: Apply micro array technology for genomic expression study.
CO4: Explain about pattern recognition and visualization
CO5: Discuss microarray analysis

Text Book :

1   Yi-Ping Phoebe Chen (Ed), Bioinformatics Technologies, First Indian Reprint, Springer Verlag, 2014

Reference Books :

1   Bryan Bergeron, Bio Informatics Computing, Second Edition, Pearson Education, 2013
2   Arthur M Lesk, Introduction to Bioinformatics, Second Edition, Oxford University Press, 2012
3   Ronald Brachman, Hector Levesque , Knowledge Representation and Reasoning ‖, The Morgan Kaufmann Series in Artificial Intelligence 2012
4   Timothy J. Ross, Fuzzy Logic with Engineering Applications, Third Edition, John Wiley & Sons, 2010

K.S.R. COLLEGE OF ENGINEERING (Autonomous) **R 2018**

<u>SEMESTER – VI</u>

18IT662

CLOUD COMPUTING (Common to EC & IT) (ELECTIVE)	L	T	P	C
	3	0	0	3

Prerequisite: Operating Systems, Computer Networks
Objective(s):

- *To understand how Grid computing helps in solving large scale scientific problems*
- *To gain knowledge on the concept of virtualization that is fundamental to cloud computing*
- *To learn programming skill the grid and the cloud*
- *To understand the security issues in the grid and the cloud environment*
- *To understand various security measures in cloud and grid environment*

UNIT – I   INTRODUCTION   [9]

Evolution of Distributed computing: Scalable computing over the Internet - Technologies for network based systems - Good modeling - Clusters of cooperative computers - Grid computing Infrastructures - Cloud Computing - Service Oriented Architecture-Introduction to Grid Architecture and Standards -Elements of Grid - Overview of Grid Architecture

UNIT – II   GRID SERVICES   [9]

Introduction to Open Grid Services Architecture (OGSA) - Motivation - Functionality Requirements - Practical & Detailed view of OGSA/OGSI - Data intensive grid service models - OGSA services

UNIT – III   VIRTUALIZATION   [9]

Cloud deployment models: public, private, hybrid, community - Categories of Cloud Computing: Everything as a service: Infrastructure, platform, software - Pros and Cons of cloud computing - Implementation levels of virtualization - Virtualization structure - Virtualization of CPU - Memory and I/O devices - Virtual clusters and Resource Management - Virtualization for Data Center Automation

UNIT – IV   PROGRAMMING MODEL   [9]

Open Source Grid Middleware packages - Globus Toolkit (GT4) Architecture - Configuration - Usage of Globus - Main components and Programming model - Introduction to Hadoop Framework - Map Reduce - Input splitting - Map and reduce functions - Specifying input and output parameters - Configuring and running a job - Design of Hadoop file system - HDFS concepts - Command line and java interface - Dataflow of File read & File write

UNIT -- V   SECURITY   [9]

Trust models for Grid security environment - Authentication and Authorization methods - Grid security infrastructure - Cloud Infrastructure security: network - Host and application level - Aspects of data security - Provider data and its security - Identity and access management architecture - IAM practices in the cloud - SaaS - PaaS - IaaS availability in the cloud - Key privacy issues in the cloud

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
CO1:Demonstrate the grid computing techniques to solve large scale scientific problems
CO2: Apply the grid services in various computing environment.
CO3: Summarize the concept of virtualization
CO4: Make use of the grid and cloud tool kits
CO5: Apply the security models in the grid and the cloud environment

Text Book :
1   Kai Hwang, Geoffery C. Fox and Jack J. Dongarra, Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet, First Edition, Morgan Kaufman Publisher, an Imprint of Elsevier, 2012
2   Rittinghouse, John W., and James F. Ransome, Cloud Computing: Implementation, Management and Security, CRC Press, 2017.

Reference Books :
1   Jason Venner, Pro Hadoop- Build Scalable, Distributed Applications in the Cloud, A Press, 2012
2   Tom White, Hadoop The Definitive Guide, First Edition, O"Reilly, 2012
3   Ian Foster, Carl Kesselman, The Grid: Blueprint for a New Computing Infrastructure, 2nd Edition, Morgan Kaufmann
4   Frederic Magoules and Jie Pan, Introduction to Grid Computing, CRC Press, 2009

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　**R 2018**

<u>**SEMESTER – VI**</u>

| 18IT663 | HUMAN COMPUTER INTERACTION
(ELECTIVE) | L
3 | T
0 | P
0 | C
3 |

Prerequisite: No prerequisite needed for enrolling into the course
Objective(s):

- *To learn the foundations of Human Computer Interaction*
- *To be familiar with the design technologies for individuals and persons with disabilities*
- *To learn about models and theories*
- *To be aware of mobile HCI*
- *To learn the guidelines for user interface*

UNIT – I　　FOUNDATIONS OF HCI　　　　　　　　　　　　　　　　　　[9]

The Human: I/O channels - Memory - Reasoning and problem solving -The computer Devices: Memory - Processing and networks - Interaction Models: Frameworks - Ergonomics - Styles - Elements - Interactivity - Paradigms

UNIT – II　　DESIGN & SOFTWARE PROCESS　　　　　　　　　　　　　[9]

Interactive Design basics - Process - Scenarios - Navigation - Screen design - Iteration and prototyping. HCI in software process - Software life cycle - Usability engineering - Prototyping in practice - Design rationale - Design rules - Principles – Standards - Guidelines - Rules Evaluation Techniques - Universal Design

UNIT – III　　MODELS AND THEORIES　　　　　　　　　　　　　　　　[9]

Cognitive models - Socio Organizational issues and stake holder requirements - Communication and collaboration models – Hypertext, Multimedia and WWW

UNIT – IV　　MOBILE HCI　　　　　　　　　　　　　　　　　　　　　[9]

Mobile Ecosystem: Platforms - Application frameworks - Types of Mobile Applications: Widgets - Applications - Games - Mobile Information Architecture - Mobile 2.0 - Mobile Design: Elements of Mobile Design - Tools

UNIT – V　　WEB INTERFACE DESIGN　　　　　　　　　　　　　　　　[9]

Designing Web Interfaces - Drag & Drop - Direct Selection - Contextual Tools - Overlays - Inlays and Virtual Pages - Process Flow – Case Studies

Total = 45 Periods

Course Outcomes: On completion of the course, the student will be able to
CO1: Design effective dialog for HCI
CO2: Design effective HCI for individuals and persons with disabilities
CO3: Discuss the importance of user feedback
CO4: Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites
CO5: Develop meaningful user interface

Text Books :

1　Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, Human Computer Interaction, 3rd Edition, Pearson Education, 2014
2　Brian Fling, Mobile Design and Development, First Edition , O"Reilly Media Inc., 2012

Reference Books :

1　Bill Scott and Theresa Neil, Designing Web Interfaces, First Edition, O"Reilly, 2009.(UNIT-V)
2　Jakob Nielsen, Usability Engineering, Morgan Kaufmann Publishers, 2010
3　Ben Shneiderman, Designing the user interface: Strategies for effective human computer interaction, 4th Edition, Reading, 2012
4　Special Issue on Brain Control Interfaces, IEEE Transactions on Neural Systems and Rehabilitation Engineering, Vol 14, June 2013

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER – VI

18IT664	SERVICE ORIENTED ARCHITECTURE (ELECTIVE)	L	T	P	C
		3	0	0	3

Prerequisite: No prerequisite needed for enrolling into the course

Objective(s):

- *To understand the basic principles of service orientation*
- *To learn advanced concepts such as service composition, orchestration and Choreography*
- *To be familiar with the web services technology elements for realizing SOA*
- *To learn about service Orientation design*
- *To learn the various web service standards*

UNIT – I   INTRODUCTION   [9]

Characteristics of SOA - Comparing SOA with Client-Server and Distributed architectures - Benefits of SOA - Principles of Service orientation - How components in an SOA interrelate - Principles of service orientation

UNIT – II   WEB SERVICES   [9]

Web services - Service descriptions - Messaging with SOAP - Message exchange Patterns - Coordination -Atomic Transactions - Business activities - Orchestration - Choreography - Service layer abstraction - Application Service Layer - Business Service Layer - Orchestration Service Layer

UNIT – III   SERVICE ORIENTED ANALYSIS   [9]

Service Oriented Analysis - Business centric SOA - Deriving Business Services - Service modeling - Service modeling guidelines

UNIT – IV   SERVICE ORIENTED DESIGN   [9]

Service Oriented Design - WSDL basics - SOAP basics - SOA composition guidelines - Entity centric business service design - Application service design - Task-centric business service design

UNIT – V   BUILDING SOA-BASED APPLICATIONS   [9]

WS-BPEL basics - WS Coordination overview - WS Addressing language basics - WS Reliable Messaging language basics – WSPolicy

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Build applications based on XML

CO2: Develop web services using technology elements

CO3: Build SOA-based applications for intra-enterprise and inter-enterprise applications

CO4: Discuss distributed system

CO5: Discuss web service policy

Text Book:

1   Thomas Erl, Service Oriented Architecture: Concepts, Technology, and Design, Pearson 2nd Edition , 2016

Reference Books :

1   Dan Woods and Thomas Mattern, Enterprise SOA Designing IT for Business Innovation ,O"Reilly, 8th Edition, 2012

2   Sandeep Chatterjee, James Webber, Developing Enterprise Web Services, An Architect"s Guide, Pearson Education, 2005

3   Newcomer, Lomow, Understanding SOA with Web Services, Pearson Education, 2005

4   Thomas Erl, SOA Principles of Service Design, The Prentice Hall, 2005

18IT665	TCP/IP PROTOCOL SUITE	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite: Computer Networks

Objectives:

- *To impart knowledge about the basic concepts of internetworking, internet addressing and forwarding*
- *To understand the concept of TCP/IP Protocol*
- *To learn the routing architecture and the protocols routers use to exchange routing information*
- *To explore the knowledge on socket interface*
- *To discuss application level services available in the internet*

UNIT – I   INTERNETWORKING CONCEPTS   [9]

The TCP/IP internet-Internet Services - Internetworking Concept and Architectural Model - TCP/IP 5 - Layer Reference Model - Protocol layering Principle - IP datagram - IP Forwarding algorithm - Internet addresses: Classful Addressing and Classless Addressing

UNIT – II   TCP/IP PROTOCOL   [9]

ARP message format and Implementation - RARP - The ICMP message formats - User Datagram protocol (UDP) - Reliable Stream Transport Service (TCP): Segment format - Establishing and closing TCP connections - TCP state machine - Silly window syndrome - Karn"s algorithm and Timer Back off

UNIT – III   IP ROUTING   [9]

Routing Architecture: Cores, Peers, and Algorithms - Routing between Peers (BGP): Characteristics - Message header - Functionality and Message types - Routing within an Autonomous System (RIP, OSPF): RIP message format(Ipv4 and Ipv6) – OSPF message format – IGMP

UNIT – IV   SOCKET INTERFACE   [9]

Virtual Private Networks - Network Address Translation - Client-Server Model - The Socket API: Socket operations - Bootstrap and Auto configuration (DHCP) - The Domain Name System: Name Syntax and type - Mapping domain names to addresses - Domain name Resolution - Message format

UNIT – V   NETWORK PROTOCOLS AND FIREWALL DESIGN   [9]

Electronic Mail (SMTP, POP, IMAP, MIME) - World Wide Web HTTP) - Voice and Video Over IP (RTP, RSVP, QoS) - Network Management (SNMP): Message format - Encoded SNMP message - Security in SNMP3 - IP Security - Firewalls

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Identify the basic concepts of internetworking, protocol layering and internet addressing in TCP/IP
CO2: Examine the protocols used to deliver the datagram and report error information
CO3: Analyze the protocols and algorithms used for exchanging routing information
CO4: Evaluate the interaction between client-server using sockets API
CO5: Create an application using SMTP, IMAP, HTTP and RTP protocols

Text Books :

1   Douglas E.Comer, Internetworking with TCP/IP Principles, Protocols and Architecture, 6th Edition Vol.1 PHI, 2014
2   Behrouz A.Forouzan, TCP/IP Protocol Suite, 4th Edition, TMH, 2010

Reference Books :

1   Kevin R.Fall, W. Richard Stevens, TCP/IP Illustrated, Volume 1: The Protocols, 2/E Pearson Education, 2011
2   Dr.Sidnie Feit, TCP/IP , 2nd Edition, TMH, 2008
3   Kevin R. Fall and W. Richard Stevens, TCP/IP Illustrated, Volume 1, Addison-Wesley Professional, 2012
4   http://nptel.ac.in/courses/106105081

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VI**</u>

	INTERNET OF THINGS	**L**	**T**	**P**	**C**

18IT666   **INTERNET OF THINGS**
(Common to IT & ME)   **L   T   P   C**
(ELECTIVE)   **3   0   0   3**

Prerequisite: *Micro Controller and Embedded Systems*
Objectives:

- *To discuss the concept of IOT and explain the various techniques of IOT*
- *To categorize and design the various challenges in domain specific IOT applications*
- *To analyze the basic difference between M2M and IoT and to know the IoT platform design methodology*
- *To learn about developing Internet of Things*
- *To gain knowledge about physical and cloud server*

UNIT – I   INTERNET OF THINGS – INTRODUCTION   [9]

Defining and Characteristics of IoT - Physical Design of IoT - Logical Design of IoT: Functional Blocks - Communication Models - IoT Communication APIs - IoT Enabling Technologies – IoT Levels & Deployment Templates

UNIT – II   CHALLENGES AND DOMAIN SPECIFIC APPLICATIONS IN IOT   [9]

Design Challenges - Development Challenges - Security Challenges - Applications: Home automation - Industry applications – Surveillance applications

UNIT – III   M2M AND SYSTEM MANAGEMENT   [9]

Machine to Machine - Difference between IoT and M2M - SDN and NFV for IoT - IoT System Management - Need for System Management - SNMP - Network Operator Requirements - NETCONF - YANG - IoT Systems Management with NETCONF – YANG

UNIT – IV   DEVELOPING INTERNET OF THINGS   [9]

IoT Design Methodology - IoT Physical Devices and Endpoints - IoT Device - Building blocks - Raspberry Pi - Board - Linux on Raspberry Pi – Raspberry Pi Interfaces - Other IoT devices

UNIT – V   IOT PHYSICAL SERVER AND CLOUD OFFERINGS   [9]

Cloud Storage Models and Communication APIs: WAMP - Xively Cloud for IoT - RESTful web API - Amazon Web Service

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Comprehend the technologies and applications of IoT
CO2: Analyze applications of IoT in real time scenario
CO3: Recall the need for system management
CO4: Develop IoT device using Raspberry Pi Board
CO5: Develop web services to access/control IoT devices

Text Book*:*

[1] Arsdeep Bahga and Vijay Madisetti, Internet of Things - Hands on Approach, University Press India Private Limited, 2016

References :
1 Dieter Uckelmann Et.al, Architecting the Internet of Things, Springer, 2011
2 David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017
3 Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things - Key applications and Protocols, Wiley, 2012
4 Olivier Hersent, Omar Elloumi and David Boswarthick, The Internet of Things: Applications to the Smart Grid and Building Automation, Wiley, 2012
5 http://nptel.ac.in/courses/106105081/

K.S.R. COLLEGE OF ENGINEERING (Autonomous) **R 2018**

<u>**SEMESTER – VI**</u>

18IT667	**WIRELESS COMMUNICATION** **(ELECTIVE)**	**L** 3	**T** 0	**P** 0	**C** 3

Prerequisite: Computer Networks.

Objectives:

- To know the characteristic of wireless channel
- To learn the various cellular architectures
- To understand the concepts behind various digital signalling schemes for fading channels
- To be familiar the various multipath mitigation techniques
- To understand the various multiple antenna systems

UNIT – I   WIRELESS CHANNELS   [9]

Large Scale Path Loss - Path Loss Models: Free Space and Two-Ray Models - Link Budget Design - Small Scale Fading - Parameters Of Mobile Multipath Channels - Time Dispersion Parameters - Coherence Bandwidth - Doppler Spread and Coherence Time - Fading Due To Multipath Time Delay Spread - Flat Fading - Frequency Selective Fading - Fading Due To Doppler Spread - Fast Fading - Slow Fading

UNIT – II   CELLULAR ARCHITECTURE   [9]

Multiple Access Techniques - FDMA - TDMA - CDMA - Capacity Calculations - Cellular Concept - Frequency Reuse - Channel Assignment - Hand Off - Interference & System Capacity - Trunking & Grade Of Service - Coverage and Capacity Improvement

UNIT – III   DIGITAL SIGNALING FOR FADING CHANNELS   [9]

Structure of a Wireless Communication Link - Principles of Offset - QPSK - P/4 - DQPSK - Minimum Shift Keying - Gaussian Minimum Shift Keying - Error performance in fading channels - OFDM principle - Cyclic prefix - Windowing - PAPR

UNIT – IV   MULTIPATH MITIGATION TECHNIQUES   [9]

Equalization - Adaptive equalization - Linear and Non-Linear equalization - Zero forcing and LMS Algorithms - Diversity – Micro and Macro Diversity - Diversity combining techniques - Error probability in fading channels with diversity reception – Rake receiver

UNIT – V   MULTIPLE ANTENNA TECHNIQUES   [9]

MIMO systems - Spatial Multiplexing - System Model - Pre Coding - Beam Forming - Transmitter Diversity - Receiver Diversity - Channel State Information - Capacity In Fading and Non-Fading Channels

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Classify wireless channels
CO2: Design and implement various signalling schemes for fading channels
CO3: Explain about cellular system
CO4: Compare multipath mitigation techniques and analyze their performance
CO5: Design and implement systems with transmit/receive diversity and MIMO systems and analyze their performance

Text Books :

1   Rappaport. T.S., Wireless communications, Second Edition, Pearson Education, 2010

2   Andreas.F. Molisch, Wireless Communications, John Wiley, India, 2010

Reference Books :

1   David Tse and Pramod Viswanath, Fundamentals of Wireless Communication, Cambridge University Press, 2013

2   Upena Dalal, Wireless Communication, Oxford University Press, 2012

3   Van Nee, R. and Ramji Prasad, OFDM for Wireless Multimedia Communications, Artech House, 2010

4   https://nptel.ac.in/courses/117/102/117102062/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VI**</u>

18IT668	**SOFTWARE QUALITY ASSURANCE**	**L**	**T**	**P**	**C**
	(ELECTIVE)	**3**	**0**	**0**	**3**

Prerequisite: *Software Engineering Principles and Practices*

Objective(s):

- To understand the basic tenets of software quality and quality factors
- To be exposed to the Software Quality Assurance (SQA) architecture and the details of SQA components
- To understand of how the SQA components can be integrated into the project life cycle
- To be familiar with the software quality infrastructure
- To be exposed to the management components of software quality

UNIT – I   INTRODUCTION TO SOFTWARE QUALITY & ARCHITECTURE   [9]

Need for Software quality - Quality challenges - Software Quality Assurance (SQA) - Definition and Objectives - Software Quality Factors- McCall"s Quality Model - SQA System and Architecture - Software Project life cycle Components - Pre Project Quality Components – Development and Quality Plans

UNIT – II   SQA COMPONENTS AND PROJECT LIFE CYCLE   [9]

Software Development Methodologies - Quality Assurance Activities in the Development Process - Verification and Validation - Reviews - Software Testing - Software Testing Implementations - Quality Of Software Maintenance - Pre-Maintenance Of Software Quality Components - Quality Assurance Tools - Case Tools For Software Quality - Software Maintenance Quality - Project Management

UNIT – III   SOFTWARE QUALITY INFRASTRUCTURE   [9]

Procedures and Work Instructions - Templates - Checklists - 3S Development - Staff Training and Certification Corrective and Preventive Actions - Configuration Management - Software Change Control - Configuration Management Audit - Documentation Control – Storage and Retrieval

UNIT – IV   SOFTWARE QUALITY MANAGEMENT & METRICS   [9]

Project Process Control - Computerized Tools - Software Quality Metrics - Objectives of Quality Measurement - Process Metrics - Product Metrics - Implementation - Limitations Of Software Metrics - Cost of Software Quality - Classical Quality Cost Model - Extended Model - Application of Cost Model

UNIT– V   STANDARDS, CERTIFICATIONS & ASSESSMENTS   [9]

Quality Management Standards - ISO 9001 and ISO 9000-3 - Capability Maturity Models - CMM And CMMI Assessment Methodologies - Bootstrap Methodology - Spice Project - SQA Project Process Standards - IEEE ST 1012 & 1028 - Organization of Quality Assurance - Department Management Responsibilities - Project Management Responsibilities - SQA Units and other Actors in SQA Systems

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Utilize the concepts in software development life cycle

CO2: Discuss about SQA components and project life cycle

CO3: Demonstrate their capability to adopt quality standards

CO4: Examine the quality of software product

CO5: Apply the concepts in preparing the quality plan & documents

Text Book :

1   Daniel Galin, Software Quality Assurance, Pearson Publication, 2014

Reference Books :

1   Daniel Galin ,Software Quality: Concepts and Practice, March 2018,Wiley Online Library, March 2018
2   Mordechai Ben, Menachem , Software Quality: Producing Practical Consistent Software, International Thompson Computer Press, 1997
3   Claude Y. Laporte and Alain, Software Quality Assurance, Wiler Publisher,2018
4   https://nptel.ac.in/courses/106/101/106101061/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VI**</u>

18IT669	**SOCIAL NETWORK ANALYSIS**	**L**	**T**	**P**	**C**
	(ELECTIVE)	**3**	**0**	**0**	**3**

Prerequisite: *No prerequisite needed for enrolling into the course*

Objective(s):
- *To understand the components of the social network*
- *To model and visualize the social network*
- *To mine the users in the social network*
- *To understand the evolution of the social network*
- *To mine the interest of the user*

UNIT – I   INTRODUCTION   **[9]**

Introduction to Web - Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Statistical Properties of Social Networks - Network analysis - Development of Social Network Analysis - Key concepts and measures in network analysis - Discussion networks - Blogs and online communities - Web-based networks

UNIT – II   MODELING AND VISUALIZATION   **[9]**

Visualizing Online Social Networks - A Taxonomy of Visualizations - Graph Representation - Centrality- Clustering - Node Edge Diagrams - Visualizing Social Networks with Matrix-Based Representations - Node Link Diagrams - Hybrid Representations - Modeling and aggregating social network data - Random Walks and their Applications - Use of Hadoop and Map Reduce - Ontological representation of social individuals and relationships

UNIT – III   MINING COMMUNITIES   **[9]**

Aggregating and reasoning with social network data - Advanced Representations - Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Evaluating Communities - Core Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Node Classification in Social Networks

UNIT – IV   EVOLUTION   **[9]**

Evolution in Social Networks - Framework - Tracing Smoothly Evolving Communities - Models and Algorithms for Social Influence Analysis - Influence Related Statistics - Social Similarity and Influence - Influence Maximization in Viral Marketing - Algorithms and Systems for Expert Location in Social Networks - Expert Location without Graph Constraints - With Score Propagation - Expert Team Formation - Link Prediction in Social Networks - Feature based Link Prediction - Bayesian Probabilistic Models – Probabilistic Relational Models

UNIT– V   TEXT AND OPINION MINING   **[9]**

Text Mining in Social Networks - Opinion extraction - Sentiment classification and clustering - Temporal sentiment analysis - Irony detection in opinion mining - Wish analysis - Product review mining - Review Classification - Tracking sentiments towards topics over time

                                                                                                    Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
CO1 :Make use of the internals components of the social network
CO2: Model and visualize the social network
CO3: Predict the behaviour of the users in the social network
CO4: Identify the possible next outcome of the social network
CO5: Examine the opinion of the user

Text Books :
1 Charu C. Aggarwal,Social Network Data Analytics, Springer; 2011
2 Peter Mika, Social Networks and the Semantic Web, Springer, 1st edition, 2007

Reference Books :
1 Borko Furht,Handbook of Social Network Technologies and Applications, Springer, 1st Edition, 2010
2 Guandong Xu , Yanchun Zhang and Lin Li, Web Mining and Social Networking - Techniques and Applications, Springer, 1st Edition, 2011
3 Giles, Mark Smith, John Yen, Advances in Social Network Mining and Analysis, Springer, 2010
4 Ajith Abraham, Aboul Ella Hassanien, Vaclav Snasel, Computational Social Network Analysis: Trends, Tools and Research Advances, Springer, 2009

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VI**</u>

18IT671	**MACHINE LEARNING TECHNIQUES** **(ELECTIVE)**	**L T P C** **3 0 0 3**	

Prerequisite: *No prerequisite needed for enrolling into the course.*

Objectives:

- *To introduce the basic concepts and techniques of Machine Learning*
- *To learn Supervised and Unsupervised learning techniques*
- *To understand about Dimensionality reduction Techniques*
- *To study the various probability based learning techniques*
- *To learn graphical models of machine learning algorithms*

UNIT – I   FUNDAMENTALS OF LEARNING TECHNIQUES   [9]

Learning - Types of Machine Learning - Supervised Learning - Machine Learning Process - Machine Learning applications - Terminology - Testing Machine Learning Algorithms - Turning Data Into Probabilities - The Brain and the Neuron - Perception – Linear Repeatability - Linear Regression

UNIT – II   LINEAR MODELS   [9]

Multi-layer Perception: Going Forwards - Back Propagation of Error - Multi- layer Perception in Practice - Examples of using the MLP - Deriving Back Propagation - Radial Basis Functions and Splines: Concepts of RBF Network - Interpolations and Basis Functions – Support vector machine

UNIT – III   DIMENSIONALITY REDUCTION AND EVOLUTIONARY MODELS   [9]

Dimensionality Reduction - Linear Discrimination Analysis - Principal Component Analysis - Factor Analysis - Independent Component Analysis - Least Squares Optimization - Basic approach in search - Evolutionary Learning: Genetic algorithms - Genetic Offspring - Genetic Operators - Reinforcement Learning - Overview - Getting Lost Example - Markov Decision Process

UNIT – IV   TREE AND UNSUPERVISED LEARNING   [9]

Learning with Trees: Decision Trees - Constructing Decision Trees - Classification and Regression Trees - Ensemble Learning: Boosting - Bagging - Random forests - Different ways to Combine Classifiers - Unsupervised Learning: K means Algorithms – Vector Quantization – Self Organizing Feature Map

UNIT – V   GRAPHICAL MODELS   [9]

Markov Chain Monte Carlo Methods: Sampling - Proposal Distribution - Markov Chain Monte Carlo - Graphical Models - Bayesian Networks - Markov Random Fields - Hidden Markov Models - Tracking Methods

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Summarize machine learning process and algorithms
CO2: Compare and Contrast between supervised, unsupervised and semi-supervised learning
CO3: Apply the appropriate machine learning strategy for any given problem
CO4: Analyze supervised, unsupervised or semi-supervised learning algorithms for any given problem
CO5: Design systems that use the appropriate graph models of machine learning

Text Books :

1   Stephen Marsland, Machine Learning An Algorithmic Perspective, 2nd Edition, CRC Press Taylor & Francis Group, 2015

2   EthemAlpaydin, Introduction to Machine Learning, 3rd Edition, MIT Press, 2014

Reference Books:

1   Kevin P. Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012

2   Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer, 2nd Edition, 2011

3   Christopher Bishop, Pattern Recognition and Machine Learning , Springer, 2007

4   https://nptel.ac.in/courses/106105152/

K.S.R. COLLEGE OF ENGINEERING (Autonomous) **R 2018**

<u>**SEMESTER – VI**</u>

18IT672	OPEN SOURCE SOFTWARE (ELECTIVE)	L 3	T 0	P 0	C 3

Prerequisite: *No prerequisite needed for enrolling into the course*

Objective(s):

- *To understand concepts, strategies, and methodologies related to open source software development*
- *To be familiar with open source software products used for storing the information*
- *To develop the software based on the open source programming languages*
- *To understand the basics of the Python programs and its advantages*
- *To utilize open source software PERL for developing a variety of software applications.*

UNIT – I   INTRODUCTION   [9]

Introduction to Open sources - Need of Open Sources - Advantages of Open Sources - Application of Open Sources. Open source operating systems: LINUX: Introduction - General Overview - Kernel Mode and user mode - Process - Advanced Concepts - Scheduling - Personalities - Cloning - Signals - Development with Linux

UNIT – II   OPEN SOURCE DATABASE   [9]

MySQL: Introduction - Setting up account - Starting, terminating and writing SQL programs - Record selection Technology - Working with strings - Date and Time- Sorting Query Results - Generating Summary - Working with metadata - Using sequences – MySQL and Web

UNIT – III   OPEN SOURCE PROGRAMMING LANGUAGES   [9]

PHP: Introduction - Programming in web environment - variables - constants - data types - operators - Statements - Functions - Arrays - OOP - String Manipulation and regular expression - File handling and data storage - PHP and SQL database - PHP and LDAP - PHP Connectivity - Sending and receiving E-mails - Debugging and error handling - Security – Templates

UNIT – IV   PYTHON   [9]

Syntax and Style - Python Objects - Numbers - Sequences - Strings - Lists and Tuples - Dictionaries - Conditionals and Loops - Files - Input and Output - Errors and Exceptions - Functions - Modules - Classes and OOP - Execution Environment

UNIT – V   PERL   [9]

Perl backgrounder - Perl overview - Perl parsing rules - Variables and Data - Statements and Control structures - Subroutines, Packages, and Modules - Working with Files - Data Manipulation

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Discuss concepts, strategies, and methodologies related to open source software development

CO2: Explain with open source software products used for storing the information

CO3: Develop the software based on the open source programming languages

CO4: Make use of the basics of the Python programs and its advantages

CO5: Utilize open source software PERL for developing a variety of software applications

Text Books :

1   Remy Card, Eric Dumas and Frank Mevel, The Linux Kernel Book, Wiley Publications, 2003
2   Steve Suchring, MySQL Bible, John Wiley, 2002

Reference Books :

1   RasmusLerdorf and Levin Tatroe,Programming PHP, O"Reilly, 2002
2   Martin C. Brown, Perl: The Complete Reference, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009
3   Steven Holzner, PHP: The Complete Reference,TMG Publishing Company Limited, Indian Reprint 2009
4   VikramVaswani, MYSQL: The Complete Reference,TMG Publishing Company Limited, Indian Reprint 2009

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

SEMESTER – VI

18IT673	TELECOMMUNICATION AND SWITCHING TECHNIQUES (ELECTIVE)	L	T	P	C
		3	0	0	3

Prerequisite: Computer Networks

Objective(s):

- To develop background knowledge as well as core expertise in telecommunication switching techniques
- To study various telecommunication switching techniques such as time division and space division switching techniques
- To expose through the evolution of switching systems from manual and electromechanical systems to stored program controlled digital systems
- *To explore about traffic Engineering*
- *To learn cellular wireless networks*

UNIT – I   COMPONENTS AND PRINCIPLES   [9]

Transmission Systems - FDM Multiplexing and modulation - Time Division Multiplexing - Digital Transmission and Multiplexing: Pulse Transmission - Line Coding - Binary N-Zero Substitution - Digital Biphase - Differential Encoding - Time Division Multiplexing -Time Division Multiplex Loops and Rings

UNIT – II   SPACE DIVISION AND TIME DIVISION SWITCHING   [9]

Stored Program Control - Centralized And Distributed SPC - 2 stage 3 Stage - *n* Stage Networks - Time Division Time And Space Switching - Time Multiplexed Time And Space Switching - Combination Switching

UNIT – III   TRAFFIC ENGINEERING   [9]

Network Traffic Load and Parameters - Grade of Service and Blocking Probability - Modeling Switching Systems - Blocking Models and Loss Estimates - Delay Models and Queue Analysis

UNIT – IV   DIGITAL SUBSCRIBER ACCESS   [9]

Integrated Services Digital Network - High Data Rate Digital Subscriber Loops - Digital Loop Carrier Systems - Fiber In The Loop - Voice Band Modems - PCM Modems: Local Microwave Distribution Service - Digital Satellite Services

UNIT-V   CELLULAR WIRELESS NETWORKS   [9]

Principles of Cellular Networks - Frequency Reuse - Channel Assignment Strategies - Handoff Strategies - Cordless Systems - Wireless Local Loop - Wireless Application Protocol - Blue Tooth: Radio Specification - Base Band Specification – Link Manager Specification.

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able

CO1: Explain the components and principles of telecommunication switching system
CO2: Extend the knowledge on working principles and structure of the telecommunication switching techniques
CO3: Analyze the concept of traffic engineering and loss estimation
CO4: Discuss the concept of digital subscriber access and digital loop carrier systems
CO5: Summarize the latest trends available in telecommunication switching systems

Text Books :

1   Viswanathan.T, Telecommunication Switching System and Networks, Prentice Hall, New Delhi, 2004
2   William Stallings, Wireless Communication and Networks, Second edition, Pearson Education, New Delhi, 2004

Reference Books :

1   Frenzel, Communication Electronics, Principles and Applications, Tata Mc-Graw Hill Publishing Co. Ltd., Third Edition, New Delhi, 2009

2   John. C. Bellamy, Digital Telephony, John Wiley & Sons, Singapore, 2000

3   Behrouz Forouzan, Introduction to Data Communication and Networking, Tata Mc-Graw Hill, New York, 1996

4   Marion Cole, Introduction to Telecommunications Voice, Data and the Internet, Pearson Education, New Delhi, 2002

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R2018
SEMESTER – VII

18IT761	DISTRIBUTED COMPUTING	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite: Operating Systems

Objective(s):
- To discuss the fundamental of Distributed Systems
- To illustrate the inter process communication
- To examine the services of peer to peer system and file system
- To interpret the system level and support required for distributed system
- To explore the issues involved in studying process and resource management

UNIT – I   INTRODUCTION   [9]
Introduction - Examples of Distributed Systems - Trends in Distributed Systems - Focus on resource sharing - Challenges. Case study: World Wide Web.

UNIT – II   COMMUNICATION IN DISTRIBUTED SYSTEM   [9]
System Model - Inter process Communication - the API for internet protocols - External data representation and Multicast communication - Network virtualization: Overlay networks - Case study: MPI Remote Method Invocation And Objects - Remote Invocation - Introduction - Request reply protocols - Remote procedure call - Remote method invocation - Case study: Java RMI - Group communication - Publish subscribe systems - Message queues - Shared memory approaches - Distributed objects - Case study: Enterprise Java Beans - From objects to components

UNIT – III   PEER TO PEER SERVICES AND FILE SYSTEM   [9]
Peer to peer Systems: Napster and its legacy - Peer to peer - Middleware - Routing overlays - Overlay case studies: Pastry - Tapestry - Distributed File Systems - Introduction - File service architecture - Andrew File system - File System: Features - File model - File accessing models - File sharing semantics Naming: Identifiers - Addresses - Name Resolution – Name Space Implementation - Name Caches - LDAP

UNIT – IV   SYNCHRONIZATION AND REPLICATION   [9]
Introduction - Clocks, events and process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Coordination and Agreement - Introduction - Distributed mutual exclusion - Elections - Transactions and Concurrency Control - Transactions - Nested transactions - Locks - Optimistic concurrency control - Timestamp ordering - Atomic Commit protocols - Distributed deadlocks - Replication - Case study - Coda

UNIT– V   PROCESS & RESOURCE MANAGEMENT   [9]
Process Management: Process Migration - Features - Mechanism - Threads: Models - Issues - Implementation - Resource Management: Introduction - Features of Scheduling - Algorithms - Task Assignment Approach - Load Balancing Approach – Load Sharing Approach

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Discuss trends in Distributed Systems

CO2: Discuss about network virtualization

CO3: Apply remote method invocation and objects

CO4: Comprehend the concept of synchronization, transactions and concurrency control

CO5: Discuss about the process and resource management systems

Text Books :
1. George Coulouris, Jean Dollimore, Tim Kindberg, Distributed Systems Concepts and Design, Fifth Edition , Addison-Wesley, 2012
2. A.S.Tanenbaum, M.Van Steen, Distributed Systems, Pearson Education, 2016

Reference Books :
1. Peter S. Pacheco, An Introduction to Parallel Programming, Morgan- Kauffman/Elsevier, 2011
2. M.L.Liu, Distributed Computing Principles and Applications, Pearson AddisonWesley, 2004
3. Ajay D. Kshemkalyani and Mukesh Singhal, Distributed Computing: Principles, Algorithms and Systems, Cambridge University Press, 2011
4. Distributed Computing : https://nptel.ac.in/courses/106/106/106106168/

K.S.R. COLLEGE OF ENGINEERING (Autonomous) **R2018**
SEMESTER – VII

18IT762	ENTERPRISE NETWORKING	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite: Computer Networks
Objective(s):
- *To demonstrate the knowledge of need and design of Enterprise Networking*
- *To identify the design rules and components in the Enterprise Network*
- *To apply the knowledge to design Data Centre*
- *To learn the technologies used in wireless LAN Design*
- *To explore the WAN technologies and enterprise edge*

UNIT – I **NETWORK DESIGN METHODOLOGY** **[9]**

Architectures for the Enterprise: Borderless Networks Architecture - Collaboration and Video Architecture - Data Center and Virtualization Architecture - Design Lifecycle: Plan Phase - Build Phase - Network Design Models: Benefits and design of the Hierarchical Model

UNIT – II **ENTERPRISE LAN DESIGN** **[9]**

Ethernet Design Rules: 100Mbps Fast Ethernet Design - Gigabit Ethernet Design - 10 Gigabit Ethernet Design - 10GE Media Types - Ether Channel - Campus Media LAN Hardware: Layer 3 Switches - Unidirectional Link Detection (UDLD) Protocol. Types of LAN: Large - Building LANs, Enterprise Campus LANs - Edge Distribution - Medium - Size LANs - Small and Remote Site LANs – Enterprise Data Center Infrastructure

UNIT – III **ENTERPRISE DATA CENTER DESIGN** **[9]**

Enterprise Data Centre Architecture - Components - Topology Components - Data Center Facility Aspects - Data Center Space - Data Center Power - Data Center Cooling - Data Center Heat - Data Center Cabling - Enterprise DC Infrastructure - Data Center Storage - Data Center Reference Architecture - Defining the DC Access Layer and DC Aggregation Layer – Defining the DC Core Layer – Security in the DC

UNIT – IV **WIRELESS LAN DESIGN** **[9]**

Wireless LAN Technologies - WLAN Standards - ISM and UNII Frequencies - Service Set Identifier - WLAN Layer 2 Access Method - WLAN Security - Unauthorized Access - WLAN Authentication - Authentication Options - WLAN Controller Components - WLC Interface Types - AP Controller Equipment Scaling - Roaming and Mobility Groups - Intra controller Roaming - Layer 2 Inter controller Roaming - Layer 3 Inter controller Roaming - Power over Ethernet (PoE) - Wireless and Quality of Service (QoS) – Branch Design Considerations

UNIT– V **WAN TECHNOLOGIES AND THE ENTERPRISE EDGE** **[9]**

Definition of WAN - WAN Edge Module - Enterprise Edge Modules - WAN Transport Technologies - ISDN - ISDN BRI Service - ISDN PRI Service - Digital Subscriber Line - Metro Ethernet - SONET/SDH - Multiprotocol Label Switching (MPLS) - Dark Fiber - WAN and Edge Design Methodologies - Response Time - Throughput - Reliability - Bandwidth Considerations

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Examine various phases involved in network design
CO2: Apply the rules in the design of Enterprise Network
CO3: Identify the components involved in design of Wireless LAN
CO4: Interpret the technologies used in wireless LAN Design
CO5:Comprehend technologies in WAN and enterprise edge

Text Books :
1 Cisco Networking Academy, Enterprise Networking, Security and Automation Companion Guide (CCNAV7),CISCO , 2020
2 Ray Grenier, George Metes ,Enterprise Networking - Working Together Apart , Digital Press, 2008

Reference Books :
1 Vasilis Theoharakis, Dimitrios Nikolaou Serpanos ,Enterprise Networking : Multilayer Switching and Applications, Idea Group Pub.,2002
2 Bongsik Shin , A Practical Introduction to Enterprise Network and Security Management, 2nd Edition , CRC Press , 2021
3 Tim Szigeti, David Zacks, Matthias Falkner, Simone Arena , Cisco Digital Network Architecture Intent-based Networking for the Enterprise, Pearson Education , 2018

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R2018**

SEMESTER – VII

18IT763	**DIGITAL IMAGE PROCESSING**	**L**	**T**	**P**	**C**
	(ELECTIVE)	**3**	**0**	**0**	**3**

Prerequisite: Engineering Mathematics - I

Objective(s):

- *To illustrate the fundamentals of digital image processing*
- *To comprehend the techniques in image enhancement*
- *To enumerate about various image segmentation and restoration concepts*
- *To interpret with image compression and segmentation techniques*
- *To recognize representation of image in form of features*

UNIT – I   DIGITAL IMAGE FUNDAMENTALS   **[9]**

Introduction - Origin - Steps in Digital Image Processing - Components - Elements of Visual Perception - Image Sensing and Acquisition - Image Sampling and Quantization - Relationships between pixels - Color models

UNIT – II   IMAGE ENHANCEMENT   **[9]**

Spatial Domain: Gray level transformations - Histogram processing - Basics of Spatial Filtering- Smoothing and Sharpening Spatial Filtering - Frequency Domain: Introduction to Fourier Transform - Smoothing and Sharpening frequency domain filters – Ideal , Butterworth and Gaussian filters

UNIT – III IMAGE RESTORATION AND SEGMENTATION   **[9]**

Noise models - Mean Filters - Order Statistics - Adaptive filters - Band reject Filters - Band pass Filters - Notch Filters - Optimum Notch Filtering - Inverse Filtering - Wiener filtering Segmentation: Detection of Discontinuities-Edge Linking and Boundary detection - Region based segmentation - Morphological processing - Erosion and dilation

UNIT – IV   WAVELETS AND IMAGE COMPRESSION   **[9]**

Wavelets - Sub band coding - Multi resolution expansions - Compression: Fundamentals - Image Compression models - Error Free Compression - Variable Length Coding - Bit- Plane Coding - Lossless Predictive Coding - Lossy Compression - Lossy Predictive Coding – Compression Standards

UNIT – V IMAGE REPRESENTATION AND RECOGNITION   **[9]**

Boundary representation - Chain Code - Polygonal approximation - Signature - Boundary segments - Boundary description - Shape number - Fourier Descriptor - Moments - Regional Descriptors - Topological feature - Texture - Patterns and Pattern classes – Recognition based on matching

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Discuss digital image fundamentals and the relations pixels and color models

CO2: Apply image enhancement and restoration techniques

CO3: Make use of image compression and segmentation techniques for processing the image

CO4: Identify features of different wavelets coding

CO5 :Summarize the image representation concepts

Text Books :

1   Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, 4th Edition, Pearson, 2018

2   William K. Pratt, Digital Image Processing , 4th Edition, John Wiley & Sons, 2013

Reference Books:

1 Anil Jain K. ,Fundamentals of Digital Image Processing, PHI Learning Pvt. Ltd., 2011

2 Malay K. Pakhira, Digital Image Processing and Pattern Recognition, First Edition, PHI Learning Pvt. Ltd., 2011

3 Rafael C. Gonzalez, Richard E. Woods, Steven L. Edins, Digital Image Processing Using MATLAB, Third Edition ,Tata McGraw Hill Pvt. Ltd., 2011

4 https://nptel.ac.in/courses/117/105/117105079/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - VII**</u>

	QUANTUM COMPUTING	**L**	**T**	**P**	**C**
18IT764	**(ELECTIVE)**	**3**	**0**	**0**	**3**

Prerequisite: No prerequisite needed for enrolling into the course

Objectives:

- *To understand the concepts of Quantum bits and algorithms*
- *To equip the students to explore the quantum computation*
- *To comprehend the principles and types of quantum computer*
- *To get exposed to label the limitation of quantum operations*
- *To analyze the concepts of quantum error and its correction*

UNIT – I   **FUNDAMENTAL CONCEPTS**   **[9]**

Global Perspectives - Quantum Bits - Quantum Computation - Quantum Algorithms - Quantum Information - Postulates of Quantum Mechanisms

UNIT – II   **QUANTUM COMPUTATION**   **[9]**

Quantum Circuits - Quantum algorithms - Single Orbit operations - Control Operations - Measurement - Universal Quantum Gates - Simulation of Quantum Systems - Quantum Fourier Transform - Phase estimation - Applications - Quantum search algorithms - Quantum counting - Speeding up the solution of NP - complete problems - Quantum Search for an unstructured database

UNIT– III   **QUANTUM COMPUTERS**   **[9]**

Guiding Principles - Conditions for Quantum Computation - Harmonic Oscillator Quantum Computer - Optical Photon Quantum Computer - Optical Cavity Quantum Electrodynamics - Nuclear Magnetic Resonance

UNIT – IV   **QUANTUM INFORMATIONS**   **[9]**

Quantum Noise and Quantum Operations - Classical Noise and Markov Processes - Quantum Operations - Examples of Quantum noise and Quantum Operations - Applications of Quantum operations - Limitations of the Quantum operations formalism – Distance Measures for Quantum information

UNIT – V   **QUANTUM ERROR CORRECTION**   **[9]**

Introduction - Shor code - Theory of Quantum Error - Correction - Constructing Quantum Codes - Stabilizer codes - Fault - Tolerant Quantum Computation - Entropy and information - Shannon Entropy - Basic properties of Entropy - Von Neumann - Strong Sub additivity - Data Compression - Entanglement as a physical resource - Case study: ShorVis - Quantum Computing Visualization

                                                        Total = 45 Periods

Course Outcomes: On Completion of this Course, the student will be able to

CO1: Discuss about quantum bits and quantum computation
CO2: Summarize quantum circuits and NP-Complete problems
CO3: Classify the various types of quantum computers
CO4: Analyze the concept of quantum operations
CO5: Analyze the different error correction techniques in quantum computing

Text Book:

1   David McMahon , Quantum Computing - Explained, John Wiley & Sons, 2016

References :

1   Nielsen , Michael A. Nielsen, Isaac L. Chuang, Quantum Computation and Quantum Information , Cambridge University Press , 2010

2   Phillip Kaye , Raymond Laflamme , Michele Mosca , An Introduction to Quantum Computing , Oxford University Press , 2007

3   Jack D. Hidary ,Quantum Computing: An Applied Approach, Springer International Publishing, 2019

4   Quantum Information and Computing : https://nptel.ac.in/courses/115/101/115101092/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　**R 2018**

SEMESTER – VII

	VIDEO ANALYTICS	L	T	P	C
18IT765	(Common to CE, EE & IT) **(ELECTIVE)**	3	0	0	3

Prerequisite: *No prerequisite needed for enrolling into the course*
Objective(s):

- *To understand the need for video Analytics*
- *To explore about the various classification algorithms*
- *To get exposed to the various applications of video analytics*
- *To comprehend the security aspects in video analytics*
- *To explore the various applications of video analytics*

UNIT – I　　　VIDEO ANALYTIC COMPONENTS　　　　　　**[9]**

Need for Video Analytics - Video Analytics - Foreground Extraction - Feature Extraction - Classifier - Preprocessing - Edge Detection - Smoothening - Feature Space - PCA - FLD - SIFT Features

UNIT – II　　　FOREGROUND EXTRACTION　　　　　　**[9]**

Background Estimation - Averaging - Gaussian Mixture Model - Optical Flow based- Image Segmentation - Region Growing - Region Splitting - Morphological Operations - Erosion- Dilation - Tracking in a multiple camera environment

UNIT – III　　　CLASSIFIERS　　　　　　**[9]**

 Neural Networks (Back Propagation) - Deep Learning Networks - Fuzzy Classifier- Bayesian Classifier - HMM Based classifier

UNIT – IV　　　VIDEO ANALYTICS FOR SECURITY　　　　　　**[9]**

Abandoned Object Detection - Human Behavioral Analysis - Human Action Recognition - Perimeter Security - Crowd Analysis and Prediction of Crowd Congestion

UNIT– V　　　APPLICATIONS OF VIDEO ANALYTICS　　　　　　**[9]**

Customer Behavior Analysis - People Counting - Traffic Rule Violation Detection - Traffic Congestion Identification for Route Planning - Driver Assistance - Lane Change Warning - Forensic video analysis

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Interpret the knowledge about various components of video analytics
CO2: Summarize foreground extraction techniques
CO3: Apply various classifier algorithms for the given target application
CO4: Discuss about security principles for business intelligence
CO5: Explain the various applications of video analytics

Text Books :

1　Graeme A. Jones, Nikos Paragios, Carlo S. Regazzoni, Video- Based Surveillance Systems: Computer Vision and Distributed Processing , Kluwer Academic Publisher, 2002

2　Nilanjan Dey , Amira Ashour and Suvojit Acharjee, Applied Video Processing in Surveillance and Monitoring Systems, IGI Global, 2016

Reference Books :

1　Zhihao Chen, Ye Yang, Jingyu Xue, Liping Ye, Feng Guo, The Next Generation of Video Surveillance and Video Analytics:The Unified Intelligent Video Analytics Suite, Create Space Independent Publishing Platform, 2014

2　Aifeng Shan, Fatih Porikli, Tao Xiang, Shaogang Gong, Video Analytics for Business Intelligence, Springer, 2012

3　Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012

4　Oges Marques, Practical Image and Video Processing Using MATLAB, Wiley- IEEE Press, 2011

18IT766	BUSINESS INTELLIGENCE AND APPLICATIONS (ELECTIVE)	L	T	P	C
		3	0	0	3

Prerequisite: Data Analytics
Objectives:

- *To comprehend the fundamental of business intelligence*
- *To explore about data integration and technologies for building data warehouse*
- *To analyze business data using SSIS for ETL in the current market*
- *To understand the concept of multidimensional data modeling and KPIs*
- *To analyze enterprise reports and application of the concepts using open Source tools*

UNIT – I   BUSINESS INTELLIGENCE   [9]

Digital Data : Types : Structured - Semi Structured and Unstructured - OLTP and OLAP - OLAP Architectures - Data Models - BI Definitions - Applications - BI Framework - Process and Technology - Roles and Responsibilities - Industry Best Practices

UNIT – II   DATA INTEGRATION   [9]

Data Warehouse - Need and Goals of Data Warehouse - Data Integration - Need and Advantages of Data Integration - Common Data Integration Approaches - Data Integration Technologies - Data Quality - Data Profiling Concepts and Applications – Introduction to ETL using SSIS.

UNIT– III   DATA FLOW AND TRANSFORMATIONS   [9]

SSIS Architecture - Introduction to ETL using SSIS - Integration Services Objects - Data Flow Components - Sources, Transformations and Destinations - Working with Transformations - Containers - Tasks - Precedence Constraints and Event Handlers

UNIT – IV   MULTIDIMENSIONAL DATA MODELING   [9]

Data and Dimension Modeling : Types of Data Model - Data Modeling Techniques - Fact Table -Dimension Table - Typical Dimensional Models - Dimensional Model Life Cycle - Introduction to Business Metrics and KPIs - Creating Cubes using SSAS

UNIT – V   ENTERPRISE REPORTING   [9]

Enterprise Reporting: Reporting Perspectives - Report Standardization and Presentation Practices - Enterprise Reporting Characteristics in OLAP - Concepts of Balanced Scorecards - Dashboards: Create Dashboards - Scorecards Vs Dashboards - SSRS Architecture - Enterprise Reporting using SSRS - Case Study: Netflix Recommendation

Total : 45 Periods

Course Outcomes: On Completion of this Course, the student will be able to

CO1: Compare Transaction Processing and Analytical applications and describe the need for Business Intelligence
CO2: Comprehend of technology and processes associated with Business Intelligence framework
CO3: Discuss about data warehouse implementation methodology
CO4: Explain multidimensional data modeling to achieve the business goal
CO5: Demonstrate an enterprise dashboard that depicts the key performance indicators which helps in decision making

Text Books:

1   RN Prasad and Seema Acharya, Fundamentals of Business Analytics, John Wiley India Pvt. Ltd, 2014

2   David Loshin, Business Intelligence, Morgan Kaufmann Publishers, 2003

References :

1   Mike Biere, Business Intelligence for the Enterprise, IBM Press, 2nd Edition, 2003

2   Stephen Few, Information Dashboard Design, O'Reilly Media, 2006

3   Guy Fouché and Lynn Langit, Foundations of SQL Server 2008 R2 Business Intelligence, Après, 2nd Edition, 2008

4   https://research.netflix.com/research-area/recommendations

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER - VIII**</u>

18IT861	PATTERN RECOGNITION (ELECTIVE)	L T P C 3 0 0 3

Prerequisite: Statistical and Data mining

Objectives:

- *To learn the fundamentals of Pattern Recognition techniques*
- *To learn the various Statistical Pattern recognition techniques*
- *To learn the various supervised & unsupervised learning techniques*
- *To learn the various Syntactical Pattern recognition techniques*
- *To learn the Neural Pattern recognition techniques*

UNIT – I   PATTERN RECOGNITION OVERVIEW   **[9]**

Pattern recognition - Classification and Description - Patterns and feature Extraction with Examples -Training and Learning in PR systems - Pattern recognition Approaches

UNIT – II   STATISTICAL PATTERN RECOGNITION   **[9]**

Introduction to statistical Pattern Recognition - Supervised Learning using Parametric and Non Parametric Approaches

UNIT – III   LINEAR DISCRIMINANT FUNCTIONS AND UNSUPERVISED LEARNING AND CLUSTERING   **[9]**

Introduction - Discrete and binary Classification problems - Techniques to directly Obtain linear Classifiers -- Formulation of Unsupervised Learning Problems - Clustering for unsupervised learning and classification

UNIT – IV   SYNTACTIC PATTERN RECOGNITION   **[9]**

Overview of Syntactic Pattern Recognition - Syntactic recognition via parsing and other grammars - Graphical Approaches to syntactic pattern recognition - Learning via grammatical inference

UNIT – V   NEURAL PATTERN RECOGNITION   **[9]**

Introduction to Neural networks - Feed forward Networks and training by Back Propagation - Content Addressable Memory Approaches and Unsupervised Learning in Neural RR

Total = 45 Periods

Course Outcomes: On Completion of this Course, the student will be able to

CO1: Discuss the basic concepts of Pattern Recognition and its approaches
CO2: Illustrate various statistical methods for supervised learning classification
CO3: Evaluate the Clustering for Unsupervised learning classification
CO4: Apply various syntactic pattern classification methods for recognizing the pattern
CO5: Analyze neural networks and Pattern Recognition methods

Text Books:

1   *Robert Schalkoff, Pattern Recognition: Statistical Structural and Neural Approaches, John Wiley & sons, Inc, 2012(Reprint edition)*

References :

1   *Earl Gose, Richard johnsonbaugh, Steve Jost, Pattern Recognition and Image Analysis, Prentice Hall of India,.Pvt Ltd, New Delhi, 1996*

2   *Duda R.O., P.E.Hart & D.G Stork, Pattern Classification, 2nd Edition, J.Wiley Inc 2001*

3   *Duda R.O.& Hart P.E., Pattern Classification and Scene Analysis, J.wiley Inc, 2013.*

4   *Earl Gose, Richard johnsonbaugh, Steve Jost, Pattern Recognition and Image Analysis, Prentice Hall of India,.Pvt Ltd, New Delhi, 1996*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VIII**</u>

		L	T	P	C
18IT862	**GREEN COMPUTING** **(ELECTIVE)**	3	0	0	3

Prerequisite: No prerequisite needed for enrolling into the course

Objective(s):

- *To acquire knowledge to adopt green computing practices.*
- *To learn about green environment architecture*
- *To minimize energy consumption.*
- *To understand how to reduce the requirements for the disposal of Equipment.*
- *To manage improved environmental sustainability.*

UNIT - I   FUNDAMENTALS   [9]

Green IT Fundamentals: Business - IT and the Environment - Green IT Strategies: Drivers - Dimensions - And Goals - Environmentally Responsible Business: Policies - Practices and Metrics - Green computing: Carbon Foot Print - Scoop on Power

UNIT- II   GREEN ASSETS AND MODELING   [9]

Green Assets: Buildings - Data Centers - Networks and Devices - Green Business Process Management: Modeling - Optimization and Collaboration - Green Enterprise Architecture - Environmental Intelligence and Green Supply Chains - Green Information Systems – Design and Development Models

UNIT -III   RECYCLING AND TELECOMMUTING   [9]

Choosing Your Green PC Path: Buying a Green Computer - Recycling Your Computer - Greener Under the Hood: Optimize Your Computer Power Management - Greening Mobile Devices - Telecommuting - Teleconferencing and Teleporting -: Making the Case for Telecommuting - Telecomm Central: The Green Home Office - Collaborating and Cloud Computing

UNIT - IV   GREEN COMPLIANCE   [9]

Socio cultural Aspects of Green IT - Green Enterprise Transformation Roadmap Green Compliance: Protocols - Standards - and Audits - Emergent Carbon Issues: Technologies and Future

UNIT - V   CASE STUDIES   [9]

The Environmentally Responsible Business Strategies - Research Survey - Case Study Scenarios for Trial Runs - Studies in Applying Green IT Strategies and Applications to a Hospital - Packaging Industry and Telecom Sector

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Explain green computing technology to reduce paper wastage and carbon footprint
CO2: Describe behaviour and capabilities of green assets and processes
CO3: Discuss about Recycling and Telecommuting
CO4: Utilize the resources in a socio economic manner
CO5: Evaluate the environmental impacts of green activities

Text Books :

1 Bhuvan Unhelkar,Green IT Strategies and Applications: Using Environmental Intelligence, CRC Press, April 2016
2 Woody Leonhard, Katherrine Murray, Green Home Computing for Dummies, August 2009

Reference Books :

1 Wu Chun Feng (editor), Green computing: Large Scale energy efficiency, CRC Press, 2012

2 John Lamb, The Greening of IT, Pearson Education, 2009

3 Jason Harris, Green Computing and Green IT - Best Practices on Regulations & Industry, Lulu.com, 2008

4 Carl Speshocky, Empowering Green Initiatives with IT, John Wiley & Sons, 2010

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>**SEMESTER – VIII**</u>

18IT863	**REASONING AND EXPERT SYSTEM**	**L**	**T**	**P**	**C**
	(ELECTIVE)	**3**	**0**	**0**	**3**

Prerequisite: *Fundamentals of Artificial Intelligence Concepts*

Objective(s):

- *To study the idea of intelligent agents and search methods*
- *To study about representing knowledge*
- *To study the reasoning and decision making in uncertain world*
- *To construct plans and methods for generating knowledge*
- *To study the concepts of expert systems*

UNIT -I   INTRODUCTION   **[9]**

Introduction to AI - Intelligent agents - Perception - Natural language processing - Problem Solving agents - Searching for solutions - Uniformed search strategies - Informed search strategies

UNIT -II   KNOWLEDGE AND REASONING   **[9]**

Adversarial search - Optimal and imperfect decisions - Alpha Beta pruning - Logical agents: Propositional logic - First order logic - Syntax and semantics - Using first order logic - Inference in first order logic

UNIT -III   UNCERTAIN KNOWLEDGE AND REASONING   **[9]**

Uncertainty - Acting under uncertainty - Basic probability notation - Axioms of probability - Baye"s rule - Probabilistic reasoning – Making simple decisions

UNIT - IV   PLANNING AND LEARNING   **[9]**

Planning: Planning problem - Partial order planning - Planning and acting in non-deterministic domains - Learning: Learning decision trees - Knowledge in learning - Neural networks - Reinforcement learning - Passive and active

UNIT - V   EXPERT SYSTEMS   **[9]**

Definition - Features of an expert system - Organization - Characteristics - Prospector - Knowledge Representation in expert systems – Expert system tools – MYCIN – EMYCIN

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Explain the idea of intelligent agents and search methods

CO2: Describe about knowledge

CO3: Interpret the knowledge in reasoning and decision making of uncertain world

CO4: Utilize plans and methods for generating knowledge

CO5: Discover the Concept of expert systems

Text Books :

1 Stuart Russel and Peter Norvig, Artificial Intelligence A Modern Approach, Fourth Edition, Pearson Education, 2020 / PHI

2 Michael Negnevitsky Artificial Intelligence: A Guide to Intelligent Systems, Third edition,2011

Reference Books :

1 George F.Luger, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, Sixth Edition, Pearson Education, 2016

2 Kevin Knight, Elaine Rich, Shivashankar B. Nair ARTIFICIAL INTELLIGENCE Third edition,2017

3 V S Janakiraman; P Gopalakrishnan; K Sarukesi Foundations of Artificial Intelligence and Expert Systems,2017

4 https://www.geeksforgeeks.org/expert-systems/

K.S.R. COLLEGE OF ENGINEERING (Autonomous) R 2018

<u>**SEMESTER – VIII**</u>

18IT864	INFORMATION THEORY AND CODING TECHNIQUES	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite: Fundamentals of Artificial Intelligence Concepts

Objective(s):

- *To understand error control coding*
- *To understand encoding and decoding of digital data streams*
- *To be familiar with the methods for the generation of these codes and their decoding techniques*
- *To be aware of compression and decompression techniques*
- *To learn the concepts of multimedia communication*

UNIT – I   INFORMATION ENTROPY FUNDAMENTALS   [9]

Uncertainty, Information and Entropy - Source coding Theorem - Huffman coding -Shannon Fano coding - Discrete Memory less channels - channel capacity - channel coding Theorem - Channel capacity Theorem

UNIT – II   DATA AND VOICE CODING   [9]

Differential Pulse code Modulation - Adaptive Differential Pulse Code Modulation - Adaptive subband coding - Delta Modulation - Adaptive Delta Modulation - Coding of speech signal at low bit rates (Vocoders, LPC)

UNIT – III   ERROR CONTROL CODING   [9]

Linear Block codes - Syndrome Decoding - Minimum distance consideration - cyclic codes - Generator Polynomial - Parity check polynomial - Encoder for cyclic codes - calculation of syndrome - Convolutional codes

UNIT – IV   COMPRESSION TECHNIQUES   [9]

Principles - Text compression - Static Huffman Coding - Dynamic Huffman coding - Arithmetic coding - Image Compression – Graphics Interchange format - Tagged Image File Format - Digitized documents - Introduction to JPEG standards

UNIT – V   MULTIMEDIA COMMUNICATION   [9]

Linear Predictive coding - code excited LPC - Perceptual coding, MPEG audio coders - Dolby audio coders - Video compression - Principles - Introduction to H.261 & MPEG Video standards

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Discuss about *Information Theory fundamentals*

CO2: *Discuss encoding and decoding of digital data streams*

CO3: *Explain the methods for error control codes*

CO4: Classify *compression and decompression techniques*

CO5: *Examine the concepts of multimedia communication*

Text Books :

 1 Shu Lin, Daniel J.Costello,Jr., Error Control Coding- Fundamentals and Applications, Prentice Hall, Inc 2014

 2 Ranjan Bose, Information Theory, Coding and Cryptography, 2nd Edition, Tata McGraw-Hill, 2009

Reference Books :

1 Dr. J. S. Chitode, Information Coding Techniques, 1st edition, Technical Publications, 2007

2 Thomas M. Cover, Joy A. Thomas, Elements of Information Theory 2nd edition, A Wiley-Interscience Publication, 2006

3 Fred Halsall, Multimedia Communications, Applications Networks Protocols and Standards, Pearson Education, Asia 2002

4 Simon Haykin, Communication Systems,,4th Edition, John Wiley and Sons, 2001

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – VIII</u>

		L	T	P	C
18IT865	**WIRELESS SENSOR NETWORKS**	3	0	0	3
	(ELECTIVE)				

Prerequisite: Fundamentals of Network

Objective(s):

- *To understand the basics of wireless concepts*
- *To know about MAC layer functionality*
- *To understand the concepts of routing techniques*
- *To know the functionality of mobility management*
- *To know about QoS related with wireless networks*

UNIT – I   WIRELESS SYSTEMS   [9]

Cellular concept - Cellular architecture - Cellular systems -1G - 2G - 3G - Wireless in Local Loop - Wireless ATM. Broadband Wireless Access - UWB - Wireless IEEE Standards - IEEE802.11a - IEEE802.11b - IEEE802.16 - HIPERACCESS - IEEE802.20 - IEEE802.21 and IEEE802.22 - Optical wireless networks

UNIT – II   MAC   [9]

Introduction - 4G systems - Hybrid 4G network protocols - Channel modeling for 4G - MIMO and UWB - Adaptive and Reconfigurable Link layer - Adaptive MAC - AMC - HARQ - CDMA - TDMA / OFDMA - Software radio - DAB - DVB

UNIT – III   ROUTING   [9]

Network overlay in 4G - Network synchronization and Power optimal routing - Adaptive network layer - Routing with topology aggregation - Adaptive resource management - Network deployment and management

UNIT – IV   MOBILITY MANAGEMENT   [9]

Mobility management - Concept - Requirements and operations - Mobility support for LAN / MAN - Mobility management models - Macro mobility and Micro mobility - Mobile IP - MIPv6 - HMIP - Cellular IP - HAWAII and IDMP - Context aware mobility management

UNIT – V   TCP AND QoS   [9]

Adaptive TCP and Cross layer optimization - Positioning in wireless networks - QoS - Issues- Classifications of QoS approaches - MAC and Network layer solutions - QoS framework - QoS models - QoS Resource reservation signaling - INSIGNIA – INORA – SWAN and proactive RTMAC

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Discuss *the basics of wireless system concepts*

CO2: *Explain MAC layer functionality*

CO3: Interpret *the different routing techniques*

CO4: *Illustrate mobility management*

CO5: *Analyze TCP and QoS with respect to wireless network*

Text Books :

 1 Shu Lin, Daniel J.Costello,Jr., Error Control Coding- Fundamentals and Applications Prentice Hall, Inc 2014

 2 Ranjan Bose, Information Theory, Coding and Cryptography, 2nd Edition, Tata McGraw-Hill, 2009

Reference Books :

1 Dr. J. S. Chitode, Information Coding Techniques 1st edition, Technical Publications, 2007

2 Thomas M. Cover, Joy A. Thomas, Elements of Information Theory 2nd edition, A Wiley-Interscience Publication, 2006

3 Fred Halsall, Multimedia Communications, Applications Networks Protocols and Standards, Pearson Education, Asia 2002

4 Simon Haykin,Communication Systems,4th Edition, John Wiley and Sons, 2001

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – VIII</u>

18IT866	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite: *Fundamentals of Software Engineering*
Objective(s):

- *To develop an awareness of the need for project planning and management*
- *To learn about the stages in the software development lifecycle and associated activities*
- *To know about the procedures needed to schedule, monitor and control the project*
- *To discuss and where appropriate apply the principles of project risk management*
- *To understand the key concepts relating to managing projects*

UNIT – I   FUNDAMENTALS   [9]

Conventional software management - Evolution of software economics - Improving software economics - Conventional Vs Modern software project management

UNIT – II   SOFTWARE MANAGEMENT PROCESS FRAMEWORK   [9]

Lifecycle phases - Artifacts of the process - Model based software architectures -Workflows of the process - Checkpoints of the process

UNIT – III   SOFTWARE PROCESS MATURITY MODELS   [9]

Quality management and ISO 9000 - Process improvements - SCI/CMM models - Other process models. Iterative process planning - Organization and Responsibilities - Process automation - Process control and process instrumentation - Tailoring the process

UNIT – IV   SOFTWARE EFFORT ESTIMATION   [9]

Issues in effort estimation - Effort Estimation techniques - Expert judgment - Estimation by Analogy - Albrecht Function Point Analysis - COCOMO Cost Estimation Model - Project planning - Scheduling - Tracking and Control - Time and Cost overruns

UNIT – V   SOFTWARE RISK AND PEOPLE MANAGEMENT   [9]

Nature of Risk - Managing Risk - Risk Identification - Risk Analysis - Risk Reduction Techniques - Managing People and Organizing Teams

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to
CO1: Interpret the concept of software Economics
CO2: Discuss about software management process framework
CO3: Explain software process maturity models
CO4: Identify software activity planning techniques
CO5: Analyze risk involved in software project

Text Books :

1 Bob Hughes, Mike Cotterell, Rajib Mall Software Project Management, Sixth edition, Tata Mc Graw Hill, 2017

2 Walker Royce ,Software Project Management A Unified Framework, Pearson Education, 2004

Reference Books :

1 Rishabh Anand ,Software Project Management S.K. Kataria & Sons, 2013

2 S.A. Kelkar, Software Project Management: A Concise Study , PHI Learning 2013

3 Ramesh Gopalaswamy, Managing Global Software Projects, Tata McGraw Hill, 2017

4 Humphrey Watts, Managing the software process Addison Wesley, 2002

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – VIII</u>

18IT867	**SEMANTIC WEB**	**L**	**T**	**P**	**C**
	(ELECTIVE)	**3**	**0**	**0**	**3**

Prerequisite:

Objective(s):

- To understand the need of semantic web in web services
- To know the methods to discover, classify and build ontology for more reasonable results in searching
- *To know about the structure and web Resources*
- *To discuss about Web Ontology Language*
- *To understand the use of Semantic Web tools and Applications*

UNIT – I   INTRODUCTION   [9]

Introduction to the Syntactic web and Semantic Web - Evolution of the Web - The visual and syntactic web - Levels of Semantics - Metadata for web information - The semantic web architecture and technologies - Contrasting Semantic with Conventional Technologies - Semantic Modeling - Potential of semantic web solutions and challenges of adoption

UNIT – II   ONTOLOGICAL ENGINEERING   [9]

Ontologies - Taxonomies - Topic Maps - Classifying Ontologies - Terminological aspects: concepts, terms, relations between them - Complex Objects - Subclasses and Subproperties definitions - Upper Ontologies - Quality - Uses - Types of terminological resources for ontology building - Methods and methodologies for building ontologies - Multilingual Ontologies - Ontology Development process and Life cycle - Methods for Ontology Learning - Ontology Evolution - Versioning

UNIT – III   STRUCTURING AND DESCRIBING WEB RESOURCES   [9]

Structured Web Documents - XML - Structuring - Namespaces - Addressing - Querying - Processing - RDF -RDF Data Model - Serialization Formats- RDF Vocabulary -Inferencing - RDFS - basic Idea - Classes - Properties - Utility Properties – RDFS Modeling for Combinations and Patterns - Transitivity

UNIT – IV   WEB ONTOLOGY LANGUAGE   [9]

OWL - Sub Languages - Basic Notions - Classes - Defining and Using Properties - Domain and Range - Describing Properties - Data Types - Counting and Sets - Negative Property Assertions - Advanced Class Description - Equivalence – Owl Logic

UNIT – V   SEMANTIC WEB TOOLS AND APPLICATIONS   [9]

Development Tools for Semantic Web - Jena Framework - SPARL - Querying semantic web - Semantic Wikis - Semantic Web Services - Modeling and aggregating social network data - Ontological representation of social relationships- Aggregating and reasoning with social network data

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: *Discuss semantic web basics, architecture and technologies*

CO2: *Interpret data from a chosen problem in XML with appropriate semantic tags obtained from the ontology*

CO3: *Explain the semantic relationships among semantic data elements using Resource Description framework*

CO4: D*esign and implement a web services application that "discovers" the data and/or other web services*

CO5: Di*scover the capabilities and limitations of semantic web technology for social networks*

Text Books :

1 Liyang Yu, A Developer's Guide to the Semantic Web, Springer, First Edition, 2011

2 Karin Breitman, Marco Antonio Casanova and Walt Truszkowski, Semantic Web: Concepts, Technologies and Applications (NASA Monographs in Systems and Software Engineering), Springer, Softcover, 2010

Reference Books :

1 Robert M. Colomb, Ontology and the Semantic Web, Volume 156 Frontiers in Artificial Intelligence and Applications (Frontier in Artificial Intelligence and Applications), IOS Press, 2007

2 Dean Allemang and James Hendler, Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL, Morgan Kaufmann, Second Edition, 2011

3 Michael C. Daconta, Leo J. Obrst and Kevin T. Smith, The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management, Wiley, First Edition 2003

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – VIII</u>

18IT868	CYBER FORENSICS (ELECTIVE)	L	T	P	C
		3	0	0	3

Prerequisite:
Objective(s):

- *To learn computer forensics*
- *To become familiar with forensics tools*
- *To learn to analyze and validate forensics data*
- *To understand the concept of Ethical Hacking*
- *To know about Ethical Hacking in web*

UNIT – I   INTRODUCTION TO COMPUTER FORENSICS   [9]

Introduction to Traditional Computer Crime - Traditional problems associated with Computer Crime - Introduction to Identity Theft & Identity Fraud- Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation - Preparation for IR: Creating response tool kit and IR team - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition

UNIT – II   EVIDENCE COLLECTION AND FORENSICS TOOLS   [9]

Processing Crime and Incident Scenes - Working with Windows and DOS Systems - Current Computer Forensics Tools: Software/ Hardware Tools

UNIT – III   ANALYSIS AND VALIDATION   [9]

Validating Forensics Data - Data Hiding Techniques - Performing Remote Acquisition - Network Forensics - Email Investigations – Cell Phone and Mobile Devices Forensics

UNIT – IV   ETHICAL HACKING   [9]

Introduction to Ethical Hacking - Foot printing and Reconnaissance - Scanning Networks - Enumeration - System Hacking - Malware Threats – Sniffing

UNIT – V   ETHICAL HACKING IN WEB   [9]

Social Engineering - Denial of Service - Session Hijacking - Hacking Web servers - Hacking Web Applications - SQL Injection – Hacking Wireless Networks – Hacking Mobile Platforms

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to
CO1: *Explain the basics of computer forensics*
CO2: *Apply a number of different computer forensic tools to a given scenario*
CO3: *Analyze and validate forensics data*
CO4: *Identify the vulnerabilities in a given network infrastructure*
CO5: Construct *real world hacking techniques to test system security*

Text Books :

1 Bill Nelson, Amelia Phillips, Frank Enfinger, Christopher Steuart, Guide to Computer Forensics and Investigations, Cengage Learning, India Edition, 2020

2 Ric Messier,CEH V10 official Certfied Ethical Hacking Review Guide, Wiley India Edition, 2019

Reference Books :

1 MarjieT.Britz, Computer Forensics and Cyber Crime: An Introduction, 3rd Edition, Prentice Hall, 2020

2 Kenneth C.Brancik Insider Computer Fraud,Auerbach Publications Taylor &amp, Francis Group-2019

3 John R.Vacca,Computer Forensics, Cengage Learning, 2015

4 AnkitFadia Ethical Hacking, Macmillan India Ltd, 2006

SEMESTER – VIII

		L	T	P	C
18IT869	**SOFT COMPUTING** (ELECTIVE)	3	0	0	3

Prerequisite:

Objective(s):
- *To learn the various soft computing frame works*
- *To be familiar with design of various neural networks*
- *To be exposed to fuzzy logic*
- *To learn genetic programming*
- *To be exposed to hybrid systems*

UNIT – I　　INTRODUCTION　　　　　　　　　　　　　　　　　　　[9]

Artificial neural network: Introduction - characteristics - learning methods -Taxonomy - Evolution of neural networks - Basic models - Important technologies - Applications - Fuzzy logic: Introduction - Crisp sets - Fuzzy sets - Crisp relations and fuzzy relations: Cartesian product of relation - Classical relation - Fuzzy relations - Tolerance and equivalence relations - Non iterative fuzzy sets - Genetic algorithm - Introduction - Biological background - Traditional optimization and search techniques – Genetic basic concepts

UNIT – II　　NEURAL NETWORKS　　　　　　　　　　　　　　　　　[9]

McCulloch - Pitts neuron - linear reparability - Hebb network - Supervised learning network: perception network - Adaptive linear neuron - Multiple adaptive linear neuron BPN - RBF- TDNN- Associative memory network: auto - Associative memory network - Hetero - Associative memory network - BAM - Hopfield networks - Iterative auto associative memory network & iterative associative memory network - Unsupervised learning networks: Kohonen self - Organizing feature maps - LVQ – CP networks – ART network

UNIT– III　　FUZZY LOGIC　　　　　　　　　　　　　　　　　　　[9]

Membership functions: features - Fuzzification - Methods of membership value assignments - Defuzzification: lambda cuts - methods - Fuzzy arithmetic and fuzzy measures: fuzzy arithmetic - Extension principle - Fuzzy measures - Measures of fuzziness - Fuzzy integrals - Fuzzy rule base and approximate reasoning : truth values and tables - Fuzzy propositions - formation of rules - Decomposition of rules - Aggregation of fuzzy rules - Fuzzy reasoning - Fuzzy inference systems - Overview of fuzzy expert system – Fuzzy decision making

UNIT – IV　　GENETIC ALGORITHM　　　　　　　　　　　　　　　　[9]

Genetic algorithm and search space - General genetic algorithm - Operators - Generational cycle - Stopping condition - constraints - Classification genetic programming - Multilevel optimization - Real life problem - Advances in GA

UNIT – V　　HYBRID SOFT COMPUTING TECHNIQUES & APPLICATIONS　　　[9]

Neuro Fuzzy hybrid systems - Genetic neuro hybrid systems - Genetic fuzzy hybrid and fuzzy genetic hybrid systems - simplified fuzzy ARTMAP - Applications: A fusion approach of multispectral images with SAR - Optimization of traveling salesman problem using genetic algorithm approach - Soft computing based hybrid fuzzy controllers

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Apply various soft computing frame works
CO2: Design of various neural networks
CO3: Comprehend fuzzy logic
CO4: Apply genetic algorithm
CO5: Determine the hybrid soft computing techniques for neuro applications

Text Books :

1　J.S.R.Jang, C.T. Sun and E.Mizutani, Neuro-Fuzzy and Soft Computing, PHI / Pearson Education 2006
2　S.N.Sivanandam and S.N.Deepa, Principles of Soft Computing, Wiley India Pvt Ltd, 2011

Reference Books :

1　S.Rajasekaran and G.A.Vijayalakshmi Pai, Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis & Applications, Prentice-Hall of India Pvt. Ltd., 2006
2　David E. Goldberg, Genetic Algorithm in Search Optimization and Machine Learning Pearson Education, 2013
3　Simon Haykin,Neural Networks Comprehensive Foundation Second Edition, Pearson Education, 2005
4　Timothy J. Ross, Fuzzy Logic with Engineering Applications, Third Edition, John Wiley & Sons, 2010

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER – VIII</u>

18IT871	**C# AND .NET FRAMEWORK**	**L**	**T**	**P**	**C**		
	(ELECTIVE)	**3**	**0**	**0**	**3**		

Prerequisite:

Objective(s):

- *To learn cover all segments of programming in C# starting from the language basis, followed by the object oriented programming concepts*
- *To update and enhance skills in writing Windows applications, ADO.NET and ASP .NET*
- *To introduce advanced topics namely data connectivity, WPF, WCF and WPF with C# and .NET 4.5*
- *To implement mobile applications using .Net Compact Framework*
- *To develop the software using NET technology*

UNIT – I   C# LANGUAGE BASICS   [9]

Net Architecture Core C# - Variables - Data Types - Flow control - Objects and Types - Classes and Structs - Inheritance- Generics – Arrays and Tuples – Operators and Casts – Indexes

UNIT – II   C# ADVANCED FEATURES   [9]

Delegates - Lambdas - Lambda Expressions - Events - Event Publisher - Event Listener - Strings and Regular Expressions – Generics - Collections - Memory Management and Pointers - Errors and Exceptions - Reflection

UNIT – III   BASE CLASS LIBRARIES AND DATA MANIPULATION   [9]

Diagnostics - Tasks - Threads and Synchronization -.Net Security - Localization - Manipulating XML - SAX and DOM - Manipulating files and the Registry - Transactions - ADO.NET- Peer to Peer Networking - PNRP - Building P2P Applications – Windows Presentation Foundation (WPF)

UNIT – IV   WINDOW BASED APPLICATIONS, WCF AND WWF   [9]

Window based applications - Core ASP.NET - ASP.NET Web forms - Windows Communication Foundation (WCF) - Introduction to Web Services - .Net Remoting - Windows Service - Windows Workflow Foundation (WWF) - Activities Workflows

UNIT–V   .NET FRAMEWORK AND COMPACT FRAMEWORK   [9]

Assemblies-Shared assemblies - Custom Hosting with CLR Objects - Appdomains - Core XAML- Bubbling and Tunneling Events - Reading and Writing XAML - .Net Compact Framework - Compact Edition Data Stores - Errors - Testing and Debugging - Optimizing performance - Packaging and Deployment - Networking and Mobile Devices

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: *Develop various applications using C# Language in the .NET Framework*
CO2: *Build distributed application using .NET Framework*
CO3: *Create Mobile Application using .NET compact Framework*
CO4: *Develop the webpage design using .NET Frame work*
CO5: *Discover window based application using .NET Frame work*

Text Books :

1 Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner ,Professional C# 2012 and .NET 4.5, Wiley, 2012
2 Andrew Troelsen,Pro C# 5.0 and the .NET 4.5 Framework, Apress publication, 2012

Reference Books :

1 Ian Gariffiths, Mathew Adams, Jesse Liberty, Programming C# 4.0, O„Reilly, Fourth Edition, 2010

2 Andy Wigley, Daniel Moth, Peter Foot,Mobile Development Handbook, Microsoft Press, 2011
3 Harsh Bhasin,Programming in C#, Oxford University Press, 2014
4 Jung Hyun Han,3D Graphics for Game Programming Chapman and Hall/CRC,1st edition, 2011

K.S.R. COLLEGE OF ENGINEERING (Autonomous) **R 2018**

<u>SEMESTER – VIII</u>

18IT872	NEXT GENERATION NETWORKS	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite:

  Objective(s):

- *To learn the technical, economic and service advantages of next generation networks*
- *To learn the basic architecture of a next generation network (NGN) with reference*
- *To understand NGN services*
- *To learn the role of IP Multimedia Sub–system (IMS), network attachment and admission control functions*
- *To learn and compare the various methods of providing connection–oriented services over a NGN with reference to MPLS, MPLS–TE and T–MPLS*

UNIT – I   INTRODUCTION   **[9]**

Evolution of public mobile services - Motivations for IP based services - Wireless IP network architecture - 3GPP packet data network architecture - Introduction to next generation networks - Changes - Opportunities and Challenges - Technologies - Networks and Services - Next Generation Society - Future Trends

UNIT – II   IMS AND CONVERGENT MANAGEMENT   **[9]**

IMS Architecture - IMS services - QoS Control and Authentication - Network and Service management for NGN - IMS advantages - Next Generation OSS Architecture - Standards important to OSS architecture - Information framework - OSS interaction with IMS - NGN OSS function/ information view reference model - DMTF CIM

UNIT – III   MPLS AND VPN   **[9]**

Technology overview - MPLS & QoS - MPLS services and components - Layer 2 VPN - Layer 2 internetworking - VPN services - Signaling - Layer 3 VPN - Technology overview - Remote Access and IPsec integration with MPLS VPN

UNIT – IV   MULTICAST   **[9]**

MPLS Multicast VPN overview - Applications - Examples - IPv6 and MPLS - Technology overview - Future of MPLS - Integrating IP and optical networks - Future layer 3 services - Future layer 2 services

UNIT – V   NGN MANAGEMENT   **[9]**

Network Management and Provisioning - Configuration - Accounting - Performance - Security - Case study for MPLS - Future enhancements – Adaptive self healing networks

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: *Design routing mechanism meeting the desired QoS in NGN*
CO2: *Design network management protocols in NGN*
CO3: *Compare various methods of providing connection–oriented services over a NGN with reference to MPLS, MPLS–TE and T–MPLS*
CO4: *Compare various NGN virtual network services with reference to VPNs, VLANs,pseudo wires, VPLS and typical applications*
CO5: *Explain about network management and security*

Text Books :

 1 Thomas Plevyak, Veli Sahin Next generation Telecommunication Networks, Services and Managemen, Wiley & IEEE Press Publications, 2011
 2 Ina Minie, Julian Lucek,MPLS enabled Applications - Emerging developments and new technologies, 3rd edition, Wiley 2010

Reference Books :

1 Monique Jeanne Morrow, Azhar Sayeed,Next Generation Networks, CISCO Press, 2000

2 Robert Wood, MPLS and Next Generation Networks: Foundations for NGN and Enterprise Virtualization, CISCO Press, 2006

3 Robet Wood,Next Generation Network Services, Cisco Press, 2006

4 Neill Wilkinson,Next Generation Networks Services, Technologies and Strategies, Wiley 2002

<u>**SEMESTER – VIII**</u>

18IT873	INFORMATION STORAGE AND RETRIEVAL	L	T	P	C
	(ELECTIVE)	3	0	0	3

Prerequisite:

Objective(s):

- *To understand information retrieval process*
- *To understand concepts of clustering and how it is related to Information retrieval*
- *To deal Storage, Organization & Access to Information Items*
- *To evaluate the performance of IR system*
- *To understand information sharing on semantic web*

UNIT – I   INTRODUCTION   [9]

Basic Concepts of IR - Data Retrieval & Information Retrieval - IR system block diagram - Automatic Text Analysis: Luhn's ideas - Conflation Algorithm - Indexing and Index Term Weighing - Probabilistic Indexing - Automatic Classification - Measures of Association - Different Matching Coefficient - Classification Methods - Cluster Hypothesis - Clustering Algorithms - Single Pass Algorithm - Single Link Algorithm - Rocchio's Algorithm

UNIT – II   STORAGE AND SEARCHING TECHNIQUES   [9]

Storage: Inverted file - Suffix trees & suffix arrays - Signature Files- Scatter storage or hash addressing - Clustered files - IR Models: Basic concepts - Boolean Model - Vector Model Searching strategies: Boolean Search - Serial search - cluster based retrieval - Query languages - Types of queries - Patterns matching - Structural queries

UNIT – III   RETRIEVAL PERFORMANCE EVALUATION AND ONTOLOGY   [9]

Performance Evaluation: Precision and recall - Alternative measures Ontology: Ontology based information sharing - Ontology languages for semantic web – Ontology creation

UNIT – IV   DISTRIBUTED AND MULTIMEDIA IR   [9]

Distributed IR: Introduction - Collection Partitioning - Source Selection - Query Processing - Web issues - MULTIMEDIA IR: Introduction- Data Modeling - Query languages - Generic multimedia indexing approach - One dimensional time series - two dimensional color images – Automatic Feature Extraction

UNIT – V   WEB SEARCHING   [9]

Searching the Web: Challenges - Characterizing the Web - Search Engines - Browsing - Mata - Searchers - Web crawlers - Meta - Crawler - Web data mining - Finding needle in the Haystack - Searching using Hyperlinks - Page ranking algorithms

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to

CO1: *Explain information retrieval process*
CO2: *Discuss the concept of clustering and how it is related to Information retrieval*
CO3: *Describe Storage Organization & Access to Information Items*
CO4: *Evaluate the performance of IR system*
CO5: *Discuss information sharing on semantic web*

Text Books :

1   Yates & Neto, Modern Information Retrieval, Pearson Education, ISBN 81-297-0274-6

2   C.J. Rijsbergen, znformation Retrieval, (www.dcs.gla.ac.uk)

Reference Books :

1   Christopher D. Manning, Prabhakar Raghavan and Hinrich Schutze,Introduction to Information Retrieval, Cambridge University Press, ISBN 978-0-521-86571-5

2   Mark leven,Introduction to search engines and web navigation, John Wiley and sons Inc., ISBN 9780-170-52684-2

3   V. S. Subrahamanian, Satish K. Tripathi,Multimedia information System, Kulwer Academic Publisher

4   Chabane Djeraba,Multimedia mining A highway to intelligent multimedia documents , Kulwer Academic Publisher, ISBN 1-4020-7247-3

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

	DISASTER MANAGEMENT	L	T	P	C
18HS094	(Common to CE, CS & IT) (OPEN ELECTIVE)	3	0	0	3

Objective(s):
- *To understand the students to learn about the aspects of disaster and risk management.*
- *To understand the different types of Disaster.*
- *To know the different kinds disaster relief Organization*
- *To study the Disaster policy in India*
- *To create the awareness about disaster Management*

UNIT – I   INTRODUCTION ABOUT DISASTER   [9]

Introduction - Nature and Dimension of the challenge - Linking Disaster and Development - Sustainable development - Disruption of development by disasters - Causes of Disasters - Development opportunities afforded by disasters - Varied impact on states in India. HAZARDS - Definition - Principles - Impact of Disasters - Levels of Disaster - Effect of Disasters – Causal factors – Phases of Disaster

UNIT –II   DIFFERENT TYPES OF DISASTERS   [9]

Different calamities - Typology of Disasters: Earthquakes - Tsunamis - Volcanoes - Landslides Tropical cyclones - Floods - Environmental pollution - Deforestation - Desertification - Pest Infestations - Epidemics - Chemical and industrial accidents - Trends in climatology - Meteorology and hydrology - Seismic activity - Case Study.

UNIT – III   DISASTER PREVENTION AND CONTROL   [9]

United Nations Disaster Relief Coordinator (UNDRO): Disaster relief and management - Prevention - Preparedness - Stand by capacity - Coordination - Cooperation and leadership Continuum from relief to rehabilitation and development – Checklists and reporting formats by UNDMT and international emergency assistance requirement

UNIT – IV   DISASTER MANAGEMENT IN INDIA   [9]

Issues - National policy - Historical Framework - Funding mechanisms - Calamity Relief Fund (CRF) - The Disaster management Act 2005 - Indian Agencies for disaster management - National Civil Defense Organization

UNIT – V   DISASTER PREPAREDNESS AND PLANNING   [9]

Introduction - Objectives - Disaster planning, Strategies for disaster preparedness and planning - Principles, Myths, Factors influencing disaster risk - Assessing risk in a context of uncertainty - Disaster insurance - Use of the media in information dissemination - Types of media and their information needs

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: *Explain the nature and causes of disaster*
CO2: *Describe the Various risk and take steps to mitigate various types of disaster*
CO3: *Illustrate the various Disaster prevention and control methods*
CO4: *Describe the Various policies and act in Management in India*
CO5: *Explain recent strategies towards disasters preparedness and planning.*

Text Books :

1. Satish Modh, Introduction to Disaster Management, Macmillian publishers india ltd, New delhi, Second Edition, 2019

2. PardeepSahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, Fourth Edition 2018

Reference Books :

1. M. Saravanakumar, Disaster Management, Himalaya Publishing House,New Delhi, Second Edition, 2017

2. Singh, Disaster Management: Future Challenges, IK International, New Delhi, Second Edition ,2017

3. Arvind Kumar Disaster Management - Recent Approaches Anmol Publications, New Delhi, First Edition , 2016

4. SathishModh, Introduction to Disaster Management, Macmillan, New Delhi,Seventh Edition, 2014

K.S.R. COLLEGE OF ENGINEERING (Autonomous)				R 2018

	ANALOG AND DIGITAL COMMUNICATION	**L**	**T**	**P**	**C**
18EC093	(Common to EE & IT)				
	(OPEN ELECTIVE)	**3**	**0**	**0**	**3**

Prerequisite: *No prerequisites needed for enrolling into the course.*

Objectives:

- *To understand different types of analog modulation techniques*
- *To understand different types of digital modulation techniques*
- *To gain knowledge of Digital transmission techniques*
- *To familiarize different data communication techniques*
- *To understand the basics of spread spectrum and multiple access techniques.*

UNIT – I   ANALOG COMMUNICATION   [9]

Introduction - Modulation and demodulation - Types of analog modulation - AM envelope - Calculation of modulation index - AM frequency spectrum - Bandwidth - Voltage distribution and power distribution - Angle modulation - FM and PM waveforms - Phase deviation and frequency deviation - Modulation index - Frequency analysis and bandwidth requirement of angle modulated waves

UNIT – II   DIGITAL MODULATION TECHNIQUES   [9]

Introduction - Shannon"s information capacity theorem - Amplitude shift keying - Frequency shift keying - Phase shift keying - Binary phase shift keying - Differential BPSK - QPSK - Bandwidth efficiency - Carrier recovery methods - Squaring loop and cost as loop.

UNIT – III   DIGITAL TRANSMISSION   [9]

Introduction - Pulse modulation - PCM - PCM sampling, sampling rate - Signal to quantization noise ratio - Compounding: Analog and Digital - Percentage error - Delta modulation - Adaptive delta modulation - DPCM - Inter symbol interference and eye patterns.

UNIT – IV   DATA COMMUNICATIONS   [9]

History of data communications - Standards organizations for data communication - Data communication circuits - Data communication codes - Error control - Error detection - Error correction - Data communication Hardware - Serial interfaces - Data modems - Asynchronous modem - Synchronous modem - Low speed modem - Medium and high speed modem - Modem control.

UNIT – V   SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES   [9]

Introduction - Pseudo noise sequences - PN sequence generation - DS spread spectrum with coherent binary PSK - Processing gain - FH spread spectrum - Multiple access techniques - Wireless communication - TDMA and CDMA in wireless communication systems.

Total = 45 periods

Course Outcomes: On completion of this course, the student will be able to
CO1: *Outline the concepts of Analog communication techniques*
CO2: *Outline the concepts of Digital communication and different types of digital shift keying*
CO3: *Describe the concepts of Digital transmission techniques*
CO4: *Illustrate the concepts of Data communication techniques*
CO5:*Describe spread spectrum and multiple access techniques*

Text Books :

1 Wayne Tomasi, Advanced Electronic Communication Systems, Pearson Education, US, Fifth Edition, Reprint 2013.

2 B.P.Lathi, Zhi Ding, Modern Digital and Analog Communication systems, Oxford University Press, New Delhi, Fourth Edition, 2010.

Reference Books :

1 H.Taub, D.L.Schilling, G.Saha,Principles of Communication, Tata McGraw Hill, New Delhi, Third Edition, 2007.

2 Simon Haykin, Communication Systems, John Wiley & Sons, New York, Fifth Edition, Reprint 2012.

3 R.Blake, Electronic Communication Systems, Thomson Delmar Publications, Second Edition, 2002.

4 B.Sklar, Digital Communication Fundamentals and Applications, Pearson Education, USA, Second Edition, 2007.

18ME776	**INDUSTRIAL ROBOTICS**	L	T	P	C
	(Common to CS, IT & ME)				
	(OPEN ELECTIVE)	3	0	0	3

Prerequisite : *Computer Aided Manufacturing.*

Objectives

- *To study the fundamentals of industrial robotics*
- *To learn the concepts of Robot drive systems and end effectors*
- *To acquire the Knowledge on sensors and machine vision*
- *To explore the robot kinematics and its programming*
- *To implement the robot applications in industrial environment*

UNIT – I   FUNDAMENTALS OF ROBOTICS   [9]

Robot - Definition - Robot Anatomy - Co-ordinate Systems - Work Envelope - Types and classification - Specifications - Pitch - Yaw - Roll - Joint Notations - Speed of Motion - Pay Load - Robot Parts and Their Functions - Need for Robots - Different Applications

UNIT – II   ROBOT DRIVE SYSTEMS AND END EFFECTORS   [9]

Pneumatic Drives - Hydraulic Drives - Mechanical Drives - Electrical Drives - D.C. Servo Motors - Stepper Motor - A.C. Servo Motors - Salient Features - Applications and Comparison of all these Drives - End Effectors - Grippers - Mechanical Grippers - Pneumatic and Hydraulic Grippers - Magnetic Grippers - Vacuum Grippers - Two Fingered and Three Fingered Grippers - Internal Grippers and External Grippers - Selection and Design Considerations

UNIT – III   SENSORS AND MACHINE VISION   [9]

Requirements of a sensor - Principles and Applications of the following types of sensors - Position sensors - Piezo Electric Sensor - LVDT - Resolvers - Optical Encoders - Pneumatic Position Sensors - Range Sensors -Triangulation Principle - Structured - Lighting Approach - Time of Flight Range Finders - Laser Range Meters - Proximity Sensors - Inductive - Hall Effect - Capacitive - Ultrasonic and Optical Proximity Sensors - Touch Sensors - Binary Sensors- Analog Sensors - Wrist Sensors- Compliance Sensors - Slip Sensors. Camera - Frame Grabber- Sensing and Digitizing Image Data - Signal Conversion - Image Storage - Lighting Techniques. Image Processing and Analysis - Data Reduction - Segmentation- Feature Extraction - Object Recognition - Other Algorithms. Applications - Inspection - Identification, Visual Serving and Navigation

UNIT – IV   ROBOT KINEMATICS AND ROBOT PROGRAMMING   [9]

Forward Kinematics - Inverse Kinematics and Differences - Forward Kinematics and Reverse Kinematics of Manipulators with Two - Three Degrees of Freedom (In 2 Dimensional) - Four Degrees of Freedom (In 3 Dimensional) - DH matrices - Deviations and Problems. Teach Pendant Programming- Lead through programming- Robot programming Languages - VAL Programming - Motion Commands - Sensor Commands - End effecter commands and Simple Programs

UNIT – V   IMPLEMENTATION AND ROBOT ECONOMICS   [9]

RGV- AGV-Implementation of Robots in Industries -- Various Steps - Safety Considerations for Robot Operations - Economic Analysis of Robots - Pay back Method - EUAC Method - Rate of Return Method

Total = 45 Periods

Course Outcomes: On completion of this course, the students will be able to
   CO1: Explore the working principle and configuration of industrial robots
   CO2: Apply the concepts of Robot drive systems and end effectors
   CO3: Investigate the applications of sensors and machine vision. system
   CO4: Design the robot kinematics and its programming
   CO5: Examine the robots in industrial applications and evaluate the economics

Text Books:
1. M.P.Groover, Industrial Robotics - Technology, Programming and Applications, McGraw-Hill, Delhi, Second Edition, 2015.
2. Yoram Koren, Robotics for Engineers, McGraw-Hill Book Co., Delhi, Second Edition, 2019.

Reference Books:
1. Fu.K.S. Gonzalz.R.C., and Lee C.S.G., Robotics Control, Sensing, Vision and Intelligence, McGraw-Hill Book Co., Delhi, Second Edition, 1987.
2. Janakiraman.P.A., Robotics and Image Processing, Tata McGraw-Hill, New Delhi, Second Edition, 2013.
3. Mittal R. K. and Nagrath, I. J. ,Robotics and Control, Tata McGraw Hill Publishing Company Limited, New Delhi, Second Edition,2004.
4. Peter Corke, Robotics, Vision and Control: Fundamental Algorithms in MATLAB" , Springer, Third Edition,2009

R 2018

<table>
<tr><td rowspan="3">**18CE091**</td><td>**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**
BASIC CIVIL AND MECHANICAL ENGINEERING
(Common to CS, EE & IT)
(OPEN ELECTIVE)</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td></td><td>3</td><td>0</td><td>0</td><td>3</td></tr>
</table>

Prerequisite: -

Objective(s):
- *To introduce surveying and civil engineering materials*
- *To illustrate building components and structures*
- *To describe the various types of power plants and its working principles*
- *To provide knowledge on types of IC Engines and its working principles*
- *To illustrate refrigeration and air conditioning systems*

UNIT – I   SURVEYING AND CIVIL ENGINEERING MATERIALS   [9]

Surveying: Objects - Types - Classification - Principles - Measurements of Distances - Angles - Leveling - Determination of Areas - Illustrative Examples. Civil Engineering Materials: Bricks - Stones - Sand - Cement - Concrete - Steel Sections

UNIT – II   BUILDING COMPONENTS AND STRUCTURES   [9]

Foundations: Types, Bearing Capacity - Requirement of Good Foundations - Superstructure - Types of Bridges and Dams - Brick Masonry - Stone Masonry - Beams - Columns - Lintels - Roofing - Flooring - Plastering - Mechanics - Internal and External Forces – Stress – Strain – Elasticity

UNIT – III   POWER PLANT ENGINEERING   [9]

Introduction, classification of power plants - Working principles of steam - Gas - Diesel - Hydro-electric and Nuclear power plants - Merits and demerits - Pumps and Turbines - Working principles of Reciprocating pumps (single acting and double acting) – Centrifugal pump

UNIT – IV   IC ENGINES   [9]

Internal combustion engine as automobile power plant - Working principle of Petrol and Diesel Engines - Four stroke and Two stroke cycles - Comparison of four stroke and two stroke engines

UNIT – V   REFRIGERATION AND AIR CONDITIONING SYSTEM   [9]

Terminology of Refrigeration and Air Conditioning - Principle of vapour compression and absorption system - Layout of typical domestic - Refrigerator - Window and Split type room Air Conditioner

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Calculate the areas, volumes and relative positions of the object and to gain knowledge about the various materials used in construction.

CO2: Describe construction practices and the components of the structures.

CO3: Identify the working principle of various types of power plants, pumps and turbines.

CO4: Summarize the various classification and terminologies of engines, such as two stroke and four stroke petrol and diesel engines.

CO5: Demonstrate refrigeration process and also the working principle of various types of Air Conditioners.

Text Books :

1   Ramesh Babu V., Basic Civil and Mechanical Engineering, VRB Publishers, Chennai, First Edition, 2017
2   Shanmugam G and Palanichamy M S., Basic Civil and Mechanical Engineering, McGraw Hill Education Private Ltd, Chennai ,First Edition, 2018

Reference Books :

1   Ramamrutham S., Basic Civil Engineering, Dhanpatrai Publishing Co.(P) Ltd., Third Edition, New Delhi,2013
2   Venugopal K and Prahu Raja V., Basic Mechanical Engineering, Nibras Publishers, First Edition, Chennai, 2018
3   Shantha Kumar S.R.J., Basic Mechanical Engineering, Hi-tech Publications, Mayiladuthurai, First Edition, 2016
4   https://nptel.ac.in/courses/105/102/105102088/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)			R 2018	

18HS098

HUMAN RESOURCE MANAGEMENT
(Common to CS & IT)
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

Objective(s):
- *To enable the students to understand the various HR functions in-depth*
- *To familiarize students with contemporary practices*
- *To study the various tool and techniques of HR ethical manner*
- *To enable the students to understand the challenges in domestic and IHRM*
- *To manage the manpower to attract , motivate and attract them to retain the organization*

UNIT – I   INTRODUCTION   [9]

Nature and Scope of Human Resource Management (HRM) - Meaning and Definition of HRM - Objectives and Functions of HRM – Models of HRM – HR policies – HRM in the changing environment.

UNIT – II   STAFFING   [9]

Human Resource Planning - Job Analysis - Job Description - Job Specification - Recruitment - Selection - Induction - Placement - Social networking

UNIT – III   TRAININGANDEXECUTIVEDEVELOPMEN   [9]

Types of training methods - Purpose - Benefits & resistance - Executive Development Programmes - Benefits - Self Development – Knowledge Management – Case study

UNIT – IV   INTERNATIONAL HRM   [9]

Domestic versus international Human Resource management - Perspective and practices of International Human Resource Management - Competencies required for International Managers - Changing roles of HR during the transition from Local to Global.

UNIT – V   PERFORMANCEEVALUATION ANDCONTROLPROCESS   [9]

Compensation plan - Reward - Motivation - Method of Performance Evaluation - Feedback - Industry practices. Promotion - Demotion - Transfer and Separation -Implication of job change - The control process - Importance - Methods - Requirement of effective control systems grievances - Causes - Implications - Redressal methods

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to:
CO1: *Describe the Various policies and systems for all HR sub-functions.*
CO2: *Analyze the factors to deal with multi-cultural workforce.*
CO3: *Estimate the training methods for developing workforce to meet dynamic environment.*
CO4: *Explain the performance of workforce in organization.*
CO5: *Illustrate the different competencies required for managing global workforce.*

Text Books :

1. K.Aswathappa, Human Resource and Personnel Management- Text and Cases, Tata McGraw Hill, New Delhi, Eighth Edition, 2016

2. BiswajeetPattanayak, Human Resource Management, Prentice Hall of India, New Delhi, Fourth Edition, 2015.

Reference Books :

1. Gary Dessler,Human Resource Management, Prentice Hall of India, New Delhi, Fifth Edition, 2013.
2. Bernardin H John, Human Resource Management-An experiential Approach, Tata McGraw Hill, New Delhi, Third Edition, 2015
3. Luis R.Gomez-Mejia, David B.Balkin, Robert L Cardy, Managing Human Resource, PHI Learning, New Delhi, 2014
4. EugenceMckenna and Nic Beach, Human Resource Management, Pearson Education Limited, New Delhi, 2012.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)			R 2018	

18HS095

ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING
(Common to CS, EE & IT)
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

Objective(s):

- To understand the concept of managerial economics for effective management decision making
- To identify the various functions of demand and supply
- To analyze the production and cost functions for estimation of cost.
- To evaluate the various determinants of pricing and its methods
- To study the financial analysis for effective decision making in investment

UNIT – I   INTRODUCTION   [9]

Managerial Economics - Relationship with other disciplines - Firms: Types - Objectives and goals - Managerial decisions: Types and Process

UNIT – II   DEMAND & SUPPLY ANALYSIS   [9]

Demand: Types of demand - Determinants of demand - Demand function - Demand elasticity and Demand forecasting - Supply: Determinants of supply - Supply function and Supply elasticity

UNIT – III   PRODUCTION AND COST ANALYSIS   [9]

Production function: Returns to scale - Production optimization - Least cost input and Iso quants - Managerial uses of production function. Cost Concepts: Cost function - Determinants of cost - Short run - Long run cost curves and Estimation of Cost

UNIT – IV   PRICING   [9]

Pricing : Meaning - Definition - Determinants of Price - Pricing under different objectives - Market Structures: Perfect Competition - Monopoly - Monopolistic Competition and Oligopoly and Price discrimination Pricing methods in practice

UNIT – V   FINANCIAL & CAPITAL (ELEMENTARY TREATMENT)   [9]

Balance sheet and related concepts - Profit & Loss Statement and related concepts - Financial Ratio Analysis Investments - Risks and return evaluation of investment decision - Average rate of return - Payback Period - Net Present Value – Internal rate of return

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Describe the concept and goals of Managerial economics
CO2: Illustrate the knowledge of forecasting the demand and supply in the management
CO3: Analyze the price discrimination of the product among the competitors
CO4: Explain the market structure for determining the pricing methods
CO5: Estimate the Financial statements to understand the return on Investment

Text Books :

1. A. Ramachandra Aryasri and V. V. Ramana Murthy, Engineering Economics and Financial Accounting, Tata Mc-Graw Hill, New Delhi, Fourteenth Reprint,2016.

2. R.L. Varshney and K.L. Maheswari,Managerial Economics, Sultan Chand & Sons, Twenty First Edition. 2015

Reference Books :

1. A. Samuelson Paul and W.D. Nordhaus, Economics, Tata McGraw-Hill, New Delhi, Twenty Edition,2014.

2. McGuigan, Moyer and Harris, Managerial Economics : Applications, Strategy and Tactics, Thomson South Western,Tenth Edition, 2016.

3. Paresh Shah, Basic Financial Accounting for Management, Oxford University Press,New Delhi, Seventh Edition, 2015.

4. Nordhaus and Samuelson, " Economics", Tata McGraw- Hill, New Delhi, Twenty Edition,2014

K.S.R. COLLEGE OF ENGINEERING (Autonomous)					R 2018

	MEDICAL ELECTRONICS	L	T	P	C
18EC662	(Common to CS, EC & IT) (OPEN ELECTIVE)	3	0	0	3

Prerequisite: *No prerequisite needed for enrolling into the course*

Objectives:

- *To learn the methods of recording various bio-potentials.*
- *To understand the design and working of various diagnostic equipment.*
- *To be familiar with the design and working of various therapeutic equipment.*
- *To expose the principles and working behind various imaging techniques.*
- *To gain knowledge about the recent trends in medical instrumentation.*

UNIT – I   ELECTRO-PHYSIOLOGY AND BIO-POTENTIAL RECORDING   [9]

The origin of bio potentials - Bio potential electrodes - Carrier - chopper and isolation amplifiers -Transducers for biomedical applications: Strain gauge - Piezoelectric transducer - Thermocouple - Thermistor - Biosensors - ECG - EEG - EMG - PCG - ERG and EOG: Lead systems - Recording methods - Typical waveforms and signal characteristics

UNIT – II   BIO-CHEMICAL AND NON ELECTRICAL PARAMETER MEASUREMENT   [9]

Blood gas analyzers - Electrophoresis - Colorimeter & Photometer - Auto analyzer - Blood flow meter - Cardiac output - Respiratory measurement - Blood pressure measurement - Temperature measurement - Pulse measurement - Blood cell counters: Coulter counters

UNIT – III   THERAPEUTIC EQUIPMENT   [9]

Cardiac pacemakers - DC defibrillator - Dialyzers - Surgical diathermy - Physiotherapy and electrotherapy equipment - Oxygenators – Heart lung machine

UNIT – IV   MEDICAL IMAGING   [9]

X-Ray - Computer axial tomography - Positron emission tomography - MRI and NMR - Ultrasonic imaging systems

UNIT -- V   RECENT TRENDS IN MEDICAL INSTRUMENTATION   [9]

Thermograph - Endoscopy unit - LASER in medicine - Biomedical telemetry - Radio-pill - Cardiac catheterization laboratory – Electrical safety of medical equipment

Total = 45 Periods

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

CO1   Describe the recording methods of various bio-potential
CO2   Interpret various measurements of bio-chemical and non-electrical parameter
CO3   Explain different types of therapeutic equipment.
CO4   Discuss the principles of various medical imaging modalities
CO5   Describe the recent trends in medical instrumentation

Text Books :

1   R.S.Khandpur, Handbook of Biomedical Instrumentation, Tata McGraw Hill, Noida, Third Edition, 2014.

2   Leslie Cromwel, Fred J.Weibel, Erich A.Pfeiffer, Biomedical Instrumentation and Measurements, Pearson/Prentice Hall India, New Delhi, Second Edition, 2011.

Reference Books :

1   John G.Webster, Medical Instrumentation Application and Design, John Wiley & Sons Inc, United States, Fourth Edition, 2010.

2   Joseph J.Carr and John M.Brown, Introduction to Biomedical Equipment Technology, John Wiley &Sons, United States, Fourth Edition, 2008.

3   M. Arumugam, Biomedical Instrumentation, Anuradha Publications, Chennai, Second Edition, Reprint 2009.

4   R.L. Reka& C. Ravikumar, Biomedical Instrumentation/ Medical Electronics, Lakshmi Publications, Chennai, Second Edition, Reprint 2010.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)				R 2018

		L	T	P	C
18CE096	**SOLID WASTE MANAGEMENT** (Common to CS & IT) (**OPEN ELECTIVE**)	3	0	0	3

Prerequisite: -

Objective(s):
- *To introduce technical aspects of environment.*
- *To describe the components of municipal solid waste management and waste characterization*
- *To discuss the solid waste collection systems, and processing of solid wastes.*
- *To illustrate the different methods of treatment of solid waste management.*
- *To describe various disposal methods of solid waste management.*

UNIT – I   INTRODUCTION TO ENVIRONMENT   [9]

Ecosystem - Meaning - Types - Components - Structure - Functions, levels of organization in nature - Food chain and trophic structure – Biogeochemical cycles – Energy flow

UNIT – II   MUNICIPAL SOLID WASTE   [9]

Definition - Sources and types of solid waste-composition and its determinants of solid waste - Factors influencing generation - Quantity assessment of solid wastes - Methods of sampling and characterization

UNIT – III   COLLECTION AND TRANSFER   [9]

Collection: Collection of solid waste - Collection system, equipments - Factors affecting collection - Collection routes - Preparation of master schedules -Transfer and Transport: Need for transfer operation - Transfer stations - Types - transport means and methods - Location of transport stations - Manpower requirement - Collection routes: Transfer stations - Selection of location, types & design requirements, operation & maintenance

UNIT – IV   TREATMENT METHODS   [9]

Various methods of refuse processing - Recovery - Recycle and reuse, composting - Aerobic and anaerobic - Incineration - Pyrolysis and energy recovery.

UNIT – V   DISPOSAL METHODS   [9]

Impacts of open dumping - Site selection - Sanitary land filling - Design criteria and design examples - Leach ate and gas collection systems – leach ate treatment

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
CO1: Discuss and analyze technical aspects of environment
CO2: Examine the sources solid waste, methods of sampling and characterization of solid waste
CO3: Select the appropriate method for solid waste collection and transportation processing
CO4: Evaluate treatment methods according to properties of municipal solid waste
CO5: Examine various disposal methods according to properties of municipal solid waste

Text Books :

1   Bhatt, M. S. and AsherfIlliyan., Solid Waste Management, Synergy Books India, New Delhi, First Edition, 2012

2   Williams, Paul T., Waste Treatment and Disposal, John Wiley and Sons, Hoboken, First Edition, 2005

Reference Books :

1   Vesiland, A., Solid Waste Engineering, Thompson Books, Singapore, First Edition, 2002

2   Tchobanoglous, G. Frank Kreith., Hand Book of Solid Waste Management, McGraw-Hill, Inc, New York, Second Edition, 2002

3   Manual on Municipal Solid Waste Management, CPHEEO, Ministry of Urban Development, Govt. of. India, New Delhi, 2000

4   https://nptel.ac.in/courses/105/106/105106056/

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

18ME097	INDUSTRIAL SAFETY ENGINEERING	L	T	P	C
	(Common to CS & IT)	3	0	0	3
	(OPEN ELECTIVE)				

Prerequisites : *No Pre requisite needed in this course*

Objectives:
- *To study the importance of personal and industrial safety hazards in industry*
- *To explore the safety aspect of industrial machines.*
- *To demonstrate the Safety measures in welding and gas handling equipments*
- *To apply health and welfare measures during inspection and testing of industrial environment*
- *To estimate the hazardous and risks in industries through various techniques*

UNIT – I   INTRODUCTION   [9]

Concepts of safety - Hazard classification - Chemical, physical, mechanical, ergonomics, biological and noise hazards - Fire properties - Solid, liquid and gases - Fire chemistry and its control - First aid - Cardio pulmonary resuscitation (CPR) - Personal protection

UNIT – II   SAFETY IN MAINTENANCE OF MACHINES   [9]

Basic principle of machine guarding during maintenance - Machine guarding- Types- Fixed guard- Interlock guard- automatic guard - Trip guard Electron eye - Positional control guard - Fixed guard fencing - Guard construction - Guard opening - Lathe - Drilling - Boring - Milling - Grinding - Shaping - Sawing - Shearing - Presses - Forge hammer - Flywheels - Shafts - Couplings - Gears - Sprockets wheels and chains - Pulleys and belts - Authorized entry to hazardous installations – Benefits of good guarding systems

UNIT – III   SAFETY IN WELDING AND GAS CUTTING   [9]

Gas welding and oxygen cutting, resistances welding, arc welding and cutting - Common hazards - Training, safety precautions in brazing, soldering and metalizing - Explosive welding, selection, care and maintenance of the associated equipment and instruments - Safety in generation, distribution and handling of industrial gases - Colour coding - Leak detection-pipe line safety- Storage and handling of gas cylinders

UNIT – IV   SAFETY IN INSPECTION AND TESTING   [9]

Heat treatment operations - Electro plating - Paint shops - Sand and shot blasting - Safety in inspection and testing- Hydro testing - Valves - Boiler drums and headers - Pressure vessels - Air leak test - Steam testing - Safety in radiography - Personal monitoring devices - Radiation hazards - Engineering and administrative controls - Health and welfare measures in engineering industry

UNIT – V   HAZARD ANALYSIS AND RISK MANAGEMENT   [9]

Hazard identification and control - HAZOP, job safety analysis - Fault tree analysis - Event tree analysis - Failure modes and effect analysis - Safety audit - Safety survey - Plant inspection - Past accident analysis - Overall risk analysis - Disasters management plan - Emergency planning - Onsite and offsite emergency planning - Risk management

Total = 45 Periods

Course Outcomes: On completion of this course, the students will be able to
CO1: Identify the safety and hazards risk for personal and industrial environment
CO2: Apply safety aspects to industrial machine functional environments
CO3: Construct the Safety measures in welding and gas handling equipments
CO4: Demonstrate the health and hazardous risk in inspection and testing in industry
CO5: Evaluate hazard and risks using various techniques in industries

Text Books:

1   Blake, R.P., Industrial Safety, PHI Publications, New Delhi, Second Edition, 2000
2   Raghavan, K.V. and Khan A.A., Methodologies in Hazard Identification and Risk Assessment Manual by CLRI, Second Edition, 2019

References:

1   Lees, F.P., Loss Prevention in Process Industries, Butterworth Heinemann, Second Edition, 1996

2   Health and safety in welding and allied processes, welding Institute Hi tech publishing Limited, UK, 1989.

3   Major hazard control - A practical manual, ILO, Jeneva,1988

4   Krishnan, N.V., Safety management in industry, Jaico publishing house, Bombay, 1977

	CONTROL SYSTEMS	L	T	P	C
18EE413	(Common to EE & IT) (OPEN ELECTIVE)	3	1	0	4

Prerequisite: Applied Mathematics

Objectives:

- *To realize the representation of systems and obtain transfer function models.*
- *To provide adequate knowledge in the time response of systems.*
- *To accord basic knowledge of the frequency domain analysis of control systems.*
- *To recognize the concept of stability and its analysis.*
- *To design the compensator and controller for various networks.*

UNIT – I   SYSTEM AND THEIR REPRESENTATION   [12]

Basic elements in control system - Types of system - Open and closed loop systems - Electrical analogous of mechanical translational and rotational system -Thermal system - Transfer function - AC and DC servomotors - Block diagram reduction techniques – Signal flow graphs

UNIT – II   TIME RESPONSE ANALYSIS   [12]

Types of test signal - First and second order time response - Time domain specification of second order under damped systems - Types and Order of systems - Generalized error series - Steady state error and error constants

UNIT – III   FREQUENCY RESPONSE ANALYSIS   [12]

Frequency response of the system - Bode plot - Polar plot - Constant M and N circles - Determination of closed loop response from open loop response - Correlation between frequency and time response

UNIT -- IV   STABILITY OF CONTROL SYSTEM   [12]

Characteristics equation - Routh Hurwitz criterion - Root locus construction - Nyquist stability criterion - Effect of pole, zero addition

UNIT – V   COMPENSATOR AND CONTROLLER DESIGN   [12]

Performance criteria - Lag, lead and lag-lead networks - Compensator design using bode plots - P, PI, PID controllers

Total (L:45 T:15) = 60 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Obtain the transfer function of basic elements, servo motors
CO2: Determine the time-domain response of first and second order systems
CO3: Find the stability of the open loop systems using bode / polar plot
CO4: Examine the stability of the system by the Root locus, Nyquist stability and Routh Hurwitz criterion
CO5: Design lag, lead, lag-lead compensator using bode plot

Text Books :

1 J. Nagrath and M. Gopal, Control Systems Engineering, New Age International (p) Limited, Publishers, 4th Edition, 2006
2 Benjamin C. Kuo, Automatic Control systems, PHI Learning, Seventh Edition, 2009

Reference Books :

1 K. Ogata, Modern Control Engineering, 5th edition, PHI, New Delhi, 2009
2 Norman S. Nise, Control Systems Engineering, 7th Edition, John Wiley, New Delhi, 2014
3 SmarajitGhosh, Control systems, Pearson Education, New Delhi, 2nd Edition, 2009
4 D.Roychoudhury, Modern control engineering, Prentice Hall of India, 2nd Edition, 2005
5 K. Ogata, Modern Control Engineering, 5th edition, PHI, New Delhi, 2009
6 B S Manke, Linear Control Systems with MATLAB Applications, Khanna publishers, 11th Edition, 2012

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2016

18EC763

FUNDAMENTALS OF NANO ELECTRONICS
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

Prerequisite: No prerequisites are needed for enrolling into the course.

Objectives:

- *To learn the evolution of Nanotechnology*
- *To understand the different diversity techniques in Nano systems*
- *To familiarize the different types of Nano particles and its characterization*
- *To familiarize the application of Nano technology in biotechnology*
- *To gain knowledge about the uses of Nano technology in industrial applications*

UNIT – I   INTRODUCTION   **[9]**

Nano science - Evolution - Electron microscopes - Scanning probe microscopes - Optical microscopes for Nanotechnology – X ray diffraction – Associated techniques.

UNIT – II   DIVERSITY IN NANO SYSTEMS   **[9]**

Fullerenes - Synthesis and purification - Mass spectrometry and ion/molecule reactions - Chemistry of fullerenes - Endo hedral chemistry - Conductivity and super conductivity in doped fullerenes - Carbon Nano tubes - Synthesis and purification - Electronic structure - Transport - Mechanical - Physical properties applications - Semiconductor quantum dots – Synthesis and applications.

UNIT– III   METAL NANO PARTICLES AND NANO SHELLS   **[9]**

Method of preparation - Characterization - Functions and applications - Core shell Nano particles: Types of system - Characterization - Functions and applications - Nano shells: Types, characterization, properties and applications.

UNIT – IV   EVOLVING INTERFACES IN NANO   **[9]**

Nano biology - Interaction between bio molecules and Nano particle surfaces - Applications of Nano in biology - Microprobes for medical diagnosis and biotechnology - Current status - Nano sensors - Order from chaos - Applications - Smart dust sensors - Nano medicines various kinds - Future directions.

UNIT – V   IMPACT OF NANOTECHNOLOGY ON SOCIETY   **[9]**

Introduction - Industrial revolution to Nano revolution - Implications of Nano sciences and Nano technology on society - Issues - Nano policies and institutions - Nanotech and war - Nano arms race - Harnessing Nano technology for economicand social development.

Total = 45 Periods

Course Outcomes: On completion of this course, the student will be able to

CO1: Describe the evolution and associated techniques of Nano science

CO2: Interpret the diversities in Nano systems

CO3: Illustrate of Nano particles, shells and their Characterization

CO4: Describe the importance of nanotechnology in biotechnology

CO5: Outline the applications of nanotechnology in industry and society

Text Books :

1. Pradeep T,Nano: The Essentials, Understanding Nano Science and Nano technology, Tata Mcgraw Hill, New Delhi, First Edition, 2007
2. Mick Wilson, Kamali Kannargare., Geoff Smith, Nano technology: Basic Science and Emerging technologies, Overseas Press, New York, First Edition, 2005

Reference Books :

1. Nalwa H S, Encyclopedia of Nanoscience and Nanotechnology, Vol1-10, American Scientific Publishers, New York, 2004.
2. Rao C N R and Govindaraj A, Nanotubes and Nanowires, Royal Society of Chemistry, London, 2005
3. Richard A L Jones, Soft Machines: Nanotechnology and Life, Oxford University Press, Boston, 2008
4. Charles P. Poole, Frank J. Owens, Introduction to Nanotechnology, Wiley Inter science, New York, 2003
5. Mark A. Ratner, Daniel Ratner, Nanotechnology: A gentle introduction to the next Big Idea, Pearson Education, New Delhi, 2003

K.S.R. COLLEGE OF ENGINEERING (Autonomous)		R 2018

PRINCIPLES OF MANAGEMENT

18HS001

(Common to All Branches)
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

Objective(s):
- *To explain the historical background and fundamentals of management thought.*
- *To discuss about various concepts of planning.*
- *To describe the various concepts of Organizational structure.*
- *To illustrate the various management leadership concepts.*
- *To develop the emerging concepts of management though and philosophy*

UNIT – I   OVERVIEW OF MANAGEMENT   [9]

Definition of Management - Importance of management - Management functions - Levels of management - Role of managers - Management a science or an art - Evolution of Management thought: Scientific management and Administrative Principles of management - Ethical issues in Management.

UNIT – II   PLANNING   [9]

Planning: Meaning, purpose, Steps and Types of Plans - Management by objectives (MBO) - Decision Making: Types of Decisions - Steps in Rational Decision making - Common difficulties in Management Decision Making.

UNIT – III   ORGANISING   [9]

Nature and purpose of organizing : Organization structure, Process and Principles of organizing - Line & Staff authority - Departmentation - Span of Control - Centralization and Decentralization - Delegation of authority - Staffing : Sources of Recruitment, Selection process - Training methods - Performance appraisal methods.

UNIT– IV   DIRECTING   [9]

Creativity and Innovation - Motivation and Satisfaction: Motivation Theories - Leadership: Leadership theories and Styles - Communication: Barriers to communication - Principles of effective Communication

UNIT– V   CONTROLLING   [9]

Steps in a control Process: Need for control system - Budgetary and Non-Budgetary control techniques - Problems of the control system - Essentials of effective control system - and Benefits of control.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
- *CO1: Explain the fundamentals of Management thoughts and the conceptual frame work of Management*
- *CO2: Discuss the various concepts of planning, MBO and Strategy to help solving managerial problems*
- *CO3: Explain the concepts of organizing, Delegation and Decision making.*
- *CO4: Describe the management concepts and styles in Leading.*
- *CO5: Illustrate the various controlling and emerging concepts in management thought and philosophy*

Text Books :

1. L.M.Prasad, Principles and Practices of Management, Sultan Chand & Sons, New Delhi, Eleventh Edition, 2015
2. P.C.Tripathi and Reddy Principles of Management, McGraw Hill , New Delhi, Eighth Edition,2015

Reference Books :

1. Hellriegel, Slocum & Jackson, Management A Competency Based Approach, Thomson South Western, London, Fifteenth Edition, 2017
2. Harold Koontz, Heinz Weihrich and mark V Cannice, Management - A Global Entrepreneurial Perspective, Tata McGraw Hill, New Delhi, Twelveth Edition, 2014
3. Andrew J. Dubrin, Essentials of Management, Thomson Southwestern, London, Tenth edition, 2014
4. Robbins S.P., Fundamentals of Management, Pearson, New Delhi, Second Edition, 2003

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

18CE867

MUNICIPAL WASTE AND MANAGEMENT
(Common to CE, CS, EE, IT & ME)
(OPEN ELECTIVE)

R 2018

L	T	P	C
3	0	0	3

Prerequisite: Environmental Engineering II

Objective(s):
- *To provide comprehensive overview of municipal waste and management*
- *To learn about on-site storage and processing of solid waste*
- *To provide knowledge on collection and transportation of waste*
- *To impart knowledge about the processing of municipal solid waste*
- *To impart knowledge about safe disposal of municipal solid waste*

UNIT – I   SOURCES AND TYPES OF MUNICIPAL SOLID WASTES   [9]

Sources and types of solid wastes - Quantity -   Factors   affecting generation of solid wastes - Characteristics - Methods of sampling and characterization- Effects of improper disposal of solid wastes - Public health effects- Principle of solid waste management - Social & economic aspects - Public awareness - Role of NGOs - Legislation

UNIT – II   ON-SITE STORAGE & PROCESSING   [9]

On site storage methods - Materials used for containers - On site segregation of solid wastes - Public health & economic aspects of storage - Options under Indian conditions - Critical Evaluation of Options

UNIT – III   COLLECTION AND TRANSFER   [9]

Methods of Collection - Types of vehicles - Manpower requirement - Collection routes; transfer stations - Selection of location- operation & maintenance - Options under Indian conditions - Usage GPS in route optimization - Application of GIS in collection and transfer of waste

UNIT – IV   OFF-SITE PROCESSING   [9]

Objectives of waste processing - Physical Processing techniques and Equipment; Resource recovery from solid wastes - composting - incineration - Pyrolysis - Options under Indian conditions

UNIT – V   TREATMENT &DISPOSAL   [9]

Dumping of solid waste - Building Demolition and Construction Waste - sanitary landfills - Site selection- Design and operation of sanitary landfills – Leach ate collection & treatment

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*

CO1: Characterize the solid waste based on source, type and composition and also emphasize the effects of its improper disposal.

CO2: Identify and suggest suitable on-site processing methods

CO3: Identify the suitable method for collection, segregation and transportation of solid waste

CO4: Select and adopt the suitable off-site processing techniques according to Indian conditions

CO5: Identify and suggest appropriate disposal methods for solid and wastes

Text Books :

1   Tchobanoglous, G. and Frank Kreith., Hand Book of Solid Waste Management, McGraw-Hill, Inc, New Delhi, Second Edition, 2002.

2   Ramachandra, T. V., Management of Municipal Solid Waste, TERI Press, New Delhi, First Edition, 2009.

Reference Books :

1   Worrell, William A. and AarneVesilind, P., Solid Waste Engineering, Cengage Learning Asia PTE Limited, Singapore, Second Edition, 2012.

2   Rao, M.N, Sultana, Razia Kota, and Sri Harsha., Solid and Hazardous Waste Management: Science and Engineering, Butterworth-Heinemann, Burlington, First Edition, 2016.

3   John Pichtel., Waste Management Practices: Municipal, Hazardous, and Industrial, CRC Press, Florida, Second Edition, 2014.

4   Freeman, H. M., Standard Handbook of Hazardous Waste Treatment and Disposal‖, McGraw-Hill, Inc, Noida, Second Edition, 1997.

INTELLIGENT VEHICLES TECHNOLOGY

18AU769   (Common to CS & IT)

(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

Prerequisite: NIL

Objectives:

- *To become familiar with various driver assistance systems.*
- *To comprehend the telematics in automotive systems.*
- *To recognize the automotive safety and security systems.*
- *To study about the comfort systems.*
- *To acquire the knowledge in various adaptive control systems.*

UNIT – I   DRIVER ASSISTANCE SYSYTEMS   [9]

Introduction - Driver support systems - Driver information- Driver perception - Driver convenience - Driver monitoring. Vehicle support systems - General vehicle control - Vehicle status monitoring and automated highway systems.

UNIT – II   TELEMATICS   [9]

Global positioning systems - Geographical information systems - Navigation systems - Automotive vision system - Road recognition and application of Internet of Things (IoT) in automotive industry

UNIT – III   SAFETY SYSTEMS & SECURITY SYSTEMS   [9]

Airbags - Seat belt tightening system - Collision avoidance and warning systems - Child lock- Antilock braking systems - Anti-theft technologies - Smart card system and number plate coding

UNIT – IV   COMFORT SYSTEMS   [9]

Active suspension systems - requirement and characteristics - Different types - Power steering - Collapsible and tiltable steering column and power windows.

UNIT – V   ADAPTIVE CONTROL SYSTEMS   [9]

Adaptive cruise control - adaptive noise control - anti spin regulation - traction control systems and cylinder cutoff technology and autonomous driving

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

CO1: Identify the various systems involved in driver support systems and their working principle

CO2: Familiarize with global positioning systems, geographical information systems and navigation systems

CO3: Comprehend the constructional and working features of safety systems and security systems

CO4: Recognize about the various comfort systems

CO5: Acquire about the various adaptive control systems

Text Book :

1 LjuboVlacic, Michel Parent and Fumio Harashima, Intelligent Vehicle Technologies, Butterworth-Heinemann publications, Oxford, 2001.

2 Ronald K Jurgen, Navigation and Intelligent Transportation Systems - Progress in Technology, Automotive Electronics Series, SAE, USA, 1998.

Reference Books :

1 Richard Bishop, Intelligent Vehicle Technology and Trends, Artech House, London, 2005.

2 William B Riddens, Understanding Automotive Electronics, Butterworth-Heinemann, Woburn, Eighth Edition,2017.

3 Robert Bosch, Automotive Handbook, Bently Publishers, Cambridge, Ninth Edition, 2014.

4 Bechhold, Understanding Automotive Electronics, SAE, 1998.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

ARCHITECHTURE PLANNING ASPECTS   L   T   P   C

18CE866   (Common to CE, CS, EE, IT & ME)

(OPEN ELECTIVE)   3   0   0   3

Prerequisite:

Objective(s):

- *To emphasis on architectural and functional aspects with respect to planning and design of building.*
- *To provide fundamental knowledge about natural and built environment.*
- *To explain the need and importance of building services.*
- *To describe the various stages of planning techniques and management.*
- *To illustrate building construction techniques, construction planning and management.*

UNIT – I   FUNDAMENTALS OF ARCHITECHTURE   [9]

Architect and Civil engineer – Definitions – Architecture – aesthetic – planning – Designing – Creating – Erecting – Constructing – Executing – Integrated approach in the design of building – Construction to architecture – History of designed architecture – understanding Basic elements or Primary elements form – Ordering principles of design.

UNIT – II   ENVIRONMENTAL PLANNING AND DESIGN   [9]

Ecosystem – natural and man–made ecosystem – Ecological principles – Concepts of Environmental Impact Analysis – Environmental considerations in planning and design – Thermal comfort, ventilation and air movement – Principles of lighting and illumination – Climate responsive design – Solar architecture – Principles of architectural acoustics – Green Building– Concepts and Rating – ECBC – Building Performance Simulation and Evaluation – Environmental pollution–types, causes, controls and abatement strategies.

UNIT – III   SERVICES, INFRASTRUCTURE AND TRANSPORTATION   [9]

Building Services – Water supply; Sewerage and drainage systems – Sanitary fittings and fixtures – Plumbing systems – Principles of internal and external drainage system – Principles of electrification of buildings – Intelligent Buildings – Elevators and Escalators – standards and uses – Air–Conditioning systems – Firefighting Systems – Building Safety and Security systems.

UNIT – IV   PLANNING TECHNIQUES AND MANAGEMENT   [9]

Tools and techniques of Surveys – Physical, Topographical, Land use and Socioeconomic Surveys – Methods of nonspatial and spatial data analysis – Graphic presentation of spatial data – Application of G.I.S and Remote Sensing techniques in urban and regional planning – Decision support system and Land Information System.

UNIT – V   CONSTRUCTION AND MANAGEMENT   [9]

Building construction techniques – Methods and details – Building systems and prefabrication of building elements – Principles of Modular Coordination – Estimation – Specification – Valuation – Professional practice – Construction planning and equipment – Project management techniques – PERT – CPM

Total = 45 Periods

Course Outcomes: On successful completion of the course, the student will be able to

CO1: *Describe the fundamentals of architecture, basic elements of design and methods of visual composition.*

CO2: *Analyze various design strategies of building for different types of climatic zones by assessing the effects of site, sun and wind in building response.*

CO3: *Demonstrate plumbing systems; and architectural considerations and their coordination with other services and architectural designs and fire safety measures.*

CO4: *Develop complete knowledge on planning techniques and management.*

CO5: *Discuss building construction techniques, the application of modularization and prepare project schedule through identification of critical tasks and path in a project.*

Text Books :

1 Francis D.K. Ching., Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, Fourth Edition, 2014

2 Hirasakar, G. K., The Great Ages of World Architecture, DhanpatRai Publications, New Delhi, Twenty Second Edition, 2018

Reference Books :

1 Paul Alan Johnson., The Theory of Architecture – Concepts and themes, Van Nostrand Reinhold Co, New York, First Edition, 1994

2 Yatin Pandya., Elements of Space making, Mapin Publishing Pvt Ltd, Ahmedabad, First Edition, 2014

3 Peter Gossel., Modern Architecture A-Z, Taschen GmbH Publisher, Cologne, Illustrated Edition, 2015

4 https://nptel.ac.in/courses/124/107/124107011/

Chairman (BoS)

Dr.1G2 Singaravel
Professor & Head
Department of Information Technology
K.S.R. College of Engineering (Autonomous)
Tiruchengode - 637 215
Namakkal (Dt), Tamilnadu, India.

PRINCIPAL,
K.S.R. COLLEGE OF ENGINEERING;
TIRUCHENGODE 637 209.