

ANURAG ENGINEERING COLLEGE

(An Autonomous Institution)

Computer Science & Engineering

Academic Regulations - for B. Tech (Regular)

(Effective for the students admitted into I year from the Academic Year **2014-2015** onwards)

1. Award of B.Tech. Degree

A student will be declared eligible for the award of the B. Tech. Degree if he fulfills the following academic regulations:

- i. Pursued a course of study for not less than four academic years and not more than eight academic years.
- ii. Register for 200 credits and secure 200 credits

2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.

3. Courses of study

The following courses of study are offered at present for specialization for the B. Tech. Course:

Branch Code	Branch
I.	Civil Engineering
II.	Computer Science and Engineering.
III.	Electrical and Electronics Engineering.
IV.	Electronics and Communication Engineering
V.	Mechanical Engineering.

And any other course as approved by the authorities of the College from time to time.

4. Credits

	For I Year – I/II semester		II, III, IV years per Semester	
	Periods / Week	Credits	Periods / Week	Credits
Theory	03	03	03	03
	02	02	04	04
Practical	03	02	03	02
Drawing	03T/03D	03	03	02
			06	04
Mini Project	--	--	--	02
Comprehensive Viva Voce	--	--	--	02
Seminar	--	--	6	02
Project	--	--	15	10

5. Distribution and Weightage of Marks

- i. The performance of a student in each semester shall be evaluated subject –wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, Industry

oriented mini-project, seminar, comprehensive viva-voce and project work shall be evaluated for 50, 50,100 and 200 marks respectively.

ii. For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End-Examination.

iii. For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination consists of Part-A (Short Answer) for 5 marks and Part-B (subjective paper) for 15 marks with duration of 90 Minutes and one assignment carrying 5 marks.

Subjective paper shall contain 5 questions of which student has to answer 3 questions each 5 marks. First mid term examination shall be conducted for 2.5 units of syllabus and second mid term examination shall be conducted for 2.5 units. First Assignment should be submitted before the conduct of the first mid, and the second Assignment should be submitted before the conduct of the second mid.

The total marks secured by the student in each mid term examination for 25 marks is considered and the average of the two mid term examinations shall be taken as the final marks secured by each candidate. If he/she is absent for any test / assignment, he/she is awarded zero marks for that test / assignment.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Out of the 25 marks for internal, day-to-day work in the laboratory shall be evaluated for 15 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted with one external examiner and one internal examiner. The external examiner shall be appointed from the panel of examiners as recommended by Chairman, Board of Studies in respective Branches.

v. For the subject having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

vi. There shall be an industry-oriented mini-Project, in collaboration with an industry of their specialization, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated in IV year I Semester. The industry oriented mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.

vii. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Departmental committee consisting of Head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.

viii. There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students' understanding in various subjects he / she studied during the

B.Tech course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive viva-voce.

- ix. Out of a total of 200 marks for the project work, 50 marks shall be for Internal Evaluation and 150 marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by the committee. The committee consists of an external examiner, head of the department, the supervisor of project and a senior faculty member of the department. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his project.

6. Attendance Requirements:

- i. A student shall be eligible to appear for the end examinations if he / she acquires a minimum of 75% of attendance in aggregate of all the subjects.
- ii. Condonation of shortage of attendance in aggregate up to 10% (on genuine medical grounds) in each semester may be granted by the College Academic Council on the basis of recommendation by the principal.
- iii. Shortage of Attendance below 65% in aggregate shall in NO case be condoned.
- iv. Students falling short of attendance as specified above will be detained.
- v. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek re-admission for that semester when offered next.
- vi. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
- vii. A stipulated fee decided by the Academic Council shall be payable towards condonation of shortage of attendance.

7. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.
- ii. A student shall be promoted from II to III year only if he fulfils the academic requirement of **Rule (I): 30** credits (out of 75 credits) secured from all the exams (both regular and supplementary) conducted up to end of II year, excluding the performance in II – B.Tech – II – Semester examination.

(OR)

- Rule (II): 40** credits (out of 100 credits) secured from all the exams (both regular and supplementary) conducted up to end of II year, including the performance in II – B.Tech – II – Semester examination.
- iii. A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of **Rule (I): Total 50** credits (out of 125 credits) secured from all the exams (both regular and supplementary) conducted up to end of III year, excluding the performance in III – B.Tech – II – Semester examination.

(OR)

Rule (II): 60 credits (out of 150 credits) secured from all the exams (both regular and supplementary) conducted up to end of III year, including the performance in III – B.Tech – II – Semester examination.

- iv. A student shall register and put up minimum attendance in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of percentage of marks.
- v. Students who fail to earn 200 credits as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.

8. Course pattern:

- i. The entire course of study is of four academic years. All years shall be on semester pattern.
- ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.
- iii. When a student is detained due to lack of credits / shortage of attendance he may be re-admitted when the semester is offered after fulfilment of academic regulations.

9. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

Class Awarded	% of marks to be secured	From the aggregate marks secured for the best 200 Credits.
First Class with Distinction	70% and above	
First Class	Below 70% but not less than 60%	
Pass Class	Below 50% but not less than 40%	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

10. Minimum Instruction Days:

For each semester there shall be 90 clear instruction days.

11. There shall be no branch transfers after the completion of admission process.

12. General:

- i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.
- ii. **The academic regulation should be read as a whole for the purpose of any interpretation.**
- iii. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
- iv. The COLLEGE may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the COLLEGE.

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Academic Regulations for B. Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II year from the Academic Year 2015-2016 and onwards)

1. The Students have to acquire 150 credits from II to IV year of B.Tech. Program (Regular) for the award of the degree.
Register for **150** credits and secure **150** credits.
2. Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).
4. **Promotion Rule:**

A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of

Rule (I): 30 Credits (out of 75 credits) secured from all the exams (both regular and supplementary) conducted upto end of 3rd year, excluding the performance in III-B.Tech-II-Sem Exam.

(OR)

Rule (II): 40 Credits (out of 100 credits) secured from all the exams (both regular and supplementary) conducted upto end of 3rd year, including the performance in III-B.Tech-II-Sem Exam.

5. **Award of Class:**

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

First Class with Distinction	70% and above	From the aggregate marks secured for 150 Credits. (i.e. II year to IV year)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

6. All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)

**MALPRACTICES RULES
DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS**

	Nature of Malpractices/Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester. The candidate is also debarred for two

		consecutive semesters from class work and all END examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also debarred for two consecutive semesters from class work and all END examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also debarred for two consecutive semesters from class work and all END examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the	Expulsion from the examination hall

	examination hall.	and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the PRINCIPAL for further action to award suitable punishment.	

ANURAG ENGINEERING COLLEGE

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Computer Science & Engineering

I YEAR I SEMESTER

COURSE STRUCTURE

S.No	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A51001	English-I	2	0	2	25	75	100
2	A51002	Mathematics - I	3	1	3	25	75	100
3	A51003	Engineering Physics-I	3	0	3	25	75	100
4	A51005	Computer Programming - I	3	1	3	25	75	100
5	A51010	Engineering Chemistry	3	1	3	25	75	100
6	A51011	Basic Electrical Engineering	3	1	3	25	75	100
7	A51217	English Language Communication Skills Lab - I	0	3	2	25	50	75
8	A51218	Computer Programming - I Lab	0	3	2	25	50	75
9	A51219	Engineering Chemistry Lab	0	3	2	25	50	75
10	A51220	IT Work shop	0	3	2	25	50	75
Total			17	16	25	250	650	900

I YEAR II SEMESTER

COURSE STRUCTURE

S.No	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A52001	English-II	2	0	2	25	75	100
2	A52002	Mathematics – II	3	1	3	25	75	100
3	A52003	Engineering Physics-II	3	0	3	25	75	100
4	A52006	Computer Programming - II	3	1	3	25	75	100
5	A52008	Mathematics - III	3	1	3	25	75	100
6	A52011	Engineering Graphics	3	3	3	25	75	100
7	A52217	English Language Communication Skills Lab - II	0	3	2	25	50	75
8	A52218	Computer Programming – II Lab	0	3	2	25	50	75
9	A52219	Engineering Physics Lab	0	3	2	25	50	75
10	A52220	Engineering Workshop	0	3	2	25	50	75
Total			17	18	25	250	650	900

II YEAR I SEMESTER**COURSE STRUCTURE**

S.No	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A53020	Probability & Statistics	3	1	3	25	75	100
2	A53021	Discrete Mathematics	3	1	3	25	75	100
3	A53022	Data Structures	4	0	4	25	75	100
4	A53023	Electronic Devices and Circuits	3	1	3	25	75	100
5	A53024	Digital Logic Design	3	1	3	25	75	100
6	A53025	Object Oriented Programming	4	0	4	25	75	100
7	A53209	Electronic Devices and Electrical Circuits Lab	0	3	2	25	50	75
8	A53210	Data Structures Lab	0	3	2	25	50	75
9	A53211	Personality Development – I*	0	2	1	50	-	50
Total			20	12	25	250	550	800

II YEAR II SEMESTER**COURSE STRUCTURE**

S.No	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A54010	Environmental Studies	3	0	3	25	75	100
2	A54022	Formal Languages and Automata Theory	3	1	3	25	75	100
3	A54023	Computer Organization	3	1	3	25	75	100
4	A54024	Database Management Systems	4	0	4	25	75	100
5	A54025	Software Engineering	3	1	3	25	75	100
6	A54026	Java Programming	4	0	4	25	75	100
7	A54215	Java Programming Lab	0	3	2	25	50	75
8	A54216	Database Management systems lab	0	3	2	25	50	75
9	A54217	Personality Development – II*	0	2	1	50	-	50
10	A54218	Gender Sensitization	0	2	0	25	50	75
Total			20	13	25	275	600	875

III YEAR I SEMESTER
COURSE STRUCTURE

S.No	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A55023	Design and Analysis of Algorithms	4	1	4	25	75	100
2	A55024	Compiler Design	3	1	3	25	75	100
3	A55025	Web Technologies	3	0	3	25	75	100
4	A55026	Computer Networks	3	1	3	25	75	100
5	A55027	Operating systems	4	0	4	25	75	100
6	A55209	Advanced English Communication Skills Lab	0	3	2	25	50	75
7	A55210	Web Technologies Lab	0	3	2	25	50	75
8	A55211	Operating Systems and Computer Networks Lab	0	3	2	25	50	75
9	A55212	Logical Reasoning and Quantitative Aptitude – I	0	3	2	25	50	75
Total			17	15	25	225	575	800

III YEAR II SEMESTER
COURSE STRUCTURE

S.No	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A56031	Advanced Computer Networks	3	1	3	25	75	100
2	A56032	Data Warehousing and Data Mining	3	1	3	25	75	100
3	A56033	Cloud Computing	4	0	4	25	75	100
Elective - 1								
4	A56034	Human Computer Interaction	3	1	3	25	75	100
	A56035	Unix Programming						
	A56036	Computer Graphics						
5	A56037	Object Oriented Analysis and Design	3	1	3	25	75	100
6	A56038	Software Project Management	3	0	3	25	75	100
7	A56210	Object Oriented Analysis and Design Lab	0	3	2	25	50	75
8	A56211	Data Warehousing and Data Mining Lab	0	3	2	25	50	75
9	A56212	Logical Reasoning and Quantitative Aptitude – II	0	3	2	25	50	75
Total			19	13	25	225	600	825

IV YEAR I SEMESTER

COURSE STRUCTURE

S.No.	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A57037	Advanced Databases	4	1	4	25	75	100
2	A57038	Information Security	4	0	4	25	75	100
3	A57039	Big Data Analytics	3	1	3	25	75	100
4	A57040	Managerial Economics & Financial Analysis	3	1	3	25	75	100
Elective - 2								
5	A57041	Image Processing	3	1	3	25	75	100
	A57042	Information Retrieval Systems						
	A57043	Cyber Forensics						
Elective - 3								
6	A57044	Adhoc Sensor Networks	3	1	3	25	75	100
	A57045	Software Testing						
	A57046	Software Development for Portable Devices						
7	A57213	Information Security lab	0	3	2	25	50	75
8	A57214	Industry Oriented Mini Project	0	3	2		50	50
Total			20	11	24	175	550	725

IV YEAR II SEMESTER

COURSE STRUCTURE

S.No.	Course Code	Course	L	T/P/D	C	Internal Marks	External Marks	Total Marks
1	A58031	Multimedia Computing	3	1	3	25	75	100
Elective - 4								
2	A58032	Entrepreneurship	3	0	3	25	75	100
	A58033	Artificial Intelligence						
	A58034	Soft Computing						
Elective - 5								
3	A58035	Internet of Things	3	0	3	25	75	100
	A58036	Network Security and Privacy						
	A58037	Machine Learning						
4	A58213	Seminar	0	6	2	50		50
5	A58214	Project Work	0	15	13	50	150	200
6	A58215	Comprehensive Viva	0	0	2	100		100
Total			9	22	26	275	375	650

T – Tutorial

P – Practical

D – Drawing

L-Lectures

C-Credits

ANURAG ENGINEERING COLLEGE

(An Autonomous Institution)

I Year B.Tech. CSE – I Sem

L	T/P/D	C
2	0	2

(A51001)ENGLISH-I

1. INTRODUCTION:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc. The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

Course Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.

2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play – Individual/Group activities (Using exercises from the five units of the prescribed text: **Skills Annexe - Functional English for Success**)
- Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and Comprehension.
 2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
- Skimming the text
 - Understanding the gist of an argument
 - Identifying the topic sentence
 - Inferring lexical and contextual meaning
 - Understanding discourse features
 - Scanning
 - Recognizing coherence/sequencing of sentences

NOTE : The students will be trained in reading skills using the prescribed text for detailed study.

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills :

Objectives

1. To develop an awareness in the students about writing as an exact and formal skill
 2. To equip them with the components of different forms of writing, beginning with the lower order ones.
- Writing sentences
 - Use of appropriate vocabulary
 - Paragraph writing
 - Coherence and cohesiveness
 - Narration / description
 - Note Making
 - Formal and informal letter writing
 - Describing graphs using expressions of comparison

UNIT –I

Chapter 1: **'Wit and Humour'** from 'Skills Annexe' -Functional English for Success, Published by Orient Black Swan, Hyderabad

L-Listening For Sounds, Stress and Intonation

S-Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)

R- Reading for Subject/ Theme

W- Writing Paragraphs

UNIT –II

Chapter 2: **'Mokshagundam Visvesvaraya'** from "Epitome of Wisdom", Published by Maruthi Publications, Hyderabad.

G-Types of Nouns and Pronouns

V- Homonyms, homophones synonyms, antonyms

UNIT-III

Chapter 3: “**Cyber Age**” from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad.

L – Listening for themes and facts

S – Apologizing, interrupting, requesting and making polite conversation

R- For theme and gist

W- Describing People, Places, Objects, Events

UNIT-IV

Chapter 4:“**Three Days To See**’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad

G- Verb forms

V- noun, verb, adjective and adverb

UNIT-V

Chapter 5‘**Risk Management**’ from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad

L – for main points and sub-points for note taking

S – giving instructions and directions; Speaking of hypothetical situations

R – reading for details

W – note-making, information transfer, punctuation

Text Books:

1. For Detailed study: First Textbook: “Skills Annexe -Functional English for Success”, Published by Orient Black Swan, Hyderabad
2. For Non-Detailed Study:Second Text Book “Epitome Of Wisdom”, Published By Maruthi Publications, Guntur

Reference Books :

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi.2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw – Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.
11. Murphy’s English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixson, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw –Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO

17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education

18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,

19. A Grammar Book for You And I, C. Edward Good, MacMillan Publishers

Course Outcomes:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency
- Gaining confidence in using language in verbal situations.

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L	T/P/D	C
3	1/-/	3

(A51002)MATHEMATICS-I (Calculus and Matrices)

Course Objectives:

- Able to know the Mean value theorems and determine the maxima and minima for function of several variables.
- Concepts of matrix algebra, methods of solving system of linear equations.
- Determine eigen values and eigen vectors of a matrix, Cayley Hamilton theorem and inverse by Cayley Hamilton theorem
- Develop a strategy for finding a solution of given arbitrary differential equation, using different methods.
- Understand the sol of higher order differential equations, application of ODE in Bending of beams, electrical circuits and simple harmonic motion.

UNIT-I: Functions of Single Variable and Functions of several variables

Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Generalized Mean Value theorem (all theorems without proof) – Geometrical interpretation of Mean value theorems. Functions of several variables – Partial Differentiation and total differentiation - Functional dependence-Jacobian Determinant- Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT-II: Matrices and Linear System of Equations

Matrices and Linear systems of equations: Real matrices – Symmetric, skew - symmetric, orthogonal, Linear Transformation – Orthogonal Transformation. Complex matrices: Hermitian, Skew – Hermitian and Unitary. Elementary row transformations-Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods (Gauss Elimination, Gauss Jordan).

UNIT-III: Eigen Values and Eigen Vectors

Eigen values, Eigen vectors – properties, Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix.

UNIT-IV: Differential Equations of first order and their Applications

Differential equations of first order and first degree: exact, linear and Bernoulli, Applications to Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT-V: Higher Order Linear Differential Equations and their Applications

Linear differential equations of second and higher order with constant coefficients, RHS term of the type $f(X) = e^{ax}, \sin ax, \cos ax$ and $x^k, e^{ax}V(x), x^kV(x)$. Method of variation of parameters. Applications - Bending of beams, Electrical circuits, simple harmonic motion.

Text Books:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th Edition, New Delhi, Khanna Publishers.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Engineering Mathematics Vol - I, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
3. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
4. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

Reference Books:

1. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House.
2. Shahanaz Bathul (2007), Engineering Mathematics-I, 3rd Edition, Hyderabad, Right Publishers.
3. Ramana B.V (2010), Engineering Mathematics, New Delhi, Tata McGraw Hill Publishing Co. Limited
4. Mathematical Methods: S.R.K. Iyengar and R.K. Jain, Narosa Publishing House.
5. Mathematical Methods of Science and Engineering (Aided with Matlab) Kanti B.Datta (2012), Seventh Edition, CENGAGE Learning.

Course Outcomes:

- Understand Rolle's and the Mean value theorems and to verify the Mean value theorems
- Apply partial derivatives to study maxima and minima of functions of two variables
- Define rank and elementary transformations of a matrix.
- Discuss Non homogeneous and homogeneous system of equations.
- Compute eigen values and corresponding eigen vectors of a square matrix.
- Specify standard methods for solving differential equations and their applications in geometrical and physical problems.
- Identify different types of higher order differential equations and their applications in engineering problem solving.

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L	T/P/D	C
3	0	3

(A51003)ENGINEERING PHYSICS – I

Course objectives:

- Emphasize the study of interference, diffraction and create an ability to design and conduct experiments like diffraction grating.
- To impart the knowledge of mathematics and science to determine the crystal structures of various systems.
- Having knowledge of classical and quantum statistics of distribution, the study of behavior of particles in large number is possible.
- Impart the importance of magnetic materials and super conductors and their applications.
- To enable the students to know about the influence of electric field on dielectric materials and thereby solve the problems relating the topic.

UNIT- I Interference And Diffraction:

Superposition principle, resultant amplitude, coherence, methods to obtain coherent sources, interference, Young's double slit experiment (Qualitative), interference in thin films by reflection, Newton's rings Experiment, Distinction between Fraunhofer and Fresnel diffraction, Diffraction at single slit, Diffraction grating (Qualitative), Introduction to polarization, Brewster's law and Double refraction.

UNIT - II Crystal Structures:

Space lattice – Unit cell – Lattice parameter – Crystal systems – Bravais lattices, Atomic radius – Co-ordination number - Structures and Packing fractions of Simple Cubic – Body Centered Cubic – Face Centered Cubic crystals.

Directions, Planes And X-Rd:

Miller Indices for Crystal planes and directions – Inter planar spacing of orthogonal crystal systems – Diffraction of X-rays by crystal planes and Bragg's law – Powder method – Applications of X-ray diffraction.

UNIT - III Elements Of Statistical Mechanics:

Introduction, Phase space, Definition of Ensembles, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics – Photon gas – Planck's law of black body radiation – Deduction of Wien's law and Rayleigh-Jeans law from Plank's law

UNIT – IV Magnetic Properties :

Introduction – Basic definitions - Origin of magnetic moment, Bohr magneton – Classification of magnetic materials (Dia, Para and Ferro)- Domain theory of ferromagnetism, Hysteresis curve – Soft and Hard magnetic materials – properties of Anti ferro and Ferri magnetic materials .

Superconductivity: Introduction, Meissner effect – Critical fields, Type I and Type II superconductors-Applications of super conductors.

UNIT - V Dielectric Properties:

Electric dipole, Dipole moment, Dielectric constant – Parallel plate Capacitor, Electronic, Ionic and Orientation Polarization – Calculation of Polarizibilities – Internal fields – Claussius – Mossotti equation – Basic concepts of Piezo, Pyro and Ferro electricity.

Text Books:

1. Engineering Physics by P K palanisamy :Scietech publication

2. Solid State Physics by M Armugam; Anuradha Publications

Reference Books:

3. Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons

4. Engineering Physics by R.K.Gaur and S.L.Gupta; Dhanpat Rai and Sons

5. Engineering Physics by V Rajendran; McGraw hill education private ltd.

6. A Text book of Engineering Physics by M N Avadhanulu, P G Kshirsagar; S Chand

7. Engineering Physics by K Malik, A K Singh; Tata Mc Graw hill book publishers

8. Engineering Physics by M.R.Srinivasan, New Age Publishers

Course Outcomes:

- Finally the students may be familiar with the topics of crystals, dielectrics, optics etc... which will be useful in various branches of technology.
- There will be a chance for them use the subject as a mathematical tool to solve their real life problems.

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L	T/P/D	C
3	1/-/	3

(A51005)COMPUTER PROGRAMMING – I

Course Objectives:

- To explain representation of numbers, alphabets and other characters in computer system
- To understand the basic concepts in C Programming Language
- To explain software development tools like algorithm, pseudo codes and programming structure.
- To explain selection and repetition statements in 'C' Language
- To explain arrays to solve problems
- To explain strings and string operations
- To learn how to write modular programming in 'C' Language.

UNIT - I

Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, operating system functions, language processor concepts.

Overview of C Language : Program structure and simple programs using scanf and printf functions.

Data representations- Binary, octal, hexa number systems, ASCII and EBCDIC, data types, Identifiers, Variables, Constants, declarations.

UNIT - II

Operators, Expressions, Precedence and Associativity, evaluation of expressions, sample programs using expressions, Type conversions, unformatted I/O.

Algorithms- control structure – grouping, selectors, repetitions.

Step wise refinement, flowchart.

UNIT - III

Statements- Selection Statements – if and switch statements, algorithm and program example using selectors.

Repetition statements (loops)-while, for, do-while statements, algorithm development using repetition and programs using repetition, break, continue, goto, exit, Simple C Program examples.

UNIT - IV

Arrays – Introduction, declaration, reading and printing arrays , programs using arrays, two – dimensional arrays,

Multidimensional arrays, C program examples.

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, C program examples.

UNIT – V

Functions- procedural abstraction, function declarations, function calls and parameter passing , Standard functions, Storage classes- recursion- recursive functions, example C programs.

Text Books:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh , Oxford University Press.

Reference Books:

1. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.

2. C for All, S. Thamarai Selvi, R.Murugesan, Anuradha Publications.
3. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, 7th Edition, Pearson education.
4. Programming in C, Ajay Mittal, Pearson.
5. Programming with C, B.Gottfried, 3rd edition, Schaum's outlines, TMH.
6. Problem solving with C, M.T.Somasekhara, PHI
7. Programming with C, R.S.Bickar, Universities Press.
8. Computer Programming & Data Structures, E.Balagurusamy, 4th edition, TMH.

Course Outcomes:

Upon completion of this course the students will have an:

- Ability to design algorithmic solutions to problem
- Ability to convert algorithms to C-Programs
- Ability to write, compile and debug programs in C Language
- Ability to write Programs using selection and repetition statements
- Ability to write programs using Arrays and Strings
- Ability to design structured programming.

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(A51010)ENGINEERING CHEMISTRY

Course objectives:

- To appraise the students about the importance and role of chemistry in the field of Engineering by explaining the relevant topics.
- To enable students to apply the knowledge acquired in improving the properties of engineering materials.
- To provide the students with the necessary knowledge to solve the problems and make decisions with regards to the application of materials in a variety of engineering disciplines.
- To equip the students with the required fundamentals of engineering chemistry carry out in the interdisciplinary research such that the findings benefit the common man.
- After the completion of the course, the student would understand about the important chemistry of water, corrosion and its control, polymer chemistry, electrochemistry (including batteries) and advanced engineering materials.

UNIT I: Water: Hardness of water, expression of hardness (CaCO_3 equivalent), units and types of hardness. Estimation of temporary and permanent hardness of water by EDTA method. Numerical problems based on hardness of water. Potable water: characteristics, treatment of water for domestic supply. Desalination of brackish water: reverse osmosis. Alkalinity of water and its determination. Boiler troubles: priming and foaming, boiler corrosion, scales, sludges and caustic embrittlement. Boiler feed water and its treatment: Internal treatment (colloidal, phosphate calgon conditioning of water). External treatment (zeolite process and ion –exchange process) , Numerical problems on softening of water.

UNIT II: Electro Chemistry : Conductance and its types . Electrode, electrode potential, galvanic cell , cell reactions and cell notation, cell EMF , types of electrodes (Normal Hydrogen Electrode , calomel electrode, glass electrode and quinhydrone electrode) , Nernst equation Numerical problems. Potentiometric titrations. Concentration cells, classification with examples.

Batteries: Introduction to cell and battery, characteristics of a cell. Primary (dry cell and lithium cell) and secondary cells, (lead-Acid cell, Ni-Cd cell and Lithium ion cells,). Solar battery, engineering applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell, advantages and engineering applications of fuel cells.

UNIT III: Corrosion And Its Control Introduction, types of corrosion : chemical and electrochemical corrosion, mechanism of chemical and electrochemical corrosion , galvanic , water line and pitting corrosion, factors affecting the rate of corrosion : nature of the metal , galvanic series, purity of metal, nature of corrosion product , nature of environment : effect of temperature, effect of pH, humidity. Corrosion control methods: Cathodic protection: sacrificial anode method and impressed current cathode method. Protective coatings : metallic coatings (anodic and cathodic), methods of application on metals , hot dipping (galvanizing) , cladding, cementation, electroplating(of copper) electroless plating (of nickel) . Organic coatings – paints, its constituents and their functions.

UNIT IV: Polymer Chemistry : Introduction, classification of polymers, types of polymerization (addition and condensation, *mechanisms not included*). Plastics- types of plastics -thermoplastics and thermosetting plastics. Compounding and moulding of plastics. Preparation, properties and engineering applications of PVC, Teflon and Bakelite. Fibers:

Nylon 6, 6 and Terelene (Dacron). Elastomers: natural rubber, structure, vulcanization. Synthetic rubbers: Buna-S, butyl rubber, Thikol rubber. Conducting polymers: classification, mechanism of conduction, Poly acetylene - preparation and effects of doping on conduction. Applications of conducting polymers.

UNIT V: Advanced Engineering Materials: Biodegradable polymers, types, examples: Polyhydroxy butyrate (PHB) ,Poly-Hydroxybutyrate-co-b-Hydroxy valerate (PHBV) ,Polyglycolic acid (PGA) , Polylactic acid (PLA) ,Poly (Î-caprolactone) (PCL). Applications of biodegradable polymers.

Composite materials: Constituents of composite materials. Types of composite materials. Advantages and engineering applications of composite materials.

Nano materials: Introduction, basic methods of preparation and applications of nano materials.

Insulators- Classification, characteristics of thermal & electrical insulators and applications.

Biofuels – biodiesel, general methods of preparation and advantages

Text Books:

1. Engineering Chemistry by NYS.Murthy, Pearson, India.
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpat Rai Publishing Company

Reference Books:

1. Text Book of Engineering Chemistry by Shasi Chawla, Dhantpat Rai publishing Company,
2. Engineering Chemistry by C.Daniel Yesudian , Anuradha publications

Course outcomes:

- Industrious Students and health conscious ones remain inquisitive on potable water its parameter and usage
- dynamic students indeed capable of explaining the various aspects of electro chemistry work out numerical problems
- Thorough with cells and solar, fuel cells
- gets augmented to the caliber in knowing corrosion and causes going around and capable of suggesting periodical maintenance

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3	1/-/	3

(A51011)BASIC ELECTRICAL ENGINEERING

Course Objective:

- This course introduces the basic concept of circuit analysis which is the fundamental for all subjects of the Electrical engineering discipline. The emphasis of this course is laid on the basic analysis of circuit which includes single phase circuits, magnetic circuits, theorems, principle and working operation of AC & DC Machines and basic Instruments .

UNIT-I Introduction to Electrical Engineering:

Basic definitions, types of elements, types of sources, Kirchhoff's Laws, resistive networks, inductive networks, series , parallel circuits, Star- Delta and Delta- Star transformation, Network theorems- Super position, Thevenin's, Maximum power transfer theorems and simple problems.

Magnetic circuits: Magnetic circuits, Faraday's laws of Electromagnetic Induction, concept of Self & Mutual Inductance.

UNIT-II : Alternating Quantities:

Principle of AC voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltages, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of an AC circuits with basic network elements, single phase series circuit. Introduction to 3-Phase Circuits.

UNIT –III: DC Machines:

Principle of operation of D.C machines, types of D.C generators, emf equation in D.C generator.

Principle of operation of D.C motors, types of D.C motors, losses and torque equation, losses and efficiency calculation in D.C Machines.

UNIT-IV: AC Machines:

Transformers: Principles of operation, Constructional details. Ideal transformer and practical transformer, Losses, OC & SC test, Efficiency (All the above topics are only elementary treatment and simple problems).

Three phase induction motor: Principle of operation, slip and rotor frequency, torque (simple problems).

UNIT –V: Basic Instruments:

Introduction, classification of instruments, operating principles, essential features of measuring instruments Permanent Magnet Moving Coil (PMMC) & Moving Iron(MI) instruments, Ammeters and Voltmeters (elementary Treatment only)

Text Books:

1. Basic Electrical Engineering-By M.S. Naidu and S. Kamakshiah-TMH.
2. Basic Electrical Engineering- By T.K. Nagasarkar and M.S. Sukhija, Oxford University press.
3. Electrical and Electronics technology- By Hughes-Pearson Education.

Reference Books:

1. Theory and problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath, PHI.
2. Principles of Electrical Engineering by V.K Mehta, S. Chand Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson .

Course Outcomes:

- To know about the types of circuit elements, their type of connections and solving techniques of all types of electrical circuits.
- To know about the A.C quantities, their representation and analysis of single phase and three phase circuits.
- To know about the D.C machines principle of operation, types, losses and efficiency calculations.
- To know about the transformers and A.C machines principle of operation, constructional details, losses and efficiency calculations.
- To know about the measuring instruments principle of operation, classifications and simple problems.

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L	T/P/D	C
0	3	2

(A51217)ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-I

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Course Objectives

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab:

Exercise-I

CALL Lab: Introduction to Phonetics
Speech Sounds
Vowels and Consonants

Exercise-II

ICS Lab: Ice-Breaking activity and JAM session
Articles, Prepositions, Word formation- Prefixes & Suffixes, Synonyms & Antonyms

Exercise-III

CALL Lab: Structure of Syllables
Past Tense Marker and Plural Marker
Weak Forms and Strong Forms
Consonant Clusters.

Exercise-IV

ICS Lab: Situational Dialogues -Role-Play- Self-introduction and introducing others-Greetings- Apologies- Requests.

Exercise-V

ICS Lab: Social and Professional Etiquette and Telephone Etiquette-Tenses-Non-Verbal Communications.

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

Text Books:

1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
2. Strengthen Your Steps - Dr. M. Hari Prasad and others, Maruthi Publications
3. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
4. Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
5. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
6. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
7. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
8. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
9. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi : Foundation
10. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
11. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
12. English Pronouncing Dictionary Daniel Jones Current Edition with CD.
13. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)
14. Lab Manual: A Manual entitled “English Language Communication Skills (ELCS) Lab Manual- cum- Work Book”, published by Cengage Learning India Pvt. Ltd, New Delhi, 2013

Course Outcomes:

- Better Understanding of nuances of language through audio- visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

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(A51218)COMPUTER PROGRAMMING – I LAB

Course Objectives:

- To make the student learn Linux commands
- To make the student learn a programming language
- To teach the student to write programs in C to solve the problems
- To make the student to write the programs using control statements
- To make the student to use arrays for solving the problems
- To make the student to write modular programming

Week 1:

1. Familiarity with Linux Commands – Login, Wild Chars, ls, cp, mv, mkdir, wc, chdir.
2. Creation of text files using vi editor.

Week 2:

Using vi editor – perform operations of pattern search, insertion, deletion and substitution operations

Week 3:

Write simple programs using scanf and printf functions and familiarity with format strings.

Week 4 & 5:

Write programs to illustrate the Assignment Operators

Week 6:

Write programs to illustrate the Logical Operators

Week 7:

Write programs to illustrate the Relational Operators

Week 8:

Write programs using If Statement

Week 9:

Write programs using while, do-while loops

Week 10:

Write programs using for loop

Week 11:

Write programs to illustrate one dimensional arrays

Week 12:

Write programs to illustrate two dimensional arrays

Week 13:

Write programs to illustrate String concepts.

Week 14:

Write programs using functions

Week 15:

Review

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0	-/3/-	2

(A51219)ENGINEERING CHEMISTRY LAB

Course objectives:

- To impart fundamental knowledge in handling the equipment /glassware and chemicals in the chemistry laboratory.
- To offer hands on experience on the basic equipment related to engineering chemistry.
- For practical understanding of theoretical concepts of chemistry.

(Any ten experiments out of the following fourteen experiments should be performed)

Titrimetry:

1. Fundamentals of volumetric analysis : (a) Determination of strength of an acid (HCl)
2. Estimation of ferrous iron by dichrometry
3. Estimation of hardness of water by EDTA method.
4. Determination of alkalinity of water.
5. Determination of free chlorine or chlorides in water.
6. Determination of iron by permanganometry.
7. Estimation of copper by colorimetric method.
8. Estimation of HCl by conductometry using standard NaOH solution.
9. Estimation of HCl by potentiometry using standard NaOH solution.
10. Determination of viscosity of sample oil by Redwood/Oswald's viscometer
11. Determination surface tension of lubricants.
12. Determination of the rate constant of acid catalyzed hydrolysis of methyl acetate .
13. Preparation of thiokol rubber and nylon 6,6.
14. Preparation of Biodiesel from Waste Vegetable Oil (WVO).

Text Books:

1. Vogel's Textbook of Quantitative Chemical Analysis
2. Essentials of experimental engineering chemistry, Shashi Chawla, Dhanpat Rai & Co
3. Laboratory manual of engineering chemistry, S.K.Bhasin and Sudha Rani ,Dhanpat Rai & Co.
4. A text book on experiments and calculations. S.S. Dara, S. Chand & Co

Reference Books:

1. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

Course Outcomes:

- As commences with fundamentals which indeed takes the individual students to be more conversant with apparatus and allied .
- Gets equipped with the technical importance of knowing the extent of hardness and consciousness of units.
- Students gets augmented the adroitness and keep aware of some industrial determination techniques
- As commences with fundamentals which indeed takes the individual students to be more conversant with apparatus and allied .

- Gets equipped with the technical importance of knowing the extent of hardness and consciousness of units.
- Students gets augmented the adroitness and keep aware of some industrial determination techniques

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(A51220)IT WORKSHOP

Course Objectives:

The IT Workshop for engineers is a training lab course spread over 40 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, and Power Point.

- **PC Hardware** introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.
- **Internet & World Wide Web** module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email.
- **Productivity tools** module would enable the students in crafting professional word documents, excel spread sheets and power point presentations. (Recommended to use Microsoft office 2007 in place of MS Office 2003)

PC Hardware

Exercise 1 – Task 1: Identify the peripherals of a computer, components in a System Cabinet and its functions. Draw the block diagram of the compute mother board along with the configuration of each peripheral and submit to your instructor.

Exercise 2 – Task 2 : Every student should disassemble and **assemble the PC back to working condition**. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Exercise 3 – Task 3 : Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Exercise 4 – Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva.

Internet & World Wide Web

Exercise 5 - Task 1 : Orientation & Connectivity Boot Camp : Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Exercise 6 - Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

MS Word

Exercise 7&8: The mentor needs to give an overview of Microsoft (MS) word 2007: Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word. Give a task covering to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Inserting table, using Drawing toolbar in word.

MS Excel

Exercise 9&10: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool covering Accessing, overview of toolbars, saving excel files, Using help and resources., Also give a task that is covering the features like Gridlines, Format Cells, Summation, auto fill, Formatting Text.

MS Power Point

Exercise 11&12: Students will be working on MS power point which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Reference Books:

1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dream tech
2. The Complete Computer upgrade and repair book,3rd edition Cheryl A Schmidt, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)
5. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
6. IT Essentials PC Hardware and Software Labs and Study Guide Third Edition by Patrick Regan – CISCO Press, Pearson Education

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(A52001)ENGLISH – II

1. INTRODUCTION:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc. The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

2. Course Objectives:

1. To improve the language proficiency of the students in English with emphasis on LSRW skills.
2. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
3. To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions.

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

- i. Listening for general content
- ii. Listening to fill up information
- iii. Intensive listening
- iv. Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.

2. To enable students to express themselves fluently and appropriately in social and professional contexts.
 - Oral practice
 - Describing objects/situations/people
 - Role play – Individual/Group activities (Using exercises from the five units of the prescribed text: **Skills Annexe - Functional English for Success**)
 - Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
 - Skimming the text
 - Understanding the gist of an argument
 - Identifying the topic sentence
 - Inferring lexical and contextual meaning
 - Understanding discourse features
 - Scanning
 - Recognizing coherence/sequencing of sentences

NOTE : The students will be trained in reading skills using the prescribed text for detailed study.

They will be examined in reading and answering questions using ‘unseen’ passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills :

Objectives

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.
 - Writing sentences
 - Use of appropriate vocabulary
 - Paragraph writing
 - Coherence and cohesiveness
 - Narration / description
 - Note Making
 - Formal and informal letter writing
 - Describing graphs using expressions of comparison

UNIT-I

Chapter 1: **‘Leela’s Friend’** by R.K. Narayan from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad

G – Present Tense

V – Synonyms and Antonyms

UNIT-II

Chapter 2: **‘Human Values and Professional Ethics’** from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad

L -Listening for specific details and information

S- Narrating, expressing opinions and telephone interactions

R -Reading for specific details and information

W- Writing formal letters and CVs

UNIT-III

Chapter 3: '**The Convocation Speech**' by N.R. Narayanmurthy' from "Epitome of Wisdom", Published by Maruthi Publications, Hyderabad

G- Past and future tenses

V- Vocabulary - idioms and Phrasal verbs

UNIT-IV

Chapter 4: '**Sports and Health**' from "Skills Annexe -Functional English for Success" Published by Orient Black Swan, Hyderabad

L- Critical Listening and Listening for speaker's tone/ attitude

S- Group discussion and Making presentations

R- Critical reading, reading for reference

W-Project proposals; Technical reports, Project Reports and Research Papers

UNIT-V

Chapter5: '**The Secret of Work**' from "Epitome of Wisdom", Published by Maruthi Publications Hyderabad.

G- Adjectives, Prepositions and Concord

V- Collocations and Technical Vocabulary

Text Books:

- For Detailed study: First Textbook: "Skills Annexe -Functional English for Success", Published by Orient Black Swan, Hyderabad
- For Non-detailed study: Second text book "Epitome of Wisdom", Published by Maruthi Publications, Guntur

Reference Books:

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi.2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw – Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.
11. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixson, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw –Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
19. A Grammar Book for You And I, C. Edward Good, MacMillan Publishers

Course Outcomes:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency
- Gaining confidence in using language in verbal situations.

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(A52002)MATHEMATICS-II (Mathematical Techniques)

Course Objectives:

- To introduce some special functions like Gamma, Beta and learn how to evaluate definite integrals with the help of special functions.
- Able to know the Laplace , Inverse Laplace transform and sol of ODE by using Laplace transforms
- Evaluate the multiple integrals and analyze the DEL properties.
- Apply the theorems by using line, surface and volume integrals
- Determine the Fourier coefficients of a given function. Analyze the characteristics and properties of Fourier transforms

UNIT-I: Laplace transform and its applications to Ordinary differential equations

Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms – Application of Laplace transforms to ordinary differential equations.

UNIT-II: Gamma and Beta Functions:

Gamma and Beta Functions-Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions.

UNIT – III: Multiple Integrals:

Multiple integrals - double and triple integrals – change of order of integration- change of variables. Gradient- Divergence- Curl and their related properties - Potential function - Laplacian and second order operators.

UNIT-IV: Vector Calculus

Line integral – work done — Surface integrals - Flux of a vector valued function. Vector integrals theorems: Green's – Stoke's and Gauss's Divergence Theorems (Only Statements & their Verifications).

UNIT-V: Fourier Series

Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

Text Books:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th Edition, New Delhi, Khanna Publishers.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
3. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Engineering Mathematics Vol - I, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
4. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

Reference Books:

1. Shahanaz Bathul (2007), Mathematical Methods, 3rd Edition, Hyderabad, Right Publishers.

2. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House.
3. Dass H.K. and Rajnish Verma Er (2007), Higher Engineering Mathematics, First Edition, New Delhi, S. Chand & Company Limited.
4. Integral Transforms by A.R.Vasista
5. Schaum's outline series on Vector Analysis; Linear Algebra.
6. Larry C. Andrews and Bhimsen K. Shivamoggi, Integral Transforms for Engineers, Prentice – Hall of India Private Limited, New Delhi.
7. Mathematical Methods of Science and Engineering (Aided with Matlab) Kanti B.Datta (2012), Seventh Edition, CENGAGE Learning.

Course Outcomes:

- Apply Beta and Gamma functions to evaluate many integrals which cannot be expressed in terms of elementary functions.
- Apply Laplace transform to solve differential equations which will be converted to algebraic
- Evaluate double integrals by changing variables , changing order and triple integration
Calculate line integrals along piecewise smooth paths, interpret such quantities as work done by a force
- Apply Green's theorem to evaluate line integrals along simple closed contours on the plane, Stoke's theorem to give physical interpretation of the curl of a vector field and Divergence theorem to give physical interpretation of the divergence of a vector field
- Develop Fourier series of periodic functions.

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(A52003)ENGINEERING PHYSICS – II

Course Objectives:

- To impart the knowledge of mathematics and science to determine the working of semiconductor devices .
- Emphasize the study of Quantum mechanics to apply it to solve problems of micro & macro particles.
- To have the knowledge of laser technology to know about the working & applications of laser.
- To inculcate the importance of nanotechnology which has the world wide importance.

UNIT- I Principles Of Quantum Mechanics:

Waves and particles – De Broglie hypothesis - Matter waves - Davisson and Germer experiment – Schrodinger Wave Equation – Wave function and its Physical Significance - Particle in one dimensional potential box(wave functions, probability densities and energy states).

UNIT- II Free Electron Theory Of Metals:

Classical Theory, Electrical Conductivity and Ohm's Law – Drawbacks, Sommerfield theory (Qualitative), Density of States, Effect of temperature on the Fermi-Dirac distribution.

Band Theory Of Solids:

Electron in a periodic potential – Bloch Theorem - Kronig-Penney model (Qualitative) – Origin of energy band formation in solids – Classification of materials into conductors, semiconductors & Insulators - Concept of effective mass of an electron.

UNIT- III Semiconductor Physics:

Fermi level in Intrinsic and Extrinsic semiconductors - Intrinsic semiconductor and carrier concentration – Extrinsic semiconductor and carrier concentration – Characteristics of p-n junction diode - Hall effect, LED, Photodiode.

Fibre Optics

Basic principle of optical fibre, Acceptance angle, Acceptance cone, numerical aperture (Quantitative), Types of optical fibre, applications of optical fibre.

UNIT IV Lasers:

Characteristics of Lasers – Spontaneous and Stimulated Emission of radiation, meta stable state, population inversion, lasing action, Einstein's coefficients and relation between them — Ruby Laser – Helium-Neon Laser –Semiconductor Laser – Applications of lasers.

UNIT V Basic Principles Of Nano Science:

Introduction, surface to volume ratio, quantum confinement – Fabrication of nano materials- Top down fabrication, Bottom up fabrication: sol-gel Technique, CVD method– Characterization (XRD & TEM) - Applications of nanomaterials.

Text Books:

1. Engineering Physics by P K palanisamy :Scietech publication
2. Solid State Physics by M Armugam; Anuradha Publications

Reference Books:

1. Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons
2. Engineering Physics by R.K.Gaur and S.L.Gupta; Dhanpat Rai and Sons

3. Engineering Physics by V Rajendran; McGraw hill education private ltd.
4. A Text book of Engineering Physics by M N Avadhanulu, P G Kshirsagar; S Chand
5. Engineering Physics by K Malik, A K Singh; Tata Mc Graw hill book publishers
6. Engineering Physics by M.R.Srinivasan, New Age Publishers

Course Outcomes:

- Having the knowledge of semiconductors & fiber optics, there will be a chance to know their applications.
- There will be a chance for them to use the subject as a mathematical tool to solve their real life problems.
- The students will be able to know the working of different lasers & their real life applications.

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(A52006)COMPUTER PROGRAMMING - II

Course Objectives:

- To explain various sorting and searching techniques
- To explain structures, unions, and enumeration types and operations on them
- To understand dynamic memory management using pointers.
- To introduce basic data structures such as stacks, queues and linked lists.
- To explain various types of files in 'C' Language.

UNIT - I

Searching and Sorting – Sorting- selection sort, bubble sort, Insertion sort, Quick Sort, Merge sort, Searching-linear and binary search methods.

UNIT - II

Structures - Declaration, initialization, accessing structures, operations on structures,nested structures, arrays of structures, Unions, Enumerated types, Type Definition(typedef), C programming examples.

UNIT - III

Pointers – Concepts, declarations, usage, pointers to pointers, pointer expressions, Arrays and Pointers, array of pointers,parameter passing of pointers, pointers to void, pointers to functions, structures through pointers, self referential structures, C programming examples

UNIT - IV

Lists- Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Push and Pop Operations, Queues- Enqueue and Dequeue operations.

UNIT - V

Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files,State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files), file status functions (error handling),Positioning functions, command –line arguments, C program examples.

Text Books:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh , Oxford University Press.

Reference Books:

1. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
2. C for All, S. Thamarai Selvi, R.Murugesan, Anuradha Publications.
3. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, 7th Edition, Pearson education.
4. Programming in C, Ajay Mittal, Pearson.
5. Programming with C, B.Gottfried, 3rd edition, Schaum's outlines, TMH.
6. Problem solving with C, M.T.Somasekhara, PHI
7. Programming with C, R.S.Bickar, Universities Press.
8. Computer Programming & Data Structures, E.Balagurusamy, 4th edition, TMH.

Course Out Comes:

- Upon completion of this course the students will have an:

- Ability to design various sorting and searching techniques
- Ability to design user defined data types to solve real world problems
- Ability to manage heap memory
- Ability to implement and use data structures like stacks, queues and linked lists
- Ability to create and use various types of files in 'C' Language.

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(A52008)MATHEMATICS-III

(Numerical Techniques and Partial Differential Equations)

Course Objectives:

- Determination of roots of an equation and calculate some simple methods of obtaining approximate roots of algebraic and transcendental equations.
- Interpolate the values using the techniques of Newton's forward and backward, Gauss forward and backward, Lagrange's and spline interpolations.
- Analyze and calculate numerical differentiation and numerical integration methods.
- Calculate sol of ODE using Taylor's, Euler's, Picard's, Runge Kutta and Predictor-Corrector method.
- Evaluate the sol of PDE and calculate boundary value problems.

UNIT-I:

Solution of Non-linear Equations and Linear System of Equations.

Solution of Algebraic and Transcendental Equations – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

Solving system of non-homogeneous equations by L-U Decomposition method (Crout's Method) Jacobi's and Gauss-Seidel Iteration method,

UNIT-II:

Interpolation:

Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences – Central differences – Symbolic relations and separation of symbols- Difference Equations - Differences of a polynomial-Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae – Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

UNIT-III:

Numerical Differentiation, Numerical Integration & Curve fitting

Numerical Differentiation, Generalized Quadrature (Newton's Cote's formula), Trapezoidal, Simpson's and Weddle's rules and problems. Curve fitting: Fitting a straight line – Second degree curve – exponential curve-power curve by method of least squares.

UNIT – IV:

Numerical solution of IVP's in ODE

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods – Predictor-Corrector Methods- Adams-Bashforth Method-Milne-Thomson Method.

UNIT-V:

Partial differential equations

Introduction and Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and nonlinear (Standard type) equations, Charpit's Method, Method of separation of Variables for second order equations. Classification of general second order partial differential equations. Applications of Partial Differential Equations-One dimensional wave equation, Heat equation.

Text Books:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th Edition, New Delhi, Khanna Publishers.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
3. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

Reference Books:

1. Shahanaz Bathul (2007), Mathematical Methods, 3rd Edition, Hyderabad, Right Publishers.
2. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House.
3. Introductory Methods of Numerical Analysis. S.S. Sastry, Prentice Hall.
4. Numerical Analysis (Paper IV), First Edition 2010, Telugu Akademi, Hyderabad.
5. Schaum's outline series on Matrices.
6. Mathematical Methods of Science and Engineering (Aided with Matlab) Kanti B.Datta (2012), Seventh Edition, CENGAGE Learning.

Course Outcomes:

- Determination of roots of an equations of the form $f(x)=0$ has great importance in the fields of science and engineering. Calculate some simple methods of obtaining approximate roots of algebraic and transcendental equations.
- Solutions of linear system of equations can be found by numerical methods known as direct and indirect methods such as Gauss elimination and its modifications ,Jacobi's and Gauss -seidal iterative methods, made the difference between of those methods.
- Interpolate the values using the techniques of Newton's forward and backward, Gauss forward and backward, Lagrange's interpolation, and spline'sinterpolation..
- Analyze and calculate numerical differentiation and numerical integrations methods.
- Calculate solutions of ODE using Taylor's, Euler's, picard's, Runge-Kutta, Predictor and corrector methods.
- Calculate boundary value problems
- Calculate Solutions of partial differential equation

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(A52011)ENGINEERING GRAPHICS

Course Objectives:

- To visualize and communicate geometrical elements like Polygons, Curves, Conic Sections, Cycloids and Involutives
- To understand the fundamentals of geometry like Orthographic Projections and its applications in design and manufacturing of various engineering components.
- To understand the fundamentals of geometry like Principles involved in Planes and Solids and its applications in design and manufacturing of various engineering components.
- To understand the fundamentals of geometry like Isometric Projections and its applications in design and manufacturing of various engineering components.
- To understand the fundamentals of geometry like Conversion of Orthographic Views to Isometric Views and its applications in design and manufacturing of various engineering components.

UNIT – I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, use of pencils, Lettering, Rules of dimensioning.

Construction of polygons: Inscription and superscription of polygons given the diameter of circle.

Curves used in Engineering Practice and their Constructions:

Conic Sections: Ellipse, Parabola, Hyperbola including the Rectangular Hyperbola - General method only.

Cycloidal curves - Cycloid, Epicycloid and Hypocycloid

Involutives

UNIT – II

Drawing of Projections or Views (Orthographic Projection in First Angle Projection Only): Principles of Orthographic Projections – Conventions – First and Third Angle Projections, Projection of Points, Projection of Lines - inclined to both planes, True lengths. (Mid points & Traces are eliminated).

UNIT – III

Projections of Planes: Projections of regular Planes – Inclined to both planes.

Projections of Solids: Projections of Regular Solids – Regular Polyhedra, solids of revolution, Axis inclined to both planes – Change of position.

UNIT –IV

Isometric Projections/views: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines.

UNIT –V

Conversion of Orthographic Views to Isometric Views of simple objects.

Transformation of Projections: Conversion of isometric views to orthographic views of simple objects.

Text Books:

1. Engineering Drawing, N.D. Bhatt / Charotar publishers

2. Engineering Drawing, K.L.Narayana and Kannaiah / Scietech publishers.

Reference Books :

1. Engineering Drawing, K.Venugopal/G.Sreekanjana, New Age International Publishers.

Course Outcomes:

- To Know the importance of Engineering Graphics and to represent the various Polygons, Curves, Conic Sections, Cycloids and Involute used in Engineering Graphics.
- To Draw and understand the Principles involved in Orthographic Projections and to represent the Principles involved in Points, Lines and Traces.
- To Draw and understand the construction Principles involved in Planes and Solids.
- To Draw and understand the construction Principles involved in Isometric Projections.
- To Draw and understand about Conversion of Orthographic Views to Isometric Views and also represent its Transformation of Projections

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(A52217)ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-II

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Course Objectives

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Syllabus: English Language Communication Skills Lab shall have two parts:

1. **Computer Assisted Language Learning (CALL) Lab**
2. **Interactive Communication Skills (ICS) Lab**

The following course content is prescribed for the English Language Communication Skills Lab

Exercise-I

CALL Lab: Minimal Pairs

Word accent and Stress Shifts

Listening Comprehension

Exercise-II

ICS Lab: Descriptions- Narrations- Giving Directions and Guidelines

Question Tags and One-Word Substitutes

Concord (Subject in agreement with verb) and Words often misspelt- confused/misused

Exercise-III

CALL Lab: Intonation and Common Errors in Pronunciation.-Neutralization of Mother Tongue Influence and Conversation Practice.

Exercise-IV

ICS Lab: Extempore- Public Speaking

Active and Passive Voice,

Common Errors in English,

Idioms and Phrases

Exercise-V

ICS Lab: Information Transfer

Oral Presentation Skills

Reading Comprehension

Job Application with Resume preparation.

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor

a) Speed – 2.8 GHZ

b) RAM – 512 MB Minimum

c) Hard Disk – 80 GB

ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

Text Books:

1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
2. Strengthen Your Steps - Dr. M. Hari Prasad and others, Maruthi Publications
3. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
4. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
5. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
6. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013 Orient Blackswan. Hyderabad.
7. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
8. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
9. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi : Foundation
10. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
11. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
12. English Pronouncing Dictionary Daniel Jones Current Edition with CD.
13. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)
14. Lab Manual: A Manual entitled “English Language Communication Skills (ELCS) Lab Manual- cum- Work Book”, published by Cengage Learning India Pvt. Ltd, New Delhi. 2013

Course Outcomes:

- Better Understanding of nuances of language through audio- visual experience and group activities

- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

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(A52218)COMPUTER PROGRAMMING-II LAB

Course Objectives:

- To make the student to implement various sorting and searching techniques
- To introduce the student to structures, unions, and enumeration types and operations on them
- To introduce the student dynamic memory management using pointers.
- To introduce basic data structures such as stacks, queues and linked lists.
- To make the student to create various types of files in 'C' Language.

Week 1:

Review of Arrays and functions.

Week 2:

Write programs to illustrate the implementation of Bubble Sort and Selection Sort

Week 3:

Write programs to illustrate the implementation of Insertion Sort and Quick Sort

Week 4:

Write programs to illustrate the implementation of Merge Sort.

Week 5:

Write programs to illustrate the implementation of Binary Search and Linear Search.

Week 6 & 7:

Write programs to illustrate the various concepts of structures

Week 8:

Write programs to illustrate the concepts of accessing variables using pointers

Week 9:

Write programs to illustrate the implementation of call by reference

Week 10:

Write programs to illustrate the implementation of arrays using pointers

Week 11:

Write programs to implement structures using pointers

Week 12:

Write program to illustrate the implementation of Single Linked List

Week 13:

Write programs to illustrate Stack operations using arrays and pointers

Week 14:

Write programs to illustrate Queue operations using arrays and pointers

Week 15:

Write programs to illustrate the various concepts of files.

Week 16:

Review

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L	T/P/D	C
0	-/3/-	2

(A52219)ENGINEERING PHYSICS LAB

1. Diffraction Grating with sodium vapor lamp
2. Single Slit with laser source
3. Newton's Rings
4. Energy gap of a semiconductor material
5. Torsional Pendulum Expt. to determine the rigidity modulus of material of a wire
6. Seebeck Effect
7. Decay of charge - R C circuit and time constant
8. L C R Series circuits
9. Dispersive Power of the material of a Prism using Spectrometer
10. Stewart & Gee's experiment
11. LED Characteristics
12. Numerical Aperture of an Optical Fibre & Bending losses of an Optical Fibre
13. Diffraction Grating with laser source

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0	-/3/-	2

(A52220)ENGINEERING WORKSHOP

Course Objectives:

1. To impart the knowledge regarding the various techniques, skills and tools necessary for engineering workshop practice.
2. To provide the students with hands on experience on different trades of engineering workshop like carpentry, tin-smithy, fitting, welding and house wiring.
3. To learn about the machines in view of constructions details, different operations to be performed on the machines and different tools.
4. To enhance the practical approach towards machine tools.
5. To introduce the concepts of power tools in constructions , wood working, electrical engineering and mechanical engineering in manufacturing applications

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-smithy and development of jobs carried out and soldering.
4. House-wiring
5. Welding

2. TRADES FOR DEMONSTRATION&EXPOSURE:

1. Plumbing
2. Machine shop
3. Power tools in construction, wood working, electrical engineering and mechanical engineering.

Course Outcomes:

1. To make a lap joint.
2. To make a dovetail- joint.
3. To make a T-bridle joint.
4. To prepare a flat filing.
5. To prepare a step cutting.
6. To prepare a angular cutting.
7. To prepare a open scoop.
8. To prepare a rectangular tray.
9. To prepare a square tin.
10. To understand and to give the connections for one light point control by one single pole switch .
11. To understand and to give the connections for one light point control by two-two way switches (parallel connections).
12. To understand and to give the connections for to-connect a electrical bell by using bell-push.
13. To understand and to give the connections for two light point controlled by one single pole switch.
14. To prepare a pipe joint,tap and pressing- connections by using plumbing.

15. To apply different operations to be performed on the lathe machines.
16. To prepare a switch boards , wood drilling and threading different various sizes.

Text Books:

1. Work shop manual - P.Kannaiah/K.L Narayana/scitech publishers.
2. Workshop manual by Venkat Reddy

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II Year B.Tech. CSE – I Sem

L	T/P/D	C
3	1	3

(A53020)PROBABILITY AND STATISTICS

Course Objectives:

- Understand a random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type.
- In the discrete case, study of binomial and the poisson random variables and the normal random variable for the continuous case predominately describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- Most of the random situations are described as functions of random many single random variables. In this unit the objective is to learn functions of many random variables through joint distributions.
- The types of sampling, sampling distributions of means, sampling distributions of variance estimations of statistical parameters, testing of hypothesis of few unknown statistical parameters.
- The random processes, the classification of random processes, markov chain, classification of states.
- Stochastic matrix (transition probability matrix), limiting probabilities application of markov chains.
- Understanding the experiment and the design of experiment.

UNIT-I

Probability: Sample space and events, Classical and Statistical definition of Probability, the axioms of probability, Some Elementary theorems of Probability, Conditional probability, Baye's theorem. Random variables, Discrete and continuous random variable

UNIT-II

Definitions of Probability Distribution function, Probability mass function, Probability density function and properties. Definitions of Mathematical expectation, Moments (about origin & Centre), Definition of moment generating function for discrete and continuous random variable. Discrete Distributions: Binomial and Poisson distributions (definition and problems) their mean, variance and moment generating function. Continuous Distribution: Normal and exponential distributions (definition and problems) related properties

Concepts of Joint Distribution function of more than one random variable, Definition of joint, marginal and conditional distribution (for two variables only).

UNIT-III

Sampling distribution: Populations and samples - Sampling distributions of mean (σ known and unknown)

Estimation: Concept of Point estimation and its properties (definition only), Concept of interval estimation with examples.

Test of Hypothesis: Null & Alternative Hypothesis, Critical region, Type I and Type II errors, level of significance, one tail, two-tail tests.

Large sample test: concerning means – proportions (One and Two samples).

UNIT-IV

Small sample test: Chi-Square test, Student's t-test (Single mean, Difference of mean and

Paired samples) and F-test.

Design of Experiment: Introduction to ANOVA (one – way, two – way), Principles of Design of Experiment, completely randomized design (CRD), randomized complete block design (RBD), Latin Square Design (LSD). (No Derivations only concept, definitions and problems)

UNIT-IV

Stochastic Process: Introduction to stochastic Process, Classification of Random Processes, Stationary and non-stationary random process, Stochastic Matrix.

Markov Chain: Classification of States, Classification of chains, Random Walk and Gambler Ruin.

Text Books:

1. Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press.
2. Probability and Statistics for Engineers by Richard A Johnson, Pearson Education.
3. Introduction to Probability by Charles M Grinstead, J Laurie Snell, American Mathematical Society

Reference Books:

1. A.V. Skorokhod, Basic Principles and Applications of Probability Theory, Springer.
2. Arnold O. Allen, Probability & Statistics, Academic Press.
3. Hwei P. Hsu, Theory and Problems of Probability, Random Variables, and Random Processes, Schaum's Outline Series, McGraw- Hill.
4. Mendan Hall, Probability & Statistics, Beaver Thomson Publishers.
5. Miller and John E. Freund, Probability & Statistics for Engineers, Prentice Hall of India.
6. Montgomery: Design and Analysis of Experiments, Wiley.
7. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, JohnWiley& Sons, Ltd.
8. Zivorad R. Lazic, Design of Experiments in Chemical Engineering, Wiley-VCH.

Course Outcomes:

- Students would be able to identify distribution in certain realistic situation. It is mainly useful for circuit as well as non circuit branches of engineering and also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
- The student would be able to calculate mean and proportions (small and large samples) and to make important decisions from few samples which are taken out of unmanageably huge populations; it is mainly useful for non circuit branches of engineering.
- The student would be able to understand about the random process, markov process and markov chains which are essentially models of many time dependent process such as signals and communications, time series analysis.
- The student would be able to find the limiting probabilities and the probabilities in n^{th} state it is quite useful for all branches of engineering.

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3	1	3

(A53021)DISCRETE MATHEMATICS

Course Objectives:

- To explain with examples the basic terminology of sets, relations, and functions
- To perform operations associated with sets, relations, and functions
- To describe logical inferences, first order logic, and mathematical induction
- To describe combinatorics
- To describe recurrence relations
- To use graph theory for solving problems

UNIT-I

Foundations: Basics, Sets, Proofs and Problem Solving Strategies, Fundamentals of Logic, Logical Inferences, Methods of Proof of an Implication, First order logic and Other methods of Proof, Rules of Inference for Quantified Propositions

UNIT-II

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumerating Combinations and Permutations with & without repetitions, Constrained repetitions, Binomial Coefficients, Binomial Theorem and Multinomial Theorem and Principle of Inclusion and Exclusion, Balls & Bins, Paradigm.

UNIT-III

Recurrence Relations: Generating Functions, Calculating coefficient of Generating Function, Solving Recurrence relations by substitution method and Generating Functions, The Method of Characteristic Roots, Solutions to inhomogeneous recurrence relations

UNIT-IV

Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary Relations, Equivalence Relations, Ordering Relations, Lattice, and Enumerations, Operations on Relations, Paths and Closures, Directed Graphs and Adjacency matrices, topological sorting.

UNIT-V

Graphs - Basic Concepts, Isomorphism's and Sub-graphs, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

1. "Discrete Mathematics for Computer Scientists and Mathematicians" by Joe L. Mott, Abraham Kandel, Theodore P. Baker, Second Edition, PHI.

Reference Books:

1. "Discrete Mathematics and its Applications", Kenneth H Rosen, Tata McGraw
2. "Probability and computing, Randomized Algorithms and Probabilistic Analysis" Michel Mitzenmacher, Eli Upfal CAMBRIDGE.
3. Tremblay J P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill Publishing Company Limited, New Delhi, 2007
4. Discrete Computational Structures: Robert R. Korfhage , Academic Press, Second Edition(1984).

5. Rings, Fields and Groups: An Introduction to Abstract Algebra: Reg Allenby, Second Edition (1999)
6. Elements of Discrete Mathematics: L CL Liu, McGraw-Hill, First Edition(1985)
7. Discrete Mathematical Structures for Computer Science: Bernard Kolman, Robert Busby, PHI, First Edition (1987)
8. First look at graph theory: John Clark & Derek Allan Holton, Allied Publishers First Edition (1995)
9. Graph Theory with Applications to Engineering & Computer Science: NarsinghDeo, PHI (2004)

Course Outcomes:

- Ability to illustrate by examples the basic terminology of functions, relations and sets and demonstrate knowledge of their associated operations.
- Ability to demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusions/exclusion and the pigeonhole methodology
- Ability to understand recurrence relations and its applications related to computer sciences
- Ability to represent and apply graph theory in solving computer science problems

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4	0	4

(A53022)DATA STRUCTURES

Course Objectives:

- To understand the basic concepts such as Abstract Data Types, Linear and Non Linear Data structures.
- To understand the behavior of data structures such as stacks, queues, trees, hash tables, search trees, Graphs and their representations.
- To choose the appropriate data structure for a specified application.
- To write programs in C to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables, search trees

UNIT-I

Introduction: What is data structure, Types of data structures, Static and Dynamic representation of data structure and comparison. Stacks: Stacks definition, operations on stacks, Applications of Stacks: Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack

UNIT-II

Trees: Basic terminology, Types of trees: Binary Tree: terminology, Complete and Full Binary Tree, Extended Binary Trees, Threaded Binary Trees and In order Threading. Representation of Trees using Arrays and Linked lists (advantages and disadvantages). Tree Traversal and Representation of Algebraic expressions; Algorithms for Tree Traversals

UNIT-III

Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Algorithm for Inserting, Selecting and Searching in BST. Representation and advantages of AVL Trees, Algorithms on AVL Trees-Insertion, Rotation and Deletion. Definition and advantages of B-trees, B + Trees, Red-Black Trees, M-way trees with examples

UNIT-IV

Graphs-Basic terminology, Representation of graphs: sequential representation (Adjacency, Path Matrix) Linked representation.

Graph Traversals-Breadth First Search, Depth First Search with algorithms. Definition and properties of Spanning Tree, Minimum Spanning Tree, Dijkstra Algorithms

UNIT-V

Hashing: General Idea, Hash Functions, Separate Chaining ,Open Addressing-Linear probing, Quadratic Probing, Double Hashing, Rehashing, Extensible Hashing, Collisions in Hashing, Implementation of Dictionaries

Text Books:

1. "Data Structures, A Pseudo code Approach with C, Richard F.Gillberg&Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition, 2005.
2. Data Structures, Seymour Lipschutz, Schaum's Outlines, Tata McGraw-Hill, Special Second Edition

Reference Books:

1. "Data Structures Using C and C++", Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, Delhi India.

2. "Fundamentals of Data Structures", Horowitz and Sahani, Galgotia Publications Pvt Ltd Delhi India.
3. Data Structure Using C, A.K. Sharma , Pearson Education India.
4. "Data Structure Using C and C++", Rajesh K. Shukla, Wiley Dreamtech Publication.
5. "Data Structures", Lipschutz, Schaum's Outline Series, Tata Mcgraw-hill Education (India) Pvt.Ltd .
6. "Data Structures and Algorithms in C++", Michael T. Goodrich, Roberto Tamassia, David M. Mount, Wiley India.

Course Outcomes:

- Learn how to use data structure concepts for realistic problems.
- Ability to identify appropriate data structure for solving computing problems in respective language.
- Ability to solve problems independently and think critically.

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(A53023)ELECTRONIC DEVICES AND CIRCUITS

Course Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers this course focuses:

- To familiarize the student with the principle of operation analysis and design of junction diode BJT and FET amplifier circuits transistors and field effect transistors.
- To understand diode applications.
- To study basic principle of filter circuits and various types.

UNIT-I

P-N Junction Diode And Rectifiers: Quantitative Theory of p-n junction, p-n junction as diode, diode equation, volt-ampere characteristics, temperature dependence of V_I characteristic, transition and diffusion capacitances, diode equivalent circuits, breakdown mechanisms in semi-conductor diodes, Zener diode characteristics, Principle of operation and characteristics of Tunnel Diode, Schottky Barrier Diode.

The p-n junction as a rectifier, half wave rectifier, full wave rectifier bridge rectifier harmonic components in a rectifier circuit, inductor filters, capacitor filters, L-section filters, π -section filters, comparison of filters, voltage regulation using zener diode, SCR

UNIT-II

Bipolar Junction Transistor And Field Effect Transistor: The junction transistor, transistor current components, transistor construction, BJT operation, BJT symbol, Transistor as an amplifier, common base, common emitter and common collector configurations, limits of operation, BJT specifications.

The junction field effect transistor (construction, principle of operation, symbol)- pinch –off Voltage –Volt –Ampere characteristics, the JFTE small signal model, MOSFET (construction, principle of operation, symbol) MOSFET characteristics in enhancement and depletion modes.

UNIT-III

Transistor Biasing And Stabilization: Operating point, the DC and AC load lines, need for biasing, fixed bias, collector feedback bias, emitter feedback bias, collector emitter feedback bias, voltage divider bias, bias stability, stabilization factors. Stabilization against variation in v_{3E} and β , bias compensation using diodes and transistors. Thermal runaway, stability, biasing FET

UNIT-IV

BJT and FET Amplifiers: BJT Hybrid model, determination of h-parameters from transistor characteristics, analysis of a transistor amplifier circuit using h-parameters, comparison of a transistor amplifier circuit using h-parameters comparison of CB, CE and CC Amplifier configurations. FET Common source amplifier, common drain amplifier, generalized FET amplifier, FET, as voltage variable resistor, comparison of BJT and FET, the Unit junction transistor.

UNIT-V

Feed Back Amplifiers And Oscillators: Concepts of feedback Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on

Amplifier characteristics, Simple problems.

Oscillators: Condition for oscillations, RC and LC type oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz(Hartley, Colpitts), RC-phase shift and Wien-bridge oscillators.

Text Books:

1. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and SatyabrathaJit Tata McGraw Hill, 2nd Ed., 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9th Edition,2006.
3. Introduction to Electronic Devices and Circuits- Rober T. Paynter PE

Reference Books:

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition, 2004.
2. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn., 1998.
3. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
4. Electronic Devices and Circuits – Dr. K. Lal Kishore, B.S.

Course Outcomes:

- Understand and analyze the different types of diodes operation and its characteristics.
- Design and analyze the DC bias circuitry of BJT and FET.
- Design Biasing Circuit Using Diodes and transistors.
- To analyze and design diode application circuits amplifier circuits and oscillators employing BJT, FET devices

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L	T/P/D	C
3	1	3

(A53024)DIGITAL LOGIC DESIGN

Course Objectives:

- To understand basic number system code and logic gates.
- To understand the Boolean algebra and minimization logic.
- To understand the design of combinational sequential circuit.
- To understand the basic of various memory.

UNIT-I

Number Systems: Binary, Octal, Hex Decimal, and Conversions, range; Binary additions and subtractions (using 1c, and 2c), concept of overflow; representations of negative numbers using 1's and 2's complement and range; **BCD numbers:** Representation of 8421, 2421, Ex-3, Gray and self complementary codes; additions and subtractions on 8421 codes; **Error detecting codes:** even, odd parity, hamming codes; **Error correcting codes:** hamming codes, block parity codes; Floating point representation

UNIT-II

Boolean Algebra and Digital Logic GATES, Basic Boolean LAWS and properties; Boolean functions; canonical and standard forms (SOP, POS); Gate minimization using three and four variable K-Map's with and without don't cares. Encoders, Decoders, Multiplexers, D-Multiplexers

UNIT-III

Definition of combinational circuits, design procedure for half, full, decimal (8421) adders and sub tractors; Combinational Circuit Design for BCD code converters

UNIT-IV

Sequential circuits, latches, Flip Flops; Analysis of clocked sequential circuits, State Reduction and Assignment, Register, Ripple Counters, Synchronous Counters, Other Counters

UNIT-V

Types of Memory – Main memory – random access memory, ROM, Types of ROM; Decoder and RAM interface: Address lines, data lines, chip select signal; Design of large memories using small memories, using decoders; problems in memory design; Cache Memory- design issues, hit and miss ratio related problems; Associative and Auxiliary memory

Text Books:

1. Digital Design – Third Edition, M. Morris Mano, Pearson Education/PHI.
2. Fundamentals of Logic Design, Roth, Fifth Edition, Thomson.

Reference Books:

1. John F. Wakerly: Digital Design: Principles and Practices, 4th Edition, Pearson / Prentice Hall, 2005
2. Digital Principles and Applications By Malvino& Leach, Seventh Edition, McGraw-Hill Education
3. Digital Electronics: Principles and Integrated Circuits By A.K. Maini, Wiley India Publications
4. Digital Design M. Morris Mano and Michael D. Ciletti, Pearson Education

Course Outcomes:

- After this course student could able to design understand the number systems combinational sequential circuits and they should be in a position to continue with computer organization.

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L	T/P/D	C
4	0	4

(A53025)OBJECT ORIENTED PROGRAMMING

Course Objectives:

- To get a clear understanding of object-oriented concepts.
- To understand object oriented programming through C++

UNIT-I

Concepts of OOP: Introduction to OOP, Procedural versus Object Oriented Programming, Principles, Benefits and applications of OOP.

C++ Basics: Overview, Program structure, namespace, identifiers, variables, constants, enumerations, operators, typecasting, control structures.

UNIT-II

C++ Functions: Simple functions Call and Return by reference, Inline functions, Overloading of functions, default arguments, friend functions, and virtual functions.

Objects and classes: Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading

UNIT-III

Inheritance: Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.

Polymorphism: Pointers in C++, Pointers and Objects, this pointer, virtual and pure virtual functions, implementing polymorphism.

UNIT-IV

I/O Streams: Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators.

File management: File stream, C++ File stream classes, File management functions, File modes, sequential and random access files.

UNIT-V

Templates: Function and class templates, overloading of template functions.

Exceptions: Basics of exception handling, exception handling mechanisms, throwing, catching mechanisms, rethrowing an exception

Text Books:

1. The Complete Reference C++, Herbert Schlit, TATA McGraw Hill, Fourth Edition, 2003.
2. Object Oriented Programming in C++, SauravSahay, Oxford University Press, Second Edition, 2012.

Reference Books:

1. "Object Oriented Programming with C++, E Balagurusamy, TATA McGraw Hill, Sixth Edition, 2013.
2. C++ Programming, Black Book, Steven Holzner, dreamtech
3. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia
4. Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson

Course Outcomes:

- Gain the basic knowledge on Object Oriented concepts.
- Ability to develop applications using Object Oriented Programming Concepts.
- Ability to implement features of object oriented programming to solve real world problems

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II Year B.Tech. CSE – I Sem

L	T/P/D	C
0	3	2

(A53209)ELECTRONIC DEVICES AND ELECTRICAL CIRCUITS LAB

Course Objectives:

- To obtain the characteristics of the PN junction diode and Zener diode
- To obtain the input and output characteristics of Transistor in CB and CE Configuration.
- To understand the operation of half wave and full wave rectifiers without filters.
- To understand the operation of half-wave and full-wave rectifiers with filters.
- To obtain the FET Characteristics.
- To obtain the frequency response of CC and CE Amplifier.
- To obtain the frequency response of FET Amplifier

Part A:

1. Verification of Kirchoff's current law and Kirchoff's voltage law.
2. Verification of Superposition theorem.
3. Verification of maximum power transfer theorem for DC circuits.
4. Verification of Thevenin's theorem.
5. Characteristics of DC shunt generator.
6. Swinburne's test on DC shunt machine.
7. Brake test on DC shunt motor.
8. OC & SC tests on single phase transformer.
9. Brake test on 3 phase induction motor.

Part B:

1. PN Junction Diode characteristics.
2. Zener diode characteristics.
3. Transistor CE characteristics.
4. Rectifier without filters.
5. Rectifiers with filters.

NOTE:

Any 5 experiments from Part – A

All 5 experiments from Part – B

Course Outcomes:

- The course intends to provide an overview of the principles, operation and application of the basic electronic components.
- Understand the Characteristics of the active devices.
- To understand the frequency response of different amplifiers.

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L	T/P/D	C
0	3	2

(A53210)DATA STRUCTURES LAB

Course Objectives:

- To write and execute programs in c to solve problems using data structures such as arrays, linked list, stacks, queues, trees, graphs, hash tables and search trees.
- To write and execute write programs in c to implement various sorting and searching methods

Part-A

1. Program to illustrate string built in functions
2. Program to evaluate postfix notations
3. Program to convert infix to postfix notation
4. Program to illustrate tree traversals
 - a) In order
 - b) Preorder
 - c) Post order
5. Program to illustrate insertion , deletion and searching in Binary Search Tree.
6. Program to illustrate Graph traversals
 - a) Breadth First Search
 - b) Depth First Search
7. Program to illustrate Insertion, deletion and Rotation on AVL Trees.

Part-B

1. Program to illustrate Function Overloading to calculate area of a circle, rectangle and square
2. Program to illustrate virtual function
3. Program to illustrate default constructor, parameterized constructor and copy constructors
4. Program to illustrate single Inheritance, multiple inheritance, multilevel inheritance, hybrid inheritance
5. Program to illustrate run time polymorphism, compile time polymorphism
6. Program to illustrate Operator Overloading
 - a) Unary Operator
 - b) Binary Operator
7. Program to illustrate Exception Handling Mechanisms using try, catch, throw keywords
8. Program to illustrate formatted and unformatted I/O streams

Course Outcomes:

- Ability to identify the appropriate data structure for given problem.
- Graduate able to design and analyze the time and space complexity of algorithm or program.
- Ability to effectively use compilers includes library functions, debuggers, and trouble shooting

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0	2	1

(A53211)PERSONALITY DEVELOPMENT –I

1. Self Assessment

- SWOT
- Presentation of Action Plan
- Acquisition of Employability Skills
- Enhancement of Clarity in Communication
- Practical Activities

2. Motivation and Goal Setting

- Self Motivation
- Pushing yourself beyond imagination
- Role Model
- Practical Activities
- Goal Setting- Process
- Practical Activities

3. Self- Confidence

- Command on Language
- Command on Subject
- Self Efficacy
- Self Esteem
- Self Competence
- Practical Activities

4. Time Management

- Procrastination
- Prioritisation
- Valuing Others Time
- Setting Timelines
- Activities
- Practical Session

5. Etiquette and Grooming

- Personal Habits
- Dressing Sense
- Behavior Control
- General Etiquette
- Situational Courtesies
- Practical Sessions

6. Presentation Skills and Public Speaking

- Techniques of Presentation Skills
- Extempore Speaking
- Body Posture (Non-Verbal Communication)
- Personal Grooming
- Public Speaking
- Role Play on above topics

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3	0	3

(A54010)ENVIRONMENTAL STUDIES

Course Objectives:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding of environmental policies and regulation.

UNIT-I

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness. (a) Ecosystems: Concept of an ecosystem – Classification, structure and function of different ecosystems - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids.

(b) Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. ICUN categories of biodiversity and RED DATA book - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-II

Natural Resources: Renewable and non-renewable – Natural resources and associated problems: Forest resources – Use and over – exploitation, deforestation,– Timber extraction, mining, dams and other effects on forest and tribal people: Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources: Equitable use of resources for sustainable lifestyles.

UNIT-III

(a) Environmental Pollution: Definition, Cause, effects and control measures of different kinds of pollution (Air, Water , Soil , Marine , Noise , Thermal, Nuclear, e –Waste)

(b) Social Issues and the Environment: From Unsustainable to Sustainable development - Urban problems related to energy -Water conservation, rain water harvesting, and watershed management. -Climate change, global warming, ozone layer depletion, nuclear accidents and holocaust.

UNIT-IV

(a) Waste management technology: Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution, Disaster management: floods, earthquake, cyclone and landslides. Waste water and sewage treatment technology: primary, secondary and tertiary treatments. Bioremediation, Phyto-remediation, ZLD (zero liquid discharge), membrane technology.Application of GIS and GPS

system in environmental science.

(b) Environmental policy, Rules and regulations. EIA (Environmental Impact Assessment) & EMP (ENVIRONMENTAL Management Plan) – Environment Protection Act. - Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act - Wildlife Protection Act –Forest Conservation Act.-Public awareness. Global environmental problems and global efforts

UNIT-V

(a) Towards sustainable future: concept of sustainable development, threats of sustainability, population and its explosion, over exploitation of resources, strategies for achieving sustainable development. Environmental education, Conservation of resources. Urban sprawl, sustainable cities and sustainable communities, human health. Role of IT in environment, environmental ethics, concept of green building, Basic principles of Green engineering, clean development mechanism (CDM), Low carbon life cycle, Polluters-pay principle.

(b) Field work: Visit to a local area to document environmental assets River/forest grassland/hill/ mountain Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds, Visit to effluent treatment plant/sewage treatment plant Study of simple eco systems pond, river, hill slopes, etc. Mini projects by students which is mandatory

Text Books:

1. Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission, University Press.
2. Environmental studies, From Crisis to cure by R.Rajagopalan,2005

Reference Books:

1. Environmental Science: towards a sustainable future by Richard T.Wright.2008 PHL Learning Private Ltd .New Delhi
2. Environmental Engineering and science by Gilbert M.Masters and Wendell P.Ela.2008 PHI Learning Pvt. Ltd.

Course Outcomes:

- Based on this course the engineering graduates will understand/evaluate develop technologies on the basis of ecological principles and environment regulations which in turn help in sustainable development

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(A54022) FORMAL LANGUAGES AND AUTOMATA THEORY

Course Objectives:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

UNIT-I

Fundamental concepts: Strings, Alphabets, Language operations, Regular Expressions, Regular Languages: Finite automata, Types of finite automata (FA)-Non deterministic Finite Automata (NFA), Deterministic Finite Automata(DFA), NFA with E-Moves, RE to NFA; NFA with ϵ -Moves to NFA without ϵ -Moves; NFA to DFA Conversions; Minimization of DFA: (Proofs Not Required)

UNIT-II DFA with more than two outputs: Moore and Melay machines, Pumping Lemma for Regular Sets: Closure properties of Regular Sets (Proofs Not Required): Context Free Grammars (CFG), Right most, Left most –derivations, Parse Trees; Operator Grammar: Unit productions; Chomsky normal forms; (Proofs Not Required)

UNIT-III Left recursion and Elimination of left recursion in CFG: Elimination of useless symbols and unit productions; Greibach Normal Form, Push Down automata (PDA): Types of PDA: Design of a PDA for a given CFG. (Proofs Not Required)

UNIT-IV Regular Grammars (RG), Design of DFA for a given RG: Right linear and left linear Grammars and conversions: Definition of Context Sensitive Grammar (CFG) and Linear bounded automata (LBA) (Proofs Not Required)

UNIT-V Definition of unrestricted Grammar and Turing Machine (TM): Chomsky hierarchy on Languages, Grammars and recognizers; Design of TM as recognizer; Types of TM: Computational problems of TM with multiple tracks; Decidability Problem; Churches hypothesis (Proofs Not Required)

Text Books:

1. Introduction to Automata Theory, Languages and Computation, John E.Hopcroft, Rajeev Motwani , Jeffrey D.Ullman, Pearson, Third Edition.
2. Theory of Computation, VivekKulakarni, Oxford University press 2013, Second impression 2014

Reference Books:

1. Introduction to Computer theory, Daniel I.A.Cohen, John Wiley.
2. Introduction to languages and the theory of Computation, John C Martin, TATA McGraw HilCourse

Course Outcomes:

- Graduate should be able to understand the concept of abstract machines and their power to recognize the languages.
- Attains the knowledge of language classes & grammars relationship among them with the help of Chomsky hierarchy.
- Graduate will be able to understanding the pre-requisites to the course compiler or advanced compiler design.

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(A54023)COMPUTER ORGANIZATION

Course Objectives:

- To understand basic components of computers.
- To explore the I/O organizations in depth.
- To explore the memory organization
- To understand the basic chip design and organization of 8086 with assembly language programming.

UNIT-I

Instruction: Instruction Definition, instruction cycle, instruction storage, types of instruction formats (Zero, one, two and three address). **Addressing modes:** mode field, implied, immediate register, register direct, register indirect, auto increment, decrement, indexed, relative, base address mode, Numerical examples and problems

UNIT-II

CPU-Organization: 8086 – CPU – Block diagram and pin diagram, concept of pipelining, minimum and maximum mode, segment register and generation of 20 bits address, concept of address, data, control and systems bus, Types of flags.

UNIT-III

CPU and Main Memory interface, programming the basic computer – Machine Assembly Languages. **Assembler:** basic assembly language instructions (ADD, SUB, LOAD, STORE, MOV, CMP, JUMP). **Micro-programmed control:** control memory, address sequencing, micro program example, and design of control unit.

UNIT-IV

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus. **Modes of Transfer:** Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy- Chaining priority. **DMA:** DMA Controller, DMA Transfer, Intel 8089 IOP.

UNIT-V

Multi Processors: Characteristics of Multi Processor; Interconnection structures: Time shared common bus, multiport memory, crossbar switch, multi-stage switching network; Introduction to Flynn's classification: SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

1. Computer System Architecture – M.Morris Mano, Third Edition, Pearson/PHI, 2011.
2. Microprocessor and Interfacing – Douglas V Hall, Second Edition, TATA McGraw Hill, 2006.

Reference Books:

1. Computer Organization – Carl Hamacher, ZvonksVranesic, SafeaZaky, V Edition,McGraw Hill.
2. Computer Organization and Architecture – William Stallings, 6th Edn.Pearson/PHI.

Course Outcomes:

- After this course students understanding a better way the I/O and memory organization in depth. They should be in a position to write assembly language programs for various applications

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(A54024)DATABASE MANAGEMENT SYSTEMS

Course Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- To understand the relational database design principles.
- To become familiar with the basic issues of transaction processing and concurrency control.
- To become familiar with database storage structures and access techniques

UNIT-I

Introduction to Database System Concepts: Database-System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Spatial Databases, Database Users and Administrators, History of Database Systems

RELATIONAL DATABASES Introduction to the Relation Models: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations. **Introduction to SQL:** Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions Nested sub-queries, Modification of the Database

UNIT-II

Intermediate SQL: Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas, Authorization. **Advanced SQL:** Functions and Procedures, Triggers, Cursors. **Formal Relational Query Languages:** The Relational Algebra, the tuple Relational Calculus, the Domain Relational Calculus.

UNIT-III

Database Design: Database Design and the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features, Alternative Notations for Modeling Data, Other Aspects of Database Design. **Relational Database Design:** Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional-Dependency Theory, Algorithms for Decomposition, Decomposition Using Multi valued Dependencies, More Normal Forms, Database - Design Process.

UNIT-IV

Data Storage And Querying: Storage and File Structure: Overview of Physical Storage Media, Magnetic Disk and Flash Storage, RAID, Tertiary Storage, File Organization, Organization of Records in Files Data-Dictionary Storage, Database Buffer. **Indexing and Hashing:** Basic Concepts, Ordered Indices, B+ Tree Index Files, B+ Tree Extensions, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Index Definition in SQL.

UNIT-V

Transaction Management: Transactions: Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation,

Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels, Implementation of Isolation Levels, Transactions as SQL Statements. **Concurrency Control** : Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multi version Schemes, Concurrency in Index Structures.

Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, Early Lock Release and Logical Undo Operations, ARIES, Remote Backup Systems.

Text Books:

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Sixth Edition, Tata McGraw-Hill.
2. Database Management System, Raghu Rama Kirshna, Johannes Gchrke, TATA MC Graw Hill Third Edition.

Reference Books:

1. Data base Systems design, Implementation and Management Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems Elmasri Navrate Pearson Education

Course Outcomes:

- Demonstrate the basic elements of a relational database management system,
- Ability to identify the data models for relevant problems.
- Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data.
- Apply normalization for the development of application soft wares
- Graduate will be able to understanding the pre-requisites to the course compiler or advanced compiler design.

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(A54025)SOFTWARE ENGINEERING

Course Objectives:

- To understanding of software process models such as waterfall and evolutionary models.
- To understanding of software requirements and SRS document.
- To understanding of different software architectural styles.
- To understanding of software testing approaches such as unit testing and integration testing.
- To understanding on quality control and how to ensure good quality software.

UNIT-I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), personal and team process models.

UNIT-II

Process models: The waterfall model, Incremental process models, Evolutionary process model, Agile process. Software Requirements: Functional and non-functional requirements, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management

UNIT-III

System models: Context Models, Behavioral models, Data models, Object models, structured methods. Design Engineering: Design process and Design quality, Design concepts, the design model, Modeling component level design: design class based components, conducting component level design. Performing User interface design: Golden rules.

UNIT-IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, Product metrics : Software Quality, Metrics for Analysis Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for maintenance.

UNIT-V

Metrics for Process and Products: Metrics for software quality. Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education

Reference Books:

1. Software Engineering- K.K. Agarwal&Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, JohnWiely.

3. Systems Analysis and Design- ShelyCashmanRosenblatt,Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies

Course Outcomes:

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain ,efficient, reliable and cost effective software solutions
- Ability to critically thinking and evaluate assumptions and arguments.

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(A54026)JAVA PROGRAMMING

Course Objectives:

- To understand object oriented programming concepts, and apply them in problem solving.
- To learn the basics of java Console and GUI based programming

UNIT-I

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming- Objects and Classes, Data abstraction and encapsulation, inheritance, Polymorphism, Data binding, Message Communication, Benefits of OOP, Applications of OOP. **Java Basics** History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, Strings

UNIT-II

Inheritance – Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, Object class **Packages and Interfaces** : Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, File, Byte Streams, Character Streams, Stream I/O.

UNIT-III

Exception handling - Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Package java.util- The Collection Interface, list interface, Queue interface, The Collection class: Linked List Class, Hash Set Class. Tree Set Class, String Tokenizer, Date, Random, Scanner. **Multi threading**: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication

UNIT-IV

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. **AWT:** class hierarchy, component, container, panel, window, frame, canvas, graphics, Layout Manager – layout manager types – boarder, grid, flow, card and grib bag.

UNIT-V

AWT controls: Labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar. Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, create applets, passing parameters to applets. JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

1. Java- the complete reference, Seventh edition, Herbert schildt, Tata McGraw Hill.
2. Database Programming with JDBC&JAVA, Second Edition,GeorgeReese, O'ReillyMedia.

3. Understanding OOP with Java, updated edition, T. Budd, pearsoneducation

Reference Books:

1. Thinking in Java Fourth Edition, Bruce Eckel
2. Introduction to Java programming, Y. Daniel Liang, pearson education.

Course Outcomes:

- Understanding of OOP concepts and basics of Java programming (Console and GUI based).
- The skills to apply OOP and Java programming in problem solving.
- Should have the ability to extend his/her knowledge of Java programming further on his/her own

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(A54215)JAVA PROGRAMMING LAB

Course Objectives:

- To introduce java compiler and eclipse platform independent
- To import hand on experience with java programming.

Week 1:-

- 1) Write a program to find total, average of given two numbers by using function with default arguments, static data members and this keyword?
- 2) Write a program to illustrate class and objects (Banking operations)

Week 2:-

- 3) Write a program to illustrate constructors?(Inventory of Books)
- 4) Write a program to create a class complex with necessary operator overloading and type conversion such as integer to complex, complex to double.

Week 3:-

- 5) Write a program that randomly generates complex numbers and write two numbers per line in a file along with an operator(+,-,*,/). The numbers are written to file in the format (a+ib)
- 6) Write a program to read online at a time, perform the corresponding operation on two complex numbers read, write the result to another file (one per line)

Week 4:-

- 7) Write a program to illustrate inheritance (Student Evaluation)
- 8) Write a java program to handle the situation of exception handling

Week 5:-

- 9) Write a java program to demonstrate the concept of polymorphism.
- 10) Write a java program to illustrate Method Overriding?

Week 6:-

- 11) Write a java program to illustrate Method overloading of assignment operator?
- 12) Write a program to illustrate Array Manipulation?

Week 7:-

- 13) Write a program to illustrate Synchronization?
- 14) Write a program to String Tokenizer?

Week 8:-

- 15) Write a program to implement the concept of User defined Exceptions.
- 16) Write a program to illustrate the use of creation of packages

Week 9:-

- 17) Write a program to illustrate Multithreading and Multitasking?
- 18) Write a program to illustrate thread priorities.

Week 10:-

- 19) Write a program to illustrate applet concept.

Week 11:-

- 20) Write a program to illustrate Event Handling (keyboard, Mouse events)

Week 12:-

- 21) Write a program to develop a calculator application using AWT.

Week 13:-

22) Write a program to illustrate JDBC.

Course Outcomes:

- Basis of java programming, multi-threading programs and exception handling.
- The skills to apply OOP in java programming in problems solving.
- Ability to accept data from database which java programming.
- Use of GUI components.

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(A54216)DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

- This lab enable the students to practice the concepts learnt in the subject DBMS by developing the database for an example company named “Roadway travels” who describes is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database "Roadway travels". Students are expected to use MySql database

Library Application:

Introduction

Example: This project aims to computerize the operations of the library. Features include searching for books, reserving books, issue and return of books, handling late returns and fines, ordering of books/journals from publishers, etc.

Application Users

Example: The users of the system are the library staff, institute staff, and students. Students and institute staff can view what books they have borrowed, and what books they have requested, and search on the collection of books. All other functionality is restricted to library staff.

Functions Overview

Example: The following functionality will be supported by the library application.

1. Book issue and return
2. Fine calculation and collection
3. Adding and deleting books
4. Searching for books
5. Report generation
6. Automatic late book reminder

ER Diagrams

Show your ER diagrams here. Split your ER diagrams into pieces. Each entity is listed with its attributes in only one place. In other diagrams, the entity name is used, but its attributes are not specified again (this will lead to redundancy).

Functional Dependencies and Normalization

Give the initial relational schema which you derive from the ER diagram. List functional dependencies you would expect to hold, and steps in the process of normalization to BCNF (in case you need to decompose the relations, show the intermediate steps here). No need to show types of attributes here.

Data Dictionary

What goes here: The final SQL data dictionary which will be used in the project, including types of all attributes?

Users

Note: You can have one subsection per relation, or have multiple relations organized into

each subsection here.

Users relation:

ID	varchar(8)	Primary key	User ID (roll number)
Name	varchar(40)	Not null	Name of user
Email	varchar(30)	Not null	Email ID of user
user type	Varchar(8)	Foreign key references user_types	What type of user (e.g. student, faculty, staff)
join date	Date	Not null	Date of joining
end date	Date	Not null	Termination date (when student will pass out)

Exercise:1 E-R Model

Analyze the problem carefully and come up with the entities in it.

Identify what data has to store in the database.

Apply all Integrity Constraints where ever is applicable.

Example **Entities:**

- Users
- Library Staff
- Institute Staff
- Student
- Book etc...

Example **Relationships:**

- Borrow
- Search
- Request etc..

Experiment 2:

Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship identify the strong entities and weak entities (if any) .Indicate the type of relationship (total/partial).Try to incorporate generalization, aggregation, specialization wherever required

Experiment 3: Relational model

Represent all the entities (strong, weak) in tabular fashion. Represent relationships in tabular fashion. There are different ways of representing relationships as tables based on cardinality. Represent Attributes as columns in tables or as tables based on the requirement .Different types of attributes (Composite, Multi-Valued and derived) have different way of representation.

Example:

This is Student Table look as below, this is an example, you can add more attributes based on your E-R Model. This is not a normalized table

Student:

Name	<u>Hall ticket</u>	year	branch	address	Add-onCourses	blood group
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Note: The student is required to submit a document by representing relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database Normalization is a techniques part of schema refinement process to minimize the redundancy of information and in so doing, to safe guard the database against certain types of logical or structural problems.

For example for the above table add on courses is a Multi valued attribute we can remove the multi valued attribute Add-on courses and place it in another table along with primary key so that the two tables are in First Normal form .

Name	<u>Hall ticket</u>	year	Branch	Address	Blood Group
------	--------------------	------	--------	---------	-------------

<u>Hall Ticket</u>	Add-on Course
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Note: The student is required to submit a document by drawing the E-R diagram to the lab teacher.

Experiment 5: Installation and Exposure of IBM DB2 and Practicing DDL Commands

In this week you will learn creating databases, creating tables, altering tables, dropping tables, truncate and renaming commands

Experiment 6: Practicing DML Commands

DML Commands are used for managing data within schema objects.

- Select

- Insert
- Delete
- Update

Experiment 7: Querying

In this week you are going to practice the queries including sub-queries using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT etc.

- Practice the SQL Queries in retrieving the data from different tables.
- Practice the SQL Queries which include Group by/Aggregate Functions
- Practice Queries which includes Where Clause, Group by Clause, Having Clause, Order by Clause
- Practice Nested Queries
- Perform Different Set Operations & Join Operations on the tables
- Perform Different Set Operations & Join Operations on the tables.

Experiment 8:

Practice queries on Grouping /Aggregate functions:

Experiment 9:

Triggers

In this week you are going to work on Triggers. Creation of Insert Trigger, Delete Trigger, Update Trigger. Practice Triggers using the library database.

Experiment 10: Procedures

In this session you are going to learn of stored procedures, execution of stored procedure and modification of procedure. Practice procedures using the Library database.

Experiment 11: Cursors

In this week you need to work on declaring a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data in to local variables as needed from the cursor, one row at a time. Close the cursor when work is done.

Experiment 12: Exception Handling

In this week students have to work on exception handling and they will get exposure to programs in how to catch the exceptions.

Course Outcomes:

- Ability to design and implement a database schema for given problem.
- Be capable to design and build a GUI application
- Apply the normalization techniques for development of application software to realistic problems
- Ability to formulate queries using SQL DML/DDD/DCL commands

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(A54217)PERSONALITY DEVELOPMENT –II

1. Leadership

- What makes a Leader
- Qualities of a Good Leader
- Leader with a purpose
- Selfless Leader
- Activities
- Practical Sessions

2. Team Skills

- Team Building
- Individual Skills
- Team Skills
- Subordinate Skills
- Leading Skills
- Practical Session

3. Resume and Cover Letter, Writing about yourself

- Resume Writing
- Cover Letter
- Practical Session
- Practical Session
- Practical Session
- Practical Session

4. Group Discussion

- What is GD
- Types of GD
- Group Dynamics
- How to take feedback
- Practice Session

5. Interview Skills

- Why Interviews – Corporate Outlook
- Tips for a Good Interview
- Interview Questions – Personal
- Interview Questions – Professional
- Common Interview Blunders
- Practical Sessions

6. Stress Management and Emotional Intelligence

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0	2	0

(A54218)GENDER SENSITIZATION

Course Objectives:

- To develop students sensibility with regard to issues of gender in contemporary India.
- To provide critical perspective or the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender vigilance.
- To expose students to more egalitarian interactions between men and women.

UNIT-I

UNDERSTANDING GENDER:

Gender: Why should we Study it? (Towards a world of equals: Unit - 1)

Socialization: Making women, Making Men (Towards a world of equals: Unit – 2)

Introduction. Preparing for Womanhood Growing up male. First lessons in Cases. Different masculinities.

Just Relationships: Being Together as Equals (Towards a world of equals: Unit – 12)

Mary Kom and onles love and Acid just do not Mix. Love Letters, Mothers and Fathers. Furthure Reading: Rose Parks The Brave Heart.

UNIT-II

GENDER AND BIOLOGY:

Missing Women: Sex Selection and its consequences (Towards a world of equals: Unit – 4)

Destining Sex Ratio, Demographic Consequences.

Gender Spectrum: Beyond the Binary (Towards a world of Equals unit – 10)

Two or Many? Struggles with Discrimination

Additional reading: Our Bodies, Our Health (Towards a world of equals: Unit – 13)

UNIT-III

GENDER AND LABOUR:

Housework: the Invisible Labour (Towards a world of equals: Unit – 3)

“My Mother doesn’t Work.” “Share the Load.”

Women’s Work: Its Politics and Economics (Towards a world of equals: Unit – 7)

Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work

UNIT-IV

ISSUES OF VOLENCE:

Sexual Harassment: Say Not (Towards a world of equals: Unit – 6)

Sexual Harassment: not Eve teasing Coping with Everyday Harassment Further Reading: “Chupalu”.

Domestic Violence: Speaking Out (Towards a world of equals: Unit – 8)

Is home a safe place? – When women unite [Film]. Rebuilding lives Further Reading New Forums for Justice.

Thinking about Sexual Violence (Towards a world of equals: Unit – 11)

Blaming the Victim-“I fought for my life....” – Further Reading: The Caste Face of Violence

UNIT-V

GENDER STUDIES:

Knowledge: Through the Lens of Gender (Towards a world of equals: Unit – 5)

Point of view Gender and the structure of knowledge. Further Reading: Unacknowledged women Artists of Telangana.

Whose History? Questions for historians and others (Towards a world of equals: Unit – 9)

Reclaiming a Past. Writing other Histories. Further Reading: Missing Pages from Modern Telangana History.

Essential Reading: All The Units In the Textbook, “ Towards a World of Equals: A Bilingual Textbook on Gender” written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note: Since it is interdisciplinary course, Resource Persons can be drawn from the fields of English Literature or Sociology or political science or any other qualified faculty who has expertise in this field.

Reference Books:

1. Sen, Amartya. “More than One Million Women are Missing.” New York of books 37.20 (20 December 1990). Print. “we Were Making History...” Life Stories of Women in the Telangana People’s Struggle. New Delhi: Kai for Women. 1989.
2. Tripti Lahiri. “By the Numbers: Where Indian Women Work.” Women’s Studies Journal (14 November 2012) Available online at : <http://blogs.wsj.com/india-real-time/2012/11/14/by-the-numbers-where-indian-women-work/>
3. K.Satyanaraya and Susie Tharu (Ed.) Steel Nibs Are Scrubbing: New Dalit Writing From South India, Dussier 2. Telugu And Kannada <http://harpercolling.co.in/BookDetail.aso?BookCodes3732>
4. Vimala. “Vartillu (the Kitchen)”. Women Writing in India: 600 BC to the Present. Volume II: The 20th Century. Ed. Susie Tharu and K.Lalits. Delhi:Oxford University Press, 1995. 599-601.
5. Shatruguna. Veena At . Women’s Work and its Impact on Child Health and Nutrition Hyderabad, National Institute of Nutrition . India council of research. 1993.
6. Stree Shakti Sangeetana. “We Were Making History ... ‘Life Stories of women in the Telangana People’s Struggle. New Delhi: Kai for Women. 1989.
7. Menon. Nivedita. Seeing Like a Feminist New Delhi: Zubaan-Penguin Books, 2012.
8. Yayaprabha, A. “Chupulu (states)”. Women Writing in India: 500BC to the Present. Volume II: The 20th Century Ed. Susie Tharu and K.Lalita Delhi: Oxford University Press. 1995.596-597.
9. Haveed Shayam and Anupam Maruhaar, “Women and Wage Discrimination in India: A Critical Analysis. ” I International journal of Humanities and Social Science Invention 2.4(2013)
10. Gautam. Liela and Gita Ramaswamy. “A Conversation between a Daughter and a Mother. “ Eroadsheet on contemporary Politics. Special Issue on Sexually and Harassment: Gender Politics on Campus Today. Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad Anveshi Research Center for Women’s Studies. 2014.
11. Aodulali Sohaila. “I fought for My Life .. and Won. “ Available online at <http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohala-abdula/>
12. Jeganathan Pradeep. Partha Chattarjee (Ed). “Community, Gender and Violence Subaltern Studies XI”. Parmanert Black and Ravi Dayal Publishers, New Delhi, 2000.
13. Kkapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India London: Zed Books. 2002

14. S. benhabib. Situating the Self Gender, Community ana Postmoderism in Contemporary Ethics. London roullege. 1992

15. Virginia Woolf. A Room of One's Own. Oxford Black Swan. 1992

16. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a human Face, Karachi Oxford University Press, 1997

Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professions a will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the now laws that provide protection and relief to women, the textbook will empower students to understand respond to gender violence.

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II Year B.Tech. CSE - I Sem

L	T / P / D	C
4	1	4

(A55023)DESIGN AND ANALYSIS OF ALGORITHMS

Course Objectives:

- Analyze the asymptotic performance of algorithms.
- Paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.
- Synthesize efficient algorithms in common engineering design situations.
- To utilize data structures and algorithmic design techniques in solving new problems

UNIT-I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis- Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Disjoint Sets- disjoint set operations, union and find operations. **Divide and conquer:** General method, applications- Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT-II

Graphs: breadth first search, depth first search, spanning trees, connected and bi- connected components **Greedy method:** General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT-IV

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. **Branch and Bound:** General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT-V

Lower Bound Theory: Comparison Trees, NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP - Hard and NP Complete classes, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:

1. Ellis Horowitz, SatrajSahni and Rajasekharam, Fundamentals of Computer Algorithms, Galgotia publications pvt. Ltd, Second Edition, 2007.
2. Aho, Ullman and Hopcroft, Design and Analysis of algorithms, Pearson education, Reprint 2002

Reference Boks:

1. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Introduction to Design and Analysis of Algorithms A strategic approach, McGrawHill, 2005.
2. Allen Weiss, Data structures and Algorithm Analysis in C++, Third edition, Pearson education

Course Outcomes:

- Acquire the knowledge of algorithm analysis and its notations that are applied on the problems solved by divide and conquer paradigm.

- Apply the major graph algorithms for model engineering problems and knowledge of the greedy paradigm
- Apply the dynamic-programming paradigm and recite algorithms that employ this paradigm.
- Apply the concept of back tracking, branch and bound paradigm for real time problems.
- Analyze the complexity of problems and differentiate that in terms of P and NP problems with examples

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III Year B.Tech. CSE - I Sem

L	T / P / D	C
3	1	3

(A55024)COMPILER DESIGN

Course Objectives:

- To introduce the concepts of text processing.
- To introduce major parsing methods.
- To introduce the principal ideas in syntax directed definitions and translations and intermediate code generation for typical programming languages.
- To introduce the technology of code optimization To introduce different code generation algorithms

UNIT-I

Introduction to Compilers: Structure of Compiler-Phases of Compiler, Symbol Table Management, Grouping of Phases into Passes, Compiler Vs Interpreter. **Lexical Analysis:** Role and need of Lexical Analyzer, Input Buffering, Regular expressions for identifiers, Signed numbers etc., A Language for specifying Lexical Analyzer, Lexical phase errors

UNIT-II

Syntactic Specification: Context Free Grammars, Derivations and Parse Trees, Capabilities of Context Free Grammars, Syntactic Phase errors, Semantic errors. **Basic Parsing Techniques:** Parsers, Shift-Reduce Parsing, Operator-Precedence parsing, Top-Down parsing, Predictive parsers.

UNIT-III

Construction of efficient Parsers: LR Parsers, Canonical collection of LR(0) items, Constructing SLR parsing tables, Constructing LR parsing tables, Constructing LALR parsing tables, using Ambiguous grammar, Comparison of SLR, LALR and CALR parsers, Comparison of Top down and Bottom up parsers.

UNIT-IV Syntax Directed Translation: Syntax Directed Translation schemes, Intermediate codes, Postfix notation, Three Address code, Quadruples and triples. **Symbol table:** Contents of Symbol table, Data Structures for symbol tables, representing scope information.

UNIT-V

Code Optimization: Principal sources of optimization, Loop optimization, Copy Propagation, Dead code elimination, Redundant sub expression elimination. **Code Generation:** Object programs, problems in Code generation, A Machine Model, A Simple Code generator, Register allocation and assignment, Peephole optimization.

Text Book:

1. Alfred V Aho, Jeffrey D Ullman, Principles of Compiler Design

Reference Books:

1. J P Tremblay and P G Sorenson, The Theory and practice of Compiler Writing
2. Dick Grone, Henri E Bal, Cerial J H Jacobs , Wiley ,Modern Compiler Design dreamtech.

Course Outcomes:

- Analyze different phases of compiler and different translators.
- Design top down parsers and bottom up parsers for the language constructs.
- Understand the role of symbol table and design various data structures for symbol table.
- Apply syntactic analysis and generate intermediate code for different programs
- Apply different optimization techniques and code generation

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III Year B.Tech. CSE - I Sem

L	T / P / D	C
3	0	3

(A55025)WEB TECHNOLOGIES

Course Objectives:

- Developing static web pages using HTML and CSS.
- Data Validations using JavaScript.
- To build XML applications with DTD and style sheets that spans multiple domains.
- Developing Dynamic pages.
- Manipulating data in the database using JDBC

UNIT-I

Introduction To Web: Understanding Internet and Web, Web Architecture, Web servers, protocols: HTTP, Introduction HTML: History of HTML, WWW, HTML Basics: Elements, Attributes, Tags, Tables, Forms, Frames, div and span tags.

UNIT-II CSS:

Introduction to cascading style sheet, Types of style sheets, page layout, selectors, pseudo classes and elements.

Javascript: Introduction to scripting, control structures, conditional statements, Arrays functions, objects.

HTML DOM: Predefined object (Window, Location, History, and Navigator). Events, DOM Node methods, Navigation, creating nodes, adding nodes, inserting nodes, removing & Replaces Nodes, Form object and Elements, DHTML with Java Script.

UNIT-III

XML: Basics of XML, Elements, Attributes, validation, Name space, XML Scheme Languages: Introduction to DTD, internal and external DTD, Elements of DTD, DTD Limitations, XML Schema, Schema structure, Elements, parsing XML: XML DOM, Document node, element node, Text node, Java and DOM, Navigating DOM Tree

UNIT-IV

AJAX: Introduction, Environment, Asynchronous communication, process steps, sending and Retrieving Information, Ajax with XML.

Servlets : Introduction, Lifecycle, Generic and HTTP servlet, passing parameters to servlet, HTTP servlet Request & Response interfaces, Deploying web Applications, Session Tracking: Hidden form fields, cookies, URL- Rewriting, session.

UNIT-V

JSP: Introduction, Difference Between servlets & JSP, Anatomy of JSP page, JSP elements: Directives, comments, Expressions, scriptlets, Declaration, Implicit JSP objects, using Action elements.

JDBC: Introduction, JDBC Drivers, Loading Driver, establishing connection, Executing SQL statement in JSP pages, MVC architecture

Text Books:

1. Uttam K. Roy, Web Technologies, 8th Impression, Oxford Publication, 2014.

Reference Books:

1. Sebesta, Programming World Wide Web, 4th edition, Pearson, 2008.
2. Chris Bates, Web Programming, building internet applications, 2nd edition, WILEY

Dreamtech, 2012.

3. Dietel and Nieto, Internet and World Wide Web – How to program, 3rd edition, PHI/Pearson Education Asia, 2012.
4. Marty Hall and Larry Brown, Core Servlets and Java Server Pages Volume 1: Core Technologies, 2nd edition, Pearson 2012.

Course Outcomes:

- Design static web pages and provide client side authentication.
- Prepare Static Web pages With Validations.
- Develop new tag sets using XML mechanism.
- Design and develop web applications using JSP and MVC architecture
- Understand database connectivity and retrieving data using client/server database

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III Year B.Tech. CSE - I Sem

L	T / P / D	C
3	1	3

(A55026)COMPUTER NETWORKS

Course Objectives:

- Compare OSI & TCP/IP models
- Understand error detection, correction codes and framing methods
- Explain MAC and types of Ethernet
- Discuss the concepts of LANs and Virtual Networks
- Outline the concepts of logical addressing

UNIT-I Network Models-Layered Tasks, OSI model, Layers in the OSI model, TCP/IP protocol Suite, Addressing

UNIT-II Data Link Layer: Error Detection and Correction-Introduction, Block coding, Cyclic Codes, Check sum. **Data Link Control** –Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC

UNIT-III Medium Access Control: Multiple Access - Random Access, Controlled Access, Channelization. **Wired LANs**- IEEE Standards, Standard Ethernet, Changes in standard, Fast Ethernet, Gigabit Ethernet.

UNIT-IV Connecting LANs, Backbone Networks and Virtual LANs: Connecting Devices, Backbone Networks, Virtual LANs.

UNIT-V Network Layer: Logical Addressing – IPV4 addresses, IPV6 addresses.**Internet Protocol** - Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6.

Text Book:

1. Behrouz A Forouzan, "Data Communications and Networking", 4th Edition, McGraw-Hill.

Reference Books:

1. Andrew S. Tanenbaum, Computer Networks, Third Edition.
2. William Stallings, Data Communications, Eight Editions. Pearson Publishers.

Course Outcomes:

- Analyze TCP/IP and OSI models and various protocols
- Identify suitable multiple access protocol for different networks
- Analyze various error handling mechanisms
- Use of various devices in connecting different types of LANs
- Compare and contrast ipv4 and ipv6

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III Year B.Tech. CSE - I Sem

L	T / P / D	C
4	0	4

(A55027)OPERATING SYSTEMS

Course Objectives

- Understand operating system concepts
- Analyze process scheduling and synchronization concepts.
- Identify deadlock mechanisms
- Understand memory management approaches.
- Identify storage management and protection.

UNIT-I

Operating Systems Overview and Process Management: Introduction-What operating system do, Operating system structure (uni-programmed and multi programmed), Operating system operations, Operating system services, System calls, Types of System calls, Operating system structure. Process Management- Process concepts, Process scheduling, Operations on processes, Inter process communication.

UNIT-II

Process Scheduling and Synchronization: Multithreaded programming: Overview, Multithreading models. **Process Scheduling** – Basic concepts, Scheduling criteria, Scheduling algorithms, Thread scheduling. **Process coordination:** Synchronization – Background, The critical section problem, Peterson's solution, Synchronization hardware, Semaphore, Classical problems of synchronization, Monitors.

UNIT-III

Deadlocks: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Detection and avoidance, Recovery from deadlock.

UNIT-IV

Memory Management: Swapping, Contiguous memory allocation, Paging, Segmentation. Virtual memory management - Demand paging, copy-on-write, page- replacement, Thrashing.

UNIT-V

File system, system protection and security: Storage management – File concept, Access methods, Directory and disk structure, File-system mounting. System protection- Goals of protection, principles of protection, Domain of protection, Access matrix. System Security – Security problem, Program threats, System and Network threats.

Text book:

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, 9th edition ,John Wiley, 2016

Reference books:

1. D.M. Dharmdhere, Operating Systems – A Concept based Approach, 2nd Edition.
2. Andrew S Tanenbaum, Modern Operating Systems, 3rd Edition, PHI, 2008
3. Behrouz A. Forouzan, Richard F. Gilberg, UNIX and shell programming, cengage Learning 2009.

Course Outcomes:

- Summarize operating system and process management concepts
- Apply process scheduling and synchronization related issues.

- Understand Deadlock prevention, avoidance, detection, recovery mechanisms.
- Analyze effectively memory management concepts
- Illustrate various protection and security measures.

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III Year B.Tech. CSE - I Sem

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0	3	2

(A55209)ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Introduction:

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use good English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

Course Objectives:

- This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:
- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

1. **Vocabulary Building** – synonyms and antonyms, Word Roots, One-Word Substitutes, Prefixes and Suffixes, Study of Word Origin, Analogy, Idioms and Phrases.
2. **Reading Comprehension** – Reading for Facts, Guessing meanings from context, Scanning, Skimming, Inferring Meaning, and Critical Reading.
3. **Writing Skills** – Structure and presentation of different types of writing - Resume Writing /E- Correspondence/Statement of Purpose.
Technical Writing-Technical Report Writing, Research Abilities/Data Collection/Organizing Data/Tools/Analysis.
4. **Group Discussion** – Dynamics of Group Discussion, Intervention, Summarizing, Modulation of Voice, Body Language, Relevance, Fluency and Coherence.
5. **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/Seminars, Written Presentations through Projects/ PPTs/e-mails etc.
6. **Interview Skills** – Concept and Process, Pre-Interview Planning, Opening Strategies,

Answering Strategies, Interview through Telephone and Video-Conferencing

Minimum Requirement:

The English Language Lab shall have two parts:

- i) The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) Headphones of High quality

Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- Clarity Pronunciation Power – part II □
- Oxford Advanced Learner's Compass, 7th Edition □
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA cracking GRE by CLIFFS
- The following software from _train2success.com
 - i. Preparing for being Interviewed,
 - ii. Positive Thinking,
 - iii. Interviewing Skills,
 - iv. Telephone Skills,
 - v. Time Management
 - vi. Team Building,
 - vii. Decision making
- English in mind , Herbert puchta and Jeff Stranks with Meredith Levy , Cambridge

Text Books:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011
3. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna
4. Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
5. English Vocabulary in Use series, Cambridge University Press 2008.
6. Management Shapers Series by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.
7. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.

8. Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
9. Job Hunting by Colm Downes, Cambridge University Press 2008.
10. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
11. English for Technical Communication for Engineering Students, Aysha Vishwa mohan, Tata Mc Graw-Hil 2009.
12. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/Cambridge University Press.
13. International English for Call Centres by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.

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III Year B.Tech. CSE - I Sem

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0	3	2

(A55210)WEB TECHNOLOGIES LAB

Course Objectives:

- Developing static web pages using HTML and CSS.
- Data Validations using JavaScript.
- To build XML applications with DTD and style sheets that span multiple domains.
- Manipulating data in the database using JDBC
- Developing Dynamic pages using servlets, JSP

Week-1:

Design the following static web pages required for an online book store web site.

- 1) HOME PAGE:
- 2) LOGIN PAGE:

Week -2:

Design the student REGISTRATION PAGE:

Week - 3:

Apply internal and external CSS (Cascading Style Sheets) for week1&2 pages.

Week -4:

VALIDATION: Write JavaScript to validate the following fields of the above registration page.

Week -5:

Design the catalogue page

Week -6:

Write an XML file which will display the Book information which includes the following: Write a Document Type Definition (DTD) to validate the above XML file.

Week -7:

Install TOMCAT web server and APACHE. While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port. Deploy above all pages in to tomcat web server.

Week -8:

Write a program to display the HELLO WORLD message using servlet.

Week - 9:

Communicate two servlets using doGET and doPOST methods.

Week -10:

Write a program to create cookies and retrieval using servlet.

Week -11:

Write a program to display the HELLO WORLD message using JSP

Week -12:

Convert all above static web pages into the JSP pages.

Week -13:

Using registration form. Authenticate the user when he submits the login form using the user name and password from the database

Week -14

Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount)) of each category. Modify your catalogue page (week 4)in such a way that you should connect to the database and extract data from the tables and

display them in the catalogue page using JDBC.

Week -15

Implement week -10 in MVC architecture.

Course Outcomes:

- Design static web pages and provide client side authentication.
- Develop new tag sets using XML mechanism.
- Understand database connectivity and retrieving data using client/server database.
Design dynamic web pages and develop web applications using MVC architecture

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III Year B.Tech. CSE - I Sem

L	T/P/D	C
0	3	2

(A55211)OPERATING SYSTEMS AND COMPUTER NETWORKS LAB PART A

Course Objectives:

- Analyze system calls that can offer operating system services
- Demonstrate various operating system concepts
- Understand and apply concepts towards new operating system design
- Understand the concept of Dead lock and its avoidance
- Developing page replacement algorithms

List of Experiments:

1. Write a programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write a program to implement multithreading?
3. Give the list of processes, their CPU burst times and arrival times, display or print the Gantt chart for FCFS and SJF. For each of the scheduling policy compute and print the average waiting time and average turnaround time
4. Give the list of processes, their CPU burst times and arrival times, display or print the Gantt chart for Priority and Round Robin. For each of the scheduling policy compute and print the average waiting time and average turnaround time.
5. Implement producer consumer problem using semaphore?
6. Write a program to implement Banker's algorithm for deadlock avoidance?
7. Write a program to implement page replacement algorithms (FCFS, Optimal, LRU)

Course Outcomes:

- Understand system calls behavior and implement that can offer operating system services
- Implement operating system concepts
- Implement the producer and consumer problem
- Implement the dead lock avoidance using banker's algorithm
- Develop the CPU scheduling applications .

PART B

Course Objectives:

- Understand data link layer framing methods.
- Explain the various errors handling mechanism.
- Understand data link control protocols
- Implement various protocols of Noisy and Noiseless Channels

List of Experiments:

1. Implement the data link layer framing methods: Bit stuffing, Character Stuffing.

2. Implement CRC 16 error control mechanism in data linklayer
3. Implement minimum hamming Distance
4. Implement Stop and Wait protocol.
5. Implement Go-Back-N and Selective Repeat Request protocols.
6. Implement CSMA/CD Using C program.
7. Write a C program for CSMA/CA.

Course Outcomes:

- Implement different data link layer framing methods.
- Analyze error control methods.
- Implement different protocols of noiseless Channels.
- Develop programs for protocols in noisy Channels

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III Year B.Tech. CSE - I Sem

L	T / P / D	C
0	3	2

(A55212) LOGICAL REASONING AND QUANTITATIVE APTITUDE – I

UNIT-I

Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.

Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous Pair, Double Analogy, Word Analogy and Number Analogy.

UNIT-II

Classification / Odd One Out: Word Classification, Number Classification, Letter Classification.

Coding – Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled coding.

UNIT-III

Blood Relations: Deciphering Jumbled up Descriptions, Relation Puzzle – Direction sense test. Number, Ranking & Time Sequence Test – Arithmetical Reasoning – Mathematical Operations.

UNIT-IV

Number System: Test for Divisibility, Test of prime number, Division and Remainder – HCF and LCM of Numbers – Fractions

UNIT-V

Ratio and Proportion: Properties of Ratio, Comparison of Ratios, Useful Simple Results on Proportion – Partnership and Share – Mixtures.

Text Books:

1. Verbal and Non Verbal Reasoning by R.S. Agarwal.
2. Quantitative Aptitude by R.S. Agarwal.
3. Quantitative Aptitude by Abhijit Guha.

Course Outcomes:

Student will be able to:

- Enhance the problem-solving ability of the students with focusing on basic concepts of arithmetic, algebra, geometry data analysis.
- Demonstrate various principles involved in solving mathematical problems and thereby Reducing the time taken for performing job functions.

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III Year B.Tech. CSE - II Sem

L	T / P / D	C
3	1	3

(A56031)ADVANCED COMPUTER NETWORKS

Course Objectives:

- Understand different Address Mapping Methods
- Compare different routing protocols
- Understand transport layer protocols
- Discuss the concepts congestion control
- Outline Application layer

UNIT-I

Brief Introduction on Network Models, error detection and correction in data link layer.

Network Layer: Address Mapping, Error Reporting and Multicasting-Address Mapping, Internet Control Message Protocol (ICMP), Internet Group Management Protocol (IGMP), Internet Group Management Protocol Version6 (ICMPv6).

UNIT-II

Network Layer: Delivery, Forwarding and Routing- Delivery, Forwarding, Uni-casting Routing Protocols, Multicast Routing Protocols

UNIT-III

Transport Layer: Process to Process Delivery, User Datagram Protocols (UDP), and Transmission control Protocol (TCP), Stream Control Transmission Protocol (SCTP).

UNIT-IV

Transport Layer: Congestion Control and Quality of Service-Data Traffic, Congestion, Control, Quality of Service, Techniques to improve QoS, Integrated Services, and Differentiated services.

UNIT-V

Application Layer: Domain Name System- Namespace, Domain Name Space, Distribution of Name Space, DNS in Internet, Resolution, Domain Name Space (DNS) Messages, Electronic Mail, File Transfer.

Text Book:

1. Behrouz A Forouzan, Data Communications and Networking, 5th Edition, McGraw- Hill, 2013.

Reference Books:

1. Andrew S. Tanenbaum, Computer Network, 5th Edition, Pearson Education India, 2014.
2. William Stallings, Data Communications, 8th Edition, Pearson Education, 2013.

Course Outcomes:

- Analyze TCP/IP and OSI models and various protocols.
- Analyze various network layer protocols.
- Compare and contrast various Routing and Congestion control algorithms.
- Choose suitable protocol (UDP/TCP) of transport layer based on the type of the application.
- Evaluate various responsibilities of application layer.

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III Year B.Tech. CSE - II Sem

L	T / P / D	C
3	1	3

(A56032)DATA WAREHOUSING AND DATA MINING

Course Objectives:

- To familiarize the concepts and architectural types of data Warehouses.
- Provides efficient design and management of data storages using data warehousing and OLAP.
- To understand the fundamental processes concepts and techniques of data mining.
- To consistently apply knowledge concerning current data mining research and how this may contribute to the effective design and implementation of data mining applications.
- To provide advance research skills through the investigation of data-mining Literature

UNIT-I

Data Warehouse and OLAP Technology: what is a Data Warehouse, Multidimensional Data Model, OLAP Operations on Multidimensional Data, Data Warehouse Architecture **Cube computation:** Multiway Array Aggregation, BUC

UNIT-II

Introduction to Data Mining: Fundamentals of data mining, Data Mining Functionalities, Data Mining Task Primitives, Major issues in Data Mining. **Data Preprocessing:** Needs for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction

UNIT-III

Mining Frequent Pattern: Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, **Classification and Prediction:** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification

UNIT-IV

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods-K-means, PAM, Hierarchical Methods- BIRCH, Density- Based Methods-DBSCAN, Outlier Detection

UNIT-V Pattern Discovery in real world data: Mining Time-Series Data, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web, Data Mining Applications

Text Book:

1. Jiawei Han and MichelineKamber, Data Mining Concepts and Techniques, Second Edition, Elsevier, 2007.

Reference Books:

1. Alex Berson and Stephen J. Smith, Data Warehousing, Data Mining & OLAP, Tata McGraw Hill, Tenth Reprint, 2007.
2. ArunK.Pujari , Data Mining Techniques, 2nd Edition, Universitiespress.

Course Outcomes:

- Design a data mart or data warehouse for any organization
- Apply Association and classification knowledge to different datasets
- Apply the clustering Techniques for different datasets
- Explore recent trends in data mining such as web mining, spatial-temporal mining

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(A56033)CLOUD COMPUTING

Course Objectives:

- To understand the concepts of virtualization and its benefits
- To impart fundamental concepts in the area of cloud computing.
- To impart knowledge in applications of cloud computing.

UNIT-I

Introduction to Virtualization: Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as a service – SaaS, grid computing, utility computing, virtualization processes.

Virtualization Technologies-I: Ubuntu (server edition), Altiris, Windows server, Software virtualization, VMware, Intel virtualization, Red Hat virtualization, Soft grid application, Linux virtualization, Desktop virtualization, Hardware virtualization, Resource virtualization, Processor virtualization, Application virtualization.

UNIT-II

Virtualization Technologies-II: Storage virtualization, Virtualization density, Para-virtualization, OS virtualization, Virtualization software, Data Storage virtualization, Intel virtualization technology, Thinstall virtualization suite, Net framework virtualization, Windows virtualization on Fedora, Storage virtualization technologies, Virtualization level, Security monitoring and virtualization, Oracle virtualization.

UNIT-III

Virtualization and Storage Management: The heart of cloud computing- virtualization, defining virtualization, why virtualize, what can be virtualized, where does virtualization happen, how does virtualization happen, on the road to storage virtualization, improving availability using virtualization, improving performance through virtualization, improving capacity through virtualization, business value for virtualization

UNIT-IV

Introduction to Cloud Computing: Cloud Introduction and overview- Components, Infrastructure and Services, Why Use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology- Hardware & Software Infrastructure **Cloud Computing Architecture:** Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, and Distributed Computing

UNIT-V

Security: Security issues in Cloud Computing - Data Security, Network Security, and Host Security **Disaster Recovery:** Disaster Recovery Planning, Disasters in the Cloud, Disaster Management. **Scaling a Cloud Infrastructure-** Capacity Planning, Cloud Scale. **Case Studies:** Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE

Text Books:

1. Ivanka Menken, Gerard Blokdijk ,Cloud Computing Virtualization Specialist Complete

Certification Kit - Study Guide Book, 2009.

2. George Reese, Cloud Application Architectures Building Applications and Infrastructure in the Cloud, O'Reilly Media Press, 2009.

Reference Books:

1. Anthony T. Velte, Tobe J. Velte, Robert Elsenpeter, Cloud Computing: A Practical Approach, Publication Person Education, 2009
2. Tom Clark, Storage Virtualization: Technologies for Simplifying Data Storage and Management, Addison-Wesley, 2005
3. Curtis Brian J.S. Chee, Cloud Computing Technologies and Strategies of the Ubiquitous Datacenter, 2010

Course Outcomes:

- Compare and contrast different cloud architecture
- Learn & Implement Virtualization
- Analyze and design storage mechanisms
- Apply security mechanism for the Cloud.
- Understand Disaster recovery in Cloud

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(A56034)HUMAN COMPUTER INTERACTION (ELECTIVE – I)

Course Objectives:

- Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
- Recognize how a computer system may be modified to include human diversity.
- Select an effective style for a specific application.
- Design mock ups and carry out user and expert evaluation of interfaces

UNIT-I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design. **The graphical user interface** – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT-II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions

UNIT-III

Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT-IV

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.**Components** – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT-V

Software tools – Specification methods, interface – Building Tools. **Interaction Devices** – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers

Text Books:

1. Wilbert O Galitz, The essential guide to user interface design, Wiley DreamaTech, 2007.
2. Ben Shneidermann, Designing the user interface. 3rd Edition, Pearson Education Asia, 2001.

Reference Books:

1. Alan Dix, Janet Fincay, GreGoryd, Abowd, Russell Bealg, Human – Computer Interaction. Pearson.
2. Rogers, Sharps ,Interaction Design Prece,. Wiley DreamTech,

Course Outcomes

- Identify and formulate characteristics and components of graphical user interface.
- Analyze various design paradigms for human computer interaction.
- Design & implement human computer interaction using various design techniques.
- Support Design rules to use HCI in the software process.

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(A56035)UNIX PROGRAMMING (ELECTIVE – I)

Course Objectives:

- To understand the Unix utilities and be able to work with Bourne again shell (bash).
- To understand the file concepts, process, role of kernel in process management, signal generation and handling.
- Introduction to inter process communication, semaphores and multithreading.

UNIT-I

Introduction to Unix:- Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

UNIT-II

Unix Utilities:- Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities , detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

UNIT-III

Working with the Bourne shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, test command, control structures, arithmetic in shell, functions.

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files

UNIT-IV

Inter-process Communications: Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory.

Message Queues: Kernel support for messages, Unix system V APIs for messages, client/server example.

Semaphores: Kernel support for semaphores, Unix system V APIs for semaphores.

Shared Memory: Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.

UNIT-V

Files: File Concept, Files System Structure, Inodes, File Attributes, File Types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors.

Process: Process concept, Kernel support for process, process attributes, process control-process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.**Signals:** Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, pause, abort, sleep

functions

Text Books:

1. Sumitabha Das, Unix Concepts and Applications, 4th edition, TMH, 2006.
2. T.Chan, Unix System Programming using C++, PHI, 2012.

Reference Books:

1. N.Mathew, R.Stones,Wrox, Beginning Linux Programming, 4th edition, Wiley India Edition.
2. W.R.Stevens, Unix Network Programming, PHI, 2001.
3. Graham Glass, King Ables, Unix for programmers and users, 3rd Edition, Pearson Education, 2003.
5. B.A.Forouzan and R.F.Gilberg, Unix and Shell programming, Cengage Learning, 2009.
6. W.R.Stevens, Advanced Programming in the Unix environment, 2nd Edition, Pearson Education, 2001.

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(A56036)COMPUTER GRAPHICS (ELECTIVE – I)

Course Objectives:

- To exemplify the major computer graphics application areas.
- To create computer models of 2D And 3D objects using mathematical knowledge and skills.
- Understating the 2D and 3D transforms

UNIT-I

Introduction: Computer-Aided design, Presentation graphics, Computer Art, Entertainment, Education and Training, Visualization, Image processing, Graphics user interfaces.

Graphics Systems: Video display devices, Raster scan systems, Random scan systems, Input devices, Hard-copy devices, Graphics software

UNIT-II

Basic Graphic algorithms: Overview, Scan converting lines, Scan converting Circles, Scan converting Ellipse, Filling polygons, Clipping lines (Cohen Sutherland & Liang Barsky), Clipping polygons (Sutherland Hodgeman).

UNIT-III

Geometrical Transformations: 2D Transformation (Translation, Rotation, Scaling, Shearing & reflection), Homogeneous co-ordinates and matrix representation of 2D transformations, Composition of 2D transformations, the window-to-view port transformation.

3D Transformations: Matrix representation of 3D Transformations (Translation, Rotation, Scaling, Shearing & reflection.).

UNIT-IV

Viewing in 3D: Projections, Specifying an arbitrary 3D view, Examples of 3D viewing **Curves and surfaces:** Polygon meshes, Hermite curves, Bezier curves, Bezier surfaces, B-Spline surfaces.

UNIT-V

Visible surface determination: classification of visible surface determination algorithms (Back -Face Detection, Depth-Buffer, Scan line), BSP- Tree Method and Octree Method.

Illumination and Shading: Illumination models (Ambient Light, Diffuse & Specular Reflection and Phong Model), Shading models for Polygons (Gouraud & Phong).

Text Book:

1. Donald Hearn and M. Pauline Baker ,Computer Graphics C version, , 2nd Edition, 2011, Pearson.

Reference Books:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles and Practice in C, 2nd Edition, 2013, Pearson.
2. D.F. Rogers ,Procedural Elements for Computer Graphics, 2nd Edition, TMH

Course Outcomes:

- To discriminate the various structures of Computer Graphics system.
- To analyze basic principles of implementing Computer Graphics primitives.

- To compare and contrast between implementation of 2D and 3D transformations.
- To differentiate the techniques for representing 3D geometrical objects.
- To analyze requirements and constraints for hidden surface removal and rendering methods.

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(A56037)OBJECT ORIENTED ANALYSIS AND DESIGN

Course Objectives:

- Object oriented Analysis and Design using UML present the concepts and techniques necessary to effectively use system requirements to drive the development of a robust design model.
- To acquire UML, a common language for talking about requirements, designs, and component interfaces. Model a real-world application by using a UML class diagram.
- Showing how we apply the process of object oriented analysis and design to software development.
- Pointing out the importance and function of each UML model to the process of object oriented analysis and design, and explaining the notation of various elements in these models.

UNIT-I

Introduction to UML: Importance of modeling, principles of modeling, object oriented Modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

UNIT-II

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams. Design class diagram for Library information system.

UNIT-III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams. Design Use cases, Use case diagrams, Interaction diagram and Activity diagram for library system

UNIT-IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams. Design State machine for different objects in library system

UNIT-V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams. Design and document of library system.

Text Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, The Unified Modeling Language User Guide, 7th Impression, Pearson Education, 2008.

Reference Books:

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, UML2 Toolkit, 2nd Edition, WILEY-DreamTech India Pvt. Ltd., 2012.
2. Meilir Page-Jones, Fundamentals of Object Oriented Design in UML, Illustrated Edition, Pearson Education, 2000.

3. Pascal Roques, Modeling Software Systems Using UML2, 1st edition, WILEY- DreamTech India Pvt. Ltd., 2011.
4. Atul Kahate, Object Oriented Analysis & Design, 1st Edition, The McGraw-Hill Companies, 2007.
5. Mark Priestley, Practical Object-Oriented Design with UML, 2nd Edition, TATA McGrawHill,2005.

Course Outcomes:

- Recognize the concepts and principles of object oriented programming concepts.
- Understand the purposes, major components and key mechanisms of Class and Object Diagram.
- Describe the basic resource management responsibilities of Interaction Diagram.
- Knowledge on State-chart Diagram.
- Applying the techniques for Component and Deployment Diagrams.

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(A56038)SOFTWARE PROJECT MANAGEMENT

Course Objectives:

- A basic knowledge of software project management principles
- The ability to come up with a project schedule and assign resources
- Choose an appropriate project development methodology (e.g. waterfall, spiral ...)
- Identify project risks, monitor and track project deadlines

UNIT-I

Introduction to software project management: Introduction, importance of software project management, Categorization of software project, problems, setting of objectives, stakeholders, the business case, management control.

Stepwise: overview of project planning: Introduction, selection of projects, objectives infrastructure, products and activities, activity risks. Analysis of project characteristics, estimation of effort for each activity, allocation of resources, review/publicize plan/execute plan.

UNIT-II

Programme management and project evaluation: programme management, management of allocation of resources within a programme, strategic programme management, creating a programme management, aids to programme management, benefits, evaluation of individual project's, technical assessment, cost benefit analysis, evaluation techniques, cash flow forecasting.

Selection of an appropriate project approach: choosing technologies, technical plan content list, and dynamic system development method

UNIT-III

Software effort estimation: applications and its problems, the basis of software estimation.

Activity Planning: objectives, plan, project schedules, projects and activities (sequencing and scheduling), network planning models, formulating the network models, far ward and backward pass, identifying the critical path, activities.

UNIT-IV

Risk Management: framework (identification, assessment, planning, and management), evaluating risks to the schedule, applying the PERT techniques, Monte carol simulation, and critical chain concepts.

Resource Allocation: Nature, identifying requirements, scheduling, creating critical paths, counting costs, publishing, cost schedule, scheduling sequence.

UNIT-V

Monitoring and control: Creating framework, collecting data, visualizing progress, cost monitoring, earned value analysis, prioritizing monitoring, and change control.

Managing contracts: ISO 12207 approach, supply process, types, stages, typical terms of a contract, contract management, acceptance.

Managing people and organizing teams: organizational behavior, selecting the right person, instruction and best methods, motivation, Oldham-Hackman job characteristics working in groups, becoming a team, decision making, leadership, organizational structures, dispersed

and virtual teams, influence of culture, stress, health and safety

Text Books:

1. Bob Hughes and Mike Cotterell, Software Project Management, Tata McGraw- Hill, 4TH Edition.
2. Newtown Square A Guide To The Project Management Body Of Knowledge (PMBOK Guide)., Pa. : Project Management Institute, Inc., 2004. Print.

Reference Books:

1. Walker Royce, Software Project Management: Pearson Education, 2005.
2. Joel Henry: Software Project Management, Pearson Education.
3. PankajJalote: Software Project Management in practice, Pearson Education.

Course Outcomes:

- Apply the practice of project management in delivering of projects.
- Evaluate the project against strategic, technical and economic criteria.
- Identify effort estimation and activity plan of a project.
- Categorize and prioritize actions for risk management.
- Evaluate the characteristics of various team structures.

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(A56210)OBJECT ORIENTED ANALYSIS AND DESIGN LAB

Course Objectives:

- Identify Use Cases and develop the Use Case model.
- Identify the conceptual classes and develop a domain model with UML Class diagram.
- Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
- Identify the business activities and develop an UML Activity diagram.
- Design the State Chart diagram

Projects

1. ATM System
2. Online Quiz System
3. Online Ticket Reservation System

Week 1-2: Model use case diagrams for the above specified projects

Week 3-4: Model class diagrams for the above specified projects

Week 5-6: Model activity diagrams for the above specified projects

Week 7-8: Model sequence diagrams for the above specified projects

Week 9-10: Model collaboration diagrams for the above specified projects

Week 11-12: Model state chart diagrams for the above specified projects

Week 13-14: Model component diagrams for the above specified projects

Week 15-16: Model Deployment diagrams for the above specified projects

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(A56211)DATA WAREHOUSE AND DATA MINING LAB

Course Objectives:

- To implement data warehouses for different organizations.
- To analyze the process of preprocessing the data.
- To test the real world data sets using supervised learning and unsupervised learning.
- To determine the performance and accuracy of models.
- To handle small data mining project for a given practical domain.

Week-1: Design multi-dimensional data models namely star, snowflake and Fact constellation schemas for one enterprise (Like banking).

Week-2-3: Apply below preprocessing techniques on given dataset.

Handling Missing Values , Remove records having a NULL value, Replace Numeric attributes by mean value, Remove Nominal attributes having null value, Sampling, Discretization (Binning), Normalization

Week-4: Market basket analysis using Association Rule Mining

Week-5: movie reviews classification using WEKA Tool

Week-6: weather classification using WEKA Tool

Week-7: Multiple regression analysis on sales data set

Week-8: Demonstrate K-means based Clustering in weka

Week-9: Demonstrate hierarchical based Clustering in weka

Week-10: apply classification, cluster technique on time series data sets

Week-11: apply classification, cluster technique on time spatial data sets

Week-12: Demonstrate Outlier detection technique

Week-13-16: Credit Risk Assessment

Description:

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

Course Outcomes:

- The data mining process and important issues around data cleaning, pre-processing and integration.
- The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction

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(A56212) LOGICAL REASONING AND QUANTITATIVE APTITUDE – II

UNIT-I

Data Sufficiency: Problems in which a question on any topic such as Coding-Decoding, Blood Relations, Directions, Arithmetical Reasoning, etc.

Puzzle Test: Classification Type Questions, Seating Arrangements Comparison Type Questions, Sequential Order of Things, Selection Based on given conditions, Family – Based Puzzles, Jumbled Problems.

UNIT-II

Assertions and Reason – Logical Venn Diagrams – Alpha Numeric Sequence puzzle
Cubes and Dice – Analytical Reasoning

UNIT-III

Logical Deduction: Logic, Statement – Arguments, Statement – Assumptions, Statement – Conclusions, Deriving Conclusions from Passages. Clocks & Calendar.

UNIT-IV

Simple Interest: Effect of change of P, R and T on Simple Interest – Compound Interest: Conversion Period, Difference between Compound Interest and Simple Interest – Time and Work – Time and Distance.

UNIT-V

Mensuration: Area of Plane Figures, Volume and Surface Area of solid figures. Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs.

Text Books:

1. Verbal and Non Verbal Reasoning by R.S.Agarwal.
2. Quantitative Aptitude by R.S.Agarwal.
3. Quantitative Aptitude by Abhijit Guha.

Course Outcomes:

Student will be able to:

- Enhance the problem-solving ability of the students focusing on basic concepts of arithmetic, algebra, geometry data analysis.
- Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

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(A57037)ADVANCED DATABASES

Course Objectives:

- Understand the concept of distributed database system.
- Understand basic concepts of XML databases.
- Understand the Basic Concepts of NoSQL databases
- Understand the basic concepts of Cassandra and MongoDB

UNIT - I

Features of Distributed versus Centralized Databases: Principles Of Distributed Databases

- Levels of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases, Parallel Database Systems- Parallel Architectures, Parallel DBMS Techniques, Distributed Database Design, A framework for Distributed Database Design, The Design of Database Fragmentation, The Allocation of Fragments.

UNIT- II

XML Databases: Structure of XML Data, XML Document Schema, Querying and Transformation, API to XML, Storage of XML Data, XML Application.

UNIT- III

Why NoSQL – Aggregate Data Models – More Details on Data Models – Distribution Models – Consistency – Version Stamps – Map Reduce

UNIT- IV

Introduction to Cassandra: ACID, CAP, BASE, Terminology – Data Modelling –CQL.

UNIT - V

Introduction – Getting Started – Creating, Updating and Deleting Documents – Querying.

Text Books:

1. Stefano Ceri, Giuseppe Pelagatti, Distributed Database Principles & Systems, McGraw- Hill. (Unit-I)
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts – 6th Edition – McGrawHill. (Unit-II)
3. Pramod J. Sadalage, Martin Fowler, NoSQL Distilled – A definitive Guide to Emerging World of Polyglot persistence. (Unit-III)
4. Russell Bradberry, Eric Lubow, Practical Cassandra - A Practical Approach, Addison Wesley, 2014. (Unit-IV)
5. Kristina Chodorow, MongoDB: The Definitive Guide, 2nd Edition, O'REILLY. (Unit-V)

Reference Books:

1. M. Tamer Özsu, Distributed Database Systems, 3rd Edition, Pearson Education.
2. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database systems, 5th Editions, Pearson education, 2008.
3. Raghurama Krishnan, Database Management Systems, Johannes Gehrke, TMH, 3rd Edition.
4. Kevin Williams, Professional XML Databases, Wrox Press Ltd., 2000
5. Kyle Banker, Peter Bakum, Shaun Verch, Douglas Garrett, Tim Hawkins, MongoDB in Action, Second Edition, Manning Publications, 2016.

6. Eric Redmond, Jim R. Wilson, Seven Databases in Seven Weeks - A Guide to Modern Databases and the NoSQL Movement, Pragmatic Programmers, 2012.
7. Eben Hewitt, Cassandra: The Definitive Guide, O'Reilly', 2011.

Course Outcomes:

- Understand the concepts of Distributed databases.
- Design XML databases and querying.
- Understands NoSQL database concepts and their necessity and usage.
- Designing and querying the Cassandra and MongoDB databases.

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(A57038) INFORMATION SECURITY

Course Objectives:

- Analyze the importance of information Security in real world.
- Compare and analyze different encryption Algorithms.
- Summarize authentication functions using MAC and Hash.
- Analyze security importance of various web applications.
- Categorize various types of intruders and viruses

UNIT - I

Information Security: Introduction, History of Information security, What is Security, CNSS Security Model, Components of Information System, Balancing Information Security and Access, Approaches to Information Security Implementation, The Security Systems Development Life Cycle.

UNIT - II

Cryptography: Concepts and Techniques, symmetric and asymmetric key cryptography, steganography, Symmetric key Ciphers: DES structure, DES Analysis, Security of DES, variants of DES, Block cipher modes of operation , AES structure, Analysis of AES , Key distribution Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Analysis of RSA, Diffie-Hellman Key exchange.

UNIT - III

Message Authentication and Hash Functions: Authentication requirements and functions, MAC and Hash Functions, MAC Algorithms: Secure Hash Algorithm, Whirlpool, HMAC, Digital signatures, X.509, Kerberos.

UNIT - IV

Security at layers (Network, Transport, Application): IPSec, Secure Socket Layer(SSL), Transport Layer Security(TLS), Secure Electronic Transaction(SET), Pretty Good Privacy(PGP), S/MIME.

UNIT - V

Intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls.

Text Books:

1. Michael E. Whitman, Herbert J. Mattord, Principles of Information Security, CENGAGE Learning, 4th Edition.
2. William Stallings, Cryptography and Network Security, Pearson Education, 4th Edition

Reference Books:

1. C K Shyamala, N Harini, Dr T R Padmanabhan, Cryptography and Network Security: Wiley India, 1st Edition.
2. Bernard Menezes, Network Security and Cryptography: CENGAGE Learning
3. AtulKahate, Cryptography and Network Security: McGraw Hill, 2nd Edition

Course Outcomes:

- Analyze the importance of information Security in real world.
- Designing and analysis of different encryption Algorithms.

- Implementation of MAC and Hash functions, security at different layers of a network.
- Explore different types of intruders and viruses

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(A57039)BIG DATA ANALYTICS

Course Objectives:

- To introduce the concepts of Big Data Analytics.
- To introduce the concept of Big Data Architecture
- To introduce tools/algorithms that are available for a variety of analytics.
- To introduce the Database for Modern Web.

UNIT – I

INTRODUCTION TO BIG DATA

Introduction –distributed file system –Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce

UNIT – II

INTRODUCTION TO HADOOP AND HADOOP ARCHITECTURE

Big Data – Apache Hadoop & Hadoop EcoSystem, Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization

UNIT – III

HDFS, HIVE AND HIVEQL, HBASE HDFS

Overview, Installation and Shell, Java API; Hive Architecture and Installation, Comparison with Traditional Database, HiveQL Querying Data, Sorting And Aggregating, Map Reduce Scripts, Joins & Sub queries, HBase concepts, Advanced Usage, Schema Design, Advance Indexing, PIG, Zookeeper , how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

UNIT –IV

SPARK

Introduction to Data Analysis with Spark, Downloading Spark and Getting Started, Programming with RDDs, Machine Learning with MLlib.

NoSQL

What is it? Where It is Used Types of NoSQL databases, Why NoSQL? Advantages of NoSQL, Use of NoSQL in Industry, SQL vs NoSQL, NewSQL

UNIT –IV

DATA BASE FOR THE MODERN WEB

Introduction to MongoDB key features, Core Server tools, MongoDB through the JavaScript's Shell, Creating and Querying through Indexes, Document-Oriented, principles of schema design, Constructing queries on Databases, collections and Documents , MongoDB Query Language.

Text Books:

1. Boris lublinsky, Kevin t. Smith, AlexeyYakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk derooset al. , "Understanding Big data", McGraw Hill, 2012.
3. BIG Data and Analytics , Sima Acharya, Subhashini Chhellappan, Willey
4. MongoDB in Action, Kyle Banker,Piter Bakkum , Shaun Verch, Dream tech Press
5. Tom White , "HADOOP: The definitive Guide", O Reilly 2012.
6. VigneshPrajapati, "Big Data Analytics with R and Hadoop", Packet Publishing 2013.
<http://www.bigdatauniversity.com/>
7. Learning Spark: Lightning Fast Big Data Analysis Paperback by Holden Karau

Reference Books:

1. Michael Minelli, Michele Chambers, Ambiga Dhiraj, JimStogdill, "BigData BigAnalytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", 1st

Edition, Wiley Publications, 2013

2. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing, 2012
3. Pete Warden, "Big Data Glossary", O'Reilly, 2011.

Course Outcomes:

- Know about sources of BigData and Analyzing Tools.
- Map statistical methods to analyze huge data.
- Know the other frameworks in Distributed File Systems.
- Know to create cluster in Hadoop distributed file system.
- Apply Map Reduction in HDFS.

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(A57040) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Objectives:

- To explain the basic principles of managerial economics, financial accounting and current business environment underlying business decision making.

UNIT - 1

Introduction to Managerial Economics: Definition, Nature and scope of Managerial Economics, Demand Analysis- Demand Determinants, Law of Demand and its exceptions.

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Methods of Demand Forecasting (Survey Methods, Statistical Methods, Expert Opinion Method, Test Marketing, Controlled Experiments, Judgmental Approach to Demand Forecasting)

UNIT – II

Theory of Production and Cost Analysis: Production Function - Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economics of Scale.

Cost Analysis: Cost concepts, Opportunity Cost, Out of Pocket Costs vs. Imputed Costs. Breakeven Analysis (BEA) - Determination of Breakeven Point (simple problems), Managerial Significance and limitations of BEA.

UNIT – III

Market Structures&Pricing Policies:Market structures: Types of Competition, Features of Perfect Competition, Monopoly and Monopolistic Competition, Pric- Output determination in Perfect Competition and monopoly.

Objectives and Policies of Pricing: Objectives of pricing, Methods of Pricing - Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two - Part Pricing, Block Pricing, Peak Load Pricing, Cross Subsidization.

UNIT - IV

Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working Capital requirements. Nature and scope of Capital Budgeting, features of Capital budgeting proposals, Methods of Capital Budgeting- Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method, Profitability Index, Internal Rate of Return (simple problems).

UNIT - V

Introduction to Financial Accounting: Accounting, Double- Entry Book Keeping, Journal, Ledger, and Trial Balance, Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Financial Analysis through ratios: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt - Equity, Interest Coverage Ratio), and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Profit Ratio, P/E Ratio and EPS).

Text Books :

1. Aryasri, Managerial Economics and Financial Analysis, TMH, 2012.
2. Varshney&Maheshwari, Managerial Economics, Sultan Chand& Sons, 2014.
3. S.A. Siddiqui and A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age International Publishers, Hyderabad, 2013

Reference Books :

1. Raghunatha Reddy &Narasimhachary, Managerial Economics & Financial Analysis, Scitech, 2009.
2. V. Rajasekarn& R. Lalitha, Financial Accounting, Pearson Education, New Delhi, 2010.
3. Domnick Salvatore, Managerial Economics in a Global Economy, 4th Edition, Cengage, 2009.
4. Subhash Sharma & M. P. Vittal, Financial Accounting for Management, Text & Cases, Machmillan, 2012.
5. S. N. Maheshwari& S. K. Maheshwari, Financial Accounting, Vikas 2012.
6. Truet and Truet, Managerial Economics; Analysis, Problems and Cases, Wiley, 2012.
7. Dwivedi, Managerial Economics, Vikas 2012.
8. M. Kasi Reddy and S.Saraswathi, Managerial Economics and Financial Accounting, PHI, 2012.
9. Erich A. Helfert, Techniques of Financial Analysis, Jalco, 2007.

Codes / Tables: Present Value Tables need to be permitted into the Examination Hall.

Course Outcomes :

- By the end of this course the students will be able to assess the costs useful for managerial decision making and
- Determine Break Even Point (BEP) of an enterprise, the process & principles of accounting and
- Prepare Journal, Ledger, Trial Balance and
- Analyze, interpret & comment on the financial statements of a business enterprise by using ratios.

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(A57041)IMAGE PROCESSING (ELECTIVE – II)

Course Objectives:

- To learn the fundamentals of digital image processing and algorithms.
- To understand transformations and spatial operations in digital image processing.
- To implement basic image processing algorithms.

UNIT –I

Fundamental steps of image processing, components of an image processing of system, the image model and image acquisition, sampling and quantization, station ship between pixels, distance functions, scanner.

UNIT –II

Statistical and spatial operations, Grey level transformations, histogram equalization, smoothing & sharpening-spatial filters, frequency domain filters, homomorphic filtering, image filtering & restoration.

- Inverse and weiner filtering. FIR weiner filter.
- Filtering using image transforms, smoothing splines and interpolation.

UNIT –III

Morphological and other area operations, basic morphological operations, opening and closing operations, dilation erosion, Hit or Miss transform, morphological algorithms, extension to grey scale images.

Segmentation and Edge detection region operations, basic edge detection, second order detection, crack edge detection, gradient operators, compass and laplace operators, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersheds.

UNIT –IV

Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression, image data compression-predictive technique, pixel coding, transfer coding theory, lossy and lossless predictive type coding.

Basics of color image processing, pseudo color image processing, color transformation, color smoothing and sharpening, color segmentation, color image compression, compression standards.

UNIT –V

Image Transforms - Fourier, DFT, DCT, DST, Haar, Hotelling, Karhunen - Loeve, Walsh, Hadamard, Slant. **Representation and Description** - Chain codes, Polygonal approximation, Signatures Boundary Segments, Skeltons, Boundary Descriptors, Regional Descriptors, Relational Descriptors, PCA.

Text Books:

1. Digital Image Processing – by Rafael.C.Gonzalez & Richard E.Woods, 3rd edition, Pearson Education, 2008.
2. Digital Image Processing, M.Anji Reddy, Y.Hari Shankar, BS Publications.
3. Fundamentals of Digital Image Processing – by A.K. Jain, PHI.

Reference Books:

1. Digital Image Processing – William K, Part I - John Wiley edition.
2. Digital Image Processing using MATLAB – by Rafael.C.Gonzalez, Richard E.Woods, & Steven L.Eddins, Pearson Education, 2006
3. Digital Image Processing, Kenneth R. Castleman, Pearson Education, 2007

Course Outcomes:

- To acquire the fundamental concepts of a digital image processing system.
- To identify and exploit analogies between the mathematical tools used for 1D and 2D signal analysis and processing.
- To analyze 2D signals in the frequency domain through the Fourier transform
- To design and implement algorithms for digital image processing operations such as histogram equalization, enhancement, restoration, filtering, and de-noising.
- To acquire an appreciation for the image processing issues and techniques and be able to apply these techniques to real world problems

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(A57042) INFORMATION RETRIEVAL SYSTEMS (ELECTIVE – II)

Course Objectives:

- This course studies the basic principles and practical algorithms used for information retrieval and text mining
- To understand the functions of Information retrieval
- To provide exploration of information retrieval systems' evaluation tools
- To provide hands-on experience in evaluating search engines to solve computational search problems.
- To understand the complexity of Information Retrieval Systems.

UNIT – I

Introduction to Information Retrieval Systems: Definition, Objectives, functional overview, Relation to Database Management system. **IRS capabilities:** Search capabilities, Browse Capabilities, Miscellaneous Capabilities

UNIT – II

Cataloging and Indexing: History of objectives of Indexing, indexing process, automatic indexing. **Data Structure:** Introduction to Data structure, Stemming Algorithms, Invert file system, N-Gram Data structure, PAT data structure, Hypertext and XML data structure

UNIT- III

Automatic Indexing: Classes of Automatic indexing, Statistical indexing, Natural language, concept Indexing, Hypertext Linkage. **Document and Term Clustering:** Introduction to clustering, Thesaurus Generation, Manual clustering, Automatic term clustering

UNIT – IV

User Search Techniques: Searching statement and binding, Similarity Measurement and Ranking, Relevance Feedback, Selective dissemination of information search, weighted searches of Boolean system. **Information Visualization:** introduction to information visualization, Cognition and perception

UNIT – V

Text Search Algorithms: Introduction to Text search techniques, Software text search algorithms, hardware text search system. **Multimedia information retrieval:** Spoken language audio retrieval, Non- speech audio retrieval, Graph Retrieval, Imagery retrieval, video retrieval

Text Book:

1. Gerald J.Kowalski, Mark T. Maybury, Information storage and retrieval systems, theory and implementation, 2nd Edition, Springer publications.

Reference Books:

1. Christopher D. Manning and Prabhakar, Raghavan, Introduction to information Retrieval, Cambridge University Press, 2008.
2. Ricardo baeza-Yates, Modern information retrieval, Pearson Education, 2007.
3. Robert Korthage, Information storage and Retrieval, John wiley & sons.

Course Outcomes:

- Acquire the knowledge of information retrieval system and its capabilities
- Comprehend the knowledge of indexing and Data structure that can be used for storing the data

- Know the concept of indexing and clustering of the information
- Understand the searching techniques and visualization
- Have a handle on algorithms for text searching and multimedia retrieval

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(A57043)CYBER FORENSICS (ELECTIVE – II)

Course Objectives:

- To Professionalize and advance the science of cyber security ,digital and computer forensics
- To set high forensics and ethical standers for cyber security.

UNIT – I

Computer Forensics Fundamentals: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement ,Computer Forensic Technology , Types of Business Computer Forensic Technology Computer Forensics Evidence and Capture: Data Recovery Defined ,Data Back-up and Recovery , The Role of Back-up in Data Recovery , The Data-Recovery Solution.

UNIT- II

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options, Obstacles ,Types of Evidence , The Rules of Evidence , Volatile Evidence General Procedure , Collection and Archiving , Methods of Collection , Artifacts Collection Steps,

Controlling Contamination: The Chain of Custody Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene , Computer Evidence Processing Steps, Legal Aspects of Collecting and Preserving Computer Forensic Evidence Computer Image Verification and Authentication: Special Needs of Evidential Authentication , Practical Consideration ,Practical Implementation.

UNIT- III

Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

Processing Crime and Incident Scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case

UNIT-IV

Current Computer Forensic tools: evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools .

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

UNIT-V

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines

Text Books:

1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

Reference Books:

1. Real Digital Forensics by Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Addison-Wesley Pearson Education
2. Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.
3. Computer Evidence Collection & Presentation by Christopher L.T. Brown, Firewall Media.
4. Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
5. Software Forensics Collecting Evidence from the Scene of a Digital Crime by Robert M.Slade, TMH 2005
6. Windows Forensics by Chad Steel, Wiley India Edition.

Course Outcomes:

- Students will understand the usage of computers in forensic, and how to use various forensic tools for a wide variety of investigations.
- It gives an opportunity to students to continue their zeal in research in computer forensics

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(A57044)ADHOC SENSOR NETWORKS (ELECTIVE – III)

Course Objectives:

- To understand the concepts of Ad hoc sensor networks
- To understand the MAC and transport protocols for ad hoc networks
- To understand the security protocols in Adhoc sensor networks
- To understand the applications of ad hoc and sensor networks

UNIT –I

Introduction to Ad Hoc Networks - Characteristics of MANETs, Applications of MANETs and Challenges of MANETs.

Routing in MANETs - Criteria for classification, Taxonomy of MANET routing algorithms, Topology-based routing algorithms-**Proactive**: DSDV, WRP; **Reactive**: DSR, AODV, TORA; Hybrid: ZRP; Position-based routing algorithms-**Location Services**-DREAM, Quorum-based, GLS; **Forwarding Strategies**: Greedy Packet, Restricted Directional Flooding-DREAM, LAR; **Other routing algorithms**-QoS Routing, CEDAR.

UNIT –II

Data Transmission - Broadcast Storm Problem, **Rebroadcasting Schemes**-Simple-flooding, Probability-based Methods, Area-based Methods, Neighbor Knowledge-based: SBA, Multipoint Relaying, AHBP. **Multicasting**: **Tree-based**: AMRIS, MAODV; **Mesh-based**: ODMRP, CAMP; **Hybrid**: AMRoute, MCEDAR and **Geocasting**: Data-transmission Oriented-LBM; Route Creation Oriented-GeoTORA, MGR.

UNIT –III

TCP over Ad Hoc TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc

Basics of Wireless, Sensors and Applications: Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer.

UNIT –IV

Data Retrieval in Sensor Networks: Routing layer, Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs, Sensor Networks and mobile robots.

UNIT –V

Security - Security in Ad Hoc networks, Key management, Secure routing, Cooperation in MANETs, Intrusion Detection systems.

Text Books:

1. Ad Hoc and Sensor Networks – Theory and Applications, Carlos Corderio Dharma P. Aggarwal, World Scientific Publications, March 2006, ISBN – 981-256-681-3
2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science, ISBN – 978-1-55860-914-3 (Morgan Kaufman)

Reference Books:

1. Carlos demoraiscordeiro, Dharma Prakash Agrawal, Adhoc Sensor Networks-Theory and Applications(2nd edition),.
2. Subir Kumar Sarkar, Wireless Ad hoc Mobile Wireless Networks – Principles, Protocols and Applications , Auerbach Publications, Taylor & Francis Group, 2008
3. Jagannathan Sarangapani , Wireless Ad hoc and Sensor Networks – Protocols, Performance and Control CRC Press, Taylor & Francis Group, 2010.

Course Outcomes:

- Apply the concepts of Ad hoc sensor networks.
- Analyse various MAC protocols for ad hoc sensor networks.
- Create new architecture of Wireless sensor networks.
- Design security protocols for Ad hoc sensor networks.

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(A57045)SOFTWARE TESTING (ELECTIVE – III)

Course Objectives:

- Understand fundamentals of Software testing.
- To understand Path, Transaction, Dataflow & Domain testing Strategies.
- To analyze node reduction algorithm.
- To explore the logic & state testing strategies.
- Acquire knowledge on various automated testing tools

UNIT – I

Software Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy.

Building Software Testing Process: Software Testing Guidelines, workbench concept, customizing the Software Testing Process, Process Preparation checklist.

UNIT – II

Software Testing Techniques: Dynamic Testing – Black Box testing techniques, White Box testing techniques, Static testing, Validation Activities, Regression testing.

UNIT –III

Software Testing Tools: Selecting and Installing Software Testing tools ,Automation and Testing Tools, Load Runner, Win runner and Rational Testing Tools, Skill test, Java Testing Tools, JMetra, JUNIT and Cactus.

UNIT –IV

Testing Process Seven Step Testing Process – I: Overview of the Software Testing Process, Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing.

UNIT –V

Seven Step Testing Process – II: Analyzing and Reporting Test results, Acceptance and Operational Testing, Post-Implementation Analysis

Specialized Testing Responsibilities: Software Development Methodologies, Testing Client/Server Systems

Text Books:

1. Effective Methods for Software Testing, Third edition, *William E. Perry*, Wiley India, 2009.
2. Software Testing – Principles and Practices, Naresh Chauhan, Oxford University Press, 2010.

Reference Books:

1. Glenford Myers , The art of Software testing, 2nd edition, 2004.
2. Brain Marrick, The craft of software testing, 1st edition, Pearson Education.
3. N.Chauhan, Software Testing-, 1stedition., Oxford University Press.

Course Outcomes:

- Prioritize & categorize the bugs and take necessary measures.
- Apply Path, Transaction, and Dataflow & Domain testing Strategies.
- Identify Number of test cases by applying node reduction algorithm.
- Apply logic & state testing strategies.
- Understand various automated testing tools.

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(A57046)SOFTWARE DEVELOPMENT FOR PORTABLE DEVICES (ELECTIVE – III)

Course Objectives:

- Explore both theoretical and practical issues of mobile computing.
- Understand the main components of an Android application and its entire life Cycle.
- Use external resources, manifesting adapters and intents.
- Understand Android persistent storage and techniques: databases, and Content Providers.

UNIT –I

Introduction to Mobile Computing, novel applications, limitations, and architecture. GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT –II

Introduction to Android, Features of Android, The development framework: Understanding the Android Software Stack, Android Application Architecture; the Dalvik Virtual Machine, Creating First Android Application, Types of Android Applications, Android Development Tools: The Android Virtual Device Manager, Android Emulator, The Dalvik Debug Monitor Service.

UNIT –III

Creating applications and Activities: Introduction to the application Manifest File, Using the Manifest Editor, Externalizing Resources: Creating Resources - Simple Values, Drawables, Layouts, Menus, Animations. The Android Activity Life cycle;

Building User Interfaces: Fundamental Android UI design, Introducing Layouts: Defining Layouts, Using Layouts to Create Device Independent User Interfaces, Optimizing Layouts.

UNIT –IV

Databases and Content Providers: Introduction to Android Databases, Introducing SQLite, Content Values and Cursors, working with SQLite Databases - Introducing the SQLiteOpenHelper, Querying a Database, Extracting Values from a Cursor, Adding, Updating, and Removing Rows, Creating Content Providers, Using Content Providers - Introducing the Content Resolver, Querying Content Providers, Adding, Deleting, and Updating Content

UNIT –V

Maps and Location based services: Using the location based services, Selecting a Location Provider, Selecting a Location provider, Finding current location;

Creating Map-Based Activities: Introducing Map View and Map Activity, Creating a Map-Based Activity, Maps and Fragments

Sending and receiving SMS using SMS manager:

SMS definition, basic trajectories of SMS validity period of SMS, use of SMS marketing, sending SMS using INTENTS , SMS gateways, SMS manager in windows, Android& IOS

Text Books:

1. JochenH.Schiller, Mobile Communications, , Second edition, Pearson Publication 2004.
2. Reto Meier , Professional Android 4 Application Development, 1st Edition,Wrox Press,Wiley Publishing, 2014

Reference Books:

1. PradeepKothari,Android Application Development (with Kitkat Support), Black Book, 2014,Dreamtech Press publisher,Kogent Learning Inc., 2014
2. Erik Hellman, Android Programming: Pushing the Limits, , 1st Edition, Wiley Publications,

2014.

3. Mike Wolfson, Android Developer Tools Essentials, , O'Reilly Edition, 1st Edition, 2013.

Course Outcomes:

- Analyze the architecture and technical challenges of mobile devices and cellular wireless communications
- Analyze architecture of android and current trends in mobile operating systems.
- Apply suitable software tools and APIs for the development User Interface of a particular mobile application.
- Develop and design apps for mobile devices using SQLite Database.
- Apply the location based service and telephony in android applications

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(A57213) INFORMATION SECURITY LAB

Course Objectives:

- Understand the Security Scanner through NMAP
 - Explain the packet analyzer.
 - Understand different encryption algorithms.
 - Implement simple encryption algorithms using C
 - Understands brute force attack
- Software Requirements: NMAP, WIRESHARK, JCRYPT TOOL.

Week 1

Installation of NMAP.

Week 2

1. Implement port scanning with NMAP

Week 3

Perform the following using NMAP

- Find ports on a system
- Find active machines
- Find the version of remote OS.

Week 4

Installation of Wire shark.

Week 5

Perform an experiment to sniff for router traffic by using Wire Shark

Week 6, 7

Implement Simple Data Encryption Standard (SDS) Algorithm through C program

Week 8,9

Implement Diffie–Hellman key exchange algorithm through C program.

Week 10

Installation of Jcrypt tool

Week 11

Implement DES algorithm using Jcrypt tool

Week 12

Implement RSA algorithm using Jcrypt tool

Week 13

Implement HASH algorithm using Jcrypt tool

Week 14

Implement SHA1 algorithm using Jcrypt tool

Week 15

Implement brute force algorithm in C .

Course outcomes:

- Implements port scanning.
- Performs security scanning and network exploration
- Analysis of packet protocols, IP spoofing.
- Implements various encryption algorithms.
- Illustrates PGP and digital signature.

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(A58031)MULTIMEDIA COMPUTING

Course Objectives:

- To understand properties of multimedia & characteristics of data streams.
- To understand basic concepts of sound and audio.
- To know representation of digital image and its applications.
- To outline various video formats in multimedia applications.
- To list out various data compression techniques

UNIT –I

Introduction - Branch-over lapping Aspects of multimedia, Global structure of multimedia, data streams: medium, main properties of multimedia system, multimedia, traditional data streams characteristics; data streams characteristics for continuous media

UNIT –II

Sounds /Audio: Basic sound concepts: computer representation of sounds, audio Formats, music: MIDI basic concepts, MIDI devices, MIDI messages, MIDI and SMPTE timing standards, MIDI software, speech: speech generation, speech analysis, speech transmission.

UNIT –III

Image and graphics: basic concepts, digital image representation, image format, graphic format, computer image processing, image synthesis, image analysis, image transmission.

UNIT –IV

Video and animation: Video signal representation, computer video format, television: conventional system, enhanced definition system, high –definition system, transmission Computer –based animation: Basic concepts, animation languages, method of controlling animation, display of animation, transmission of animation.

Unit –V

Data compression: storage space, coding requirements, Source, entropy and hmode coding, compression techniques: JPEG,H.261(PX64),MPEG,DVI

Text Book:

1. Multimedia: computing, communication and Applications, Ralf steinmetz and klaranahrstedt.

Reference Books:

1. Z.N. Li and M.S. Drew, Fundamentals of Multimedia. Prentice Hall, 2003.
2. K. Jeffay and H. Zhang, Readings in Multimedia Computing and Networking. Morgan Kaufmann, 2002.

Course Outcomes:

- Analyze various data streams in multimedia.
- Analyze speech recognition in sound/ audio.
- Edit graphic files using graphics software to improve the images and analysis of image.
- Develop visual effects & rendering effects by using animation.
- Apply data compression techniques & tools in real time applications

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(A58032)ENTREPRENEURSHIP (ELECTIVE – IV)

Course Objective:

- To inspire students to become entrepreneurs so that they emerge as job providers rather than job seekers.

UNIT-I

Introduction: Understanding Entrepreneurial Mindset, the Evolution of Entrepreneurship- Approaches to Entrepreneurship, Process Approach, Twenty First Century trends in Entrepreneurship.

UNIT -II

Individual and Corporate Entrepreneurship: The Individual Entrepreneurial Mind-set and Personality, The Entrepreneurial Journey, Stress and the Entrepreneur, The Entrepreneurial Ego, Entrepreneurial Motivations. Corporate Entrepreneurial Mind set, the Nature of Corporate Entrepreneur- Conceptualization of Corporate Entrepreneurship Strategy, Sustaining Corporate Entrepreneurship.

UNIT-III

Launching Entrepreneurial Ventures: Opportunities Identification- Entrepreneurial Imagination and Creativity, The Nature of the Creativity Process, Innovation and Entrepreneurship. Methods to Initiate Ventures, Creating new ventures, Acquiring an Established Entrepreneurial Venture, Franchising, Hybrid Disadvantage of Franchising.

UNIT-IV

Legal Challenges of Entrepreneurship: Intellectual Property Protection-Patents, Copyrights, Trademarks and Trade Secrets, Avoiding Trademark Pitfalls. Formulation of the Entrepreneurial Plan, The Challenges of New Venture Start-ups, Poor Financial Understanding, Critical factors for New Venture Development, The Evaluation Process, Feasibility Criteria Approach.

UNIT-V

Strategic Perspectives in Entrepreneurship: Strategic Planning-Strategic Actions- Strategic Positioning- Business Stabilization- Building the Adaptive Firms-Understanding the Growth Stage-Unique Managerial Concern of Growing Ventures.

Text Book:

- D F Kuratko and T V Rao —Entrepreneurship- A South-Asian Perspective —Cengage Learning,2012

Case References:

- Arya Kumar —Entrepreneurship- Creating and Leading an Entrepreneurial Organization|| Pearson 2012.
- Richard Blundell|| Exploring Entrepreneurship Practices and Perspectives, Oxford, 2011.
- David H Holt|| Entrepreneurship: New Venture Creation|| PHI,2013.

Journals:

- The Journal of Entrepreneurship, Entrepreneurship Development Institute of India, Ahmedabad,
- Journal of Human Values: IIM Calcutta.

References:

- Vasant Desai, Small Scale Industries and Entrepreneurship, HPH, 2012.
- Rajeev Roy, Entrepreneurship, 2e, Oxford, 2012.
- B.Janakiram and M.Rizwana, Entrepreneurship Development: Text & Cases, Excel Books, 2011.
- Stuart Read, Effectual Entrepreneurship, Routledge, 2013.

5. Robert Hisrich et al —Entrepreneurshipll 6e, TMH, 2012.
6. Nandan H, Fundamentals of Entrepreneurship, PHI, 2013
7. Shejwalkar, Entrepreneurship Development, Everest, 2011
8. Khanka, Entrepreneurship Development, S.Chand, 2012

Course Outcomes:

- Have the knowledge on various concepts of business management and approaches.
- Understand and analyze the interconnections between the development of key functional areas of business organization and the management thought process.
- Acquire team management skills and to become a competent leader, who possesses complex and integrated real world skills.
- Be ethically conscious and socially responsible managers, capable of contributing to the development of the nation and quality of life.

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(A58033) ARTIFICIAL INTELLIGENCE (ELECTIVE – IV)

Course Objectives:

- To learn the distinction between optimal reasoning Vs. human like reasoning
- To understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
- To learn different knowledge representation techniques
- To understand the applications of AI, namely game playing, theorem proving, expert systems, machine learning and natural language processing

UNIT – I

Introduction:

AI problems, The Underlying Assumption, AI Techniques, The Level of the Model, Criteria for Success

Problems, Problem Spaces and Search: Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs

Heuristic Search Techniques:

Generate – and – Test, Hill Climbing, Best – First Search, Problem Reduction, Constraint Satisfaction, Means-Ends Analysis.

UNIT –II

Knowledge Representation:

Issues in Knowledge Representation, Representing Simple Facts in Predicate Logic, Representing Instance and ISA Relations, Computable Functions and Predicates, Resolution, Natural Deduction

Representing Knowledge Using Rules: Procedural Vs Declarative Knowledge, Logic Programming, Forward Vs Backward Reasoning, Matching, Control Knowledge

Weak Slot – and – Filler Structures: semantic nets, frames

Strong Slot – and – Filler Structures: conceptual dependency, scripts, CYC

UNIT – III

Reasoning Techniques: Introduction to Non-monotonic reasoning, Logics for Non-monotonic Reasoning, Implementation Issues, Augmenting a Problem Solver, Implementation of Depth First Search and Breadth First Search, Probability and Bayes Theorem, Certainty Factors and Rule-based Systems, Bayesian Networks.

UNIT –IV

Game Playing: Overview, Minimax Search, Alpha – Beta Cutoffs

Planning System: Overview, The Blocks World, Components of a Planning System, Goal Stack Planning, Hierarchical Planning

Understanding: Understanding as constraint satisfaction, Waltz Algorithm

Natural Language Processing: Introduction, Syntactic Processing, Augmented Transition Networks, Semantic Analysis

UNIT – V

Learning: What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples, Winston's Learning Program, Decision Trees

Expert Systems: Representing and Using Domain Knowledge, Shell, Explanation, Knowledge Acquisition.

Text Book:

1) Artificial Intelligence” 3rd Edition. , E.Rich and K.Knight (TMH)

Reference Books:

- 1) Artificial Intelligence A Modern Approach, Second Edition, Stuart Russell, Peter Norvig, PHI/ Pearson Education.
- 2) Artificial Intelligence and Expert systems – Patterson PHI

Course Outcomes

- Ability to formulate an efficient problem space for a problem expressed in natural language
- Select a search algorithm for a problem and estimate its time and space complexities
- Possess the skill for representing knowledge using the appropriate technique for a given problem
- Possess the ability to apply AI techniques to solve problems of game playing, expert systems, machine learning and natural language processing

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(A58034)SOFT COMPUTING (ELECTIVE – IV)

Course Objectives:

- To learn the key aspects of Soft computing
- To know about the components and building block hypothesis of Genetic algorithm.
- To understand the features of neural network and its applications
- To study the fuzzy logic components
- To gain insight onto Neuro Fuzzy modeling and control.

UNIT –I

Introduction To Soft Computing And Neural Networks : Soft Computing Introduction , Hard computing Vs Soft computing, Artificial intelligence , Developments of ANNs, Neural computing Vs Conventional Computing, SWARM Intelligent system: Strengths and Weakness, Application.

UNIT –II

Artificial Neural Networks: First Generation: Introduction to neural networks, Classification of ANN: Architecture, learning/ Training, Training and Testing Modes, Active/ Transfer function, First-generation neural networks: McCulloch and Pitts Neuron model, Perceptron network. Second Generation: Back propagation neural networks, Kohonen neural networks, Hopfield neural networks.

UNIT–III

Genetic Algorithms: Introduction, Procedures of GAs: Genetic representations, Selection, operators, Mutation, Natural inheritance operators. Working of GAs: Binary or Discrete, Real or Continuous, Genetic algorithms applications: TSP, EPDP, Optimization of weights in ANNs, Applicability of Genetic algorithms: Parallel GA, Convergence proof of GA, evolutionary programming, Working of evolutionary programming.

UNIT-IV

Fuzzy Logic : Introduction to fuzzy logic, Human learning ability, imprecision and uncertainty, Undesirability, Probability theory Vs Possibility Theory, Classical sets and Fuzzy Sets , Fuzzy set Operations, Fuzzy Relations – Fuzzy composition, Structure of Fuzzy inference systems : Fuzzification, Fuzzy propositions, Connectives, Implication relations, Inference procedures and algorithms, De-fuzzification, Assessment of De- fuzzification methods, Fuzzy Controllers: Antecedent/consequent variables, IF/THEN rules and inference, Fuzzy decision making,

UNIT – V

Neuro-Fuzzy Modeling: Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro- Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule base Structure Identification –Neuro-Fuzzy Control.(Text 2)

Text Books:

1. N.P. Padhy, S.P.Simon, Soft Computing, OXFORD University press.
2. S.N.Sivanandam, Introduction to Genetic Algorithms,S.N.Deepa, Wiley, 2007.

Reference Books:

1. Mitchell Melanie, An Introduction to Genetic Algorithm, Prentice Hall, 1998.
2. James A. Freeman and David M. Skapgura, Neural Networks Algorithms, Applications, and

Programming Techniques, Pearson Edition, 2003.

3. S. N. Sivanandam, S. Sumathi and S. N. Deepa, Introduction to Fuzzy Logic using MATLAB, Springer, 2007.

Course Outcomes:

- Acquire the knowledge soft computing and correlation with other computing techniques.
- Comprehend the knowledge of artificial neural networks and its generations.
- Know the concept of genetic algorithms and its applications.
- Understand the Fuzzy logic structure and operations.
- Have a handle on Neuro-fuzzy concepts.

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(A58035)INTERNET OF THINGS (ELECTIVE – V)

Course Objectives:

- Vision and Introduction to IoT.
- Understand IoT Market perspective.
- Data and Knowledge Management and use of Devices in IoT Technology.
- Understand State of the Art – IoT Architecture.
- Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

UNIT –I

Introduction to the Internet of Things-What is the IoT and why is it important? Elements of an IoT ecosystem., Technology drivers, Business drivers. Typical IoT applications, Trends and implications

UNIT –II

Sensors and sensor nodes-Sensing devices. Sensor modules, nodes and systems.

Connectivity and networks Wireless technologies for the IoT, Edge connectivity and protocols, Wireless sensor networks.

UNIT –III

Analytics and applications-Signal processing, real-time and local analytics. Databases, cloud analytics and applications.

UNIT –IV

Industry perspective-Business considerations. Legal challenges.

UNIT –V

IOT lab exercises and mini-project Local processing on the sensor nodes. Connecting devices at the edge and to the cloud. Processing data offline and in the cloud. Mini-project: Designing an IoT system (group exercise)

Text Book:

1. J. Biron and J. Follett, "Foundational Elements of an IoT Solution", O'Reilly Media, 2016.
2. Keysight Technologies, "The Internet of Things: Enabling Technologies and Solutions for Design and Test", Application Note, 2016.
3. Charles Bell, "Beginning Sensor Networks with Arduino and Raspberry Pi", Apress, 2013.
4. D. Evans, "The Internet of Things: How the Next Evolution of the Internet Is Changing Everything", Cisco Internet Business Solutions Group, 2011
5. McKinsey&Company, "The Internet of Things: Mapping the value beyond the hype", McKinsey Global Institute, 2015
6. European Alliance for Innovation (EAI), "Internet of Things: Exploring the potential", Innovation Academy Magazine, Issue No. 03, 2015
7. Digital Greenwich, "Greenwich Smart City Strategy", 2015
8. ITU and Cisco, "Harnessing the Internet of Things for Global Development", A contribution to the UN broadband commission for sustainable development

Reference Books:

1. Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014.
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013

Course Outcomes:

- Explain in a concise manner how the general Internet as well as Internet of Things work.
- Understand constraints and opportunities of wireless and mobile networks for Internet of Things.
- Use basic measurement tools to determine the real-time performance of packet based networks.
- Analyses trade-offs in interconnected wireless embedded sensor networks.

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(A58036) NETWORK SECURITY AND PRIVACY (ELECTIVE – V)

Course Objectives:

- Network security basics, security architecture, and security models.
- Network security planning, risk management and policy
- Choose the most adequate security countermeasures to satisfy specific security requirement in RFIDs and sensor networks
- Identify the most common threats against privacy.

UNIT – I

Fundamentals and Mathematics Of Cryptography Overview - Classical Crypto Systems – Substitution Ciphers – Transposition Ciphers- Stream and Block Ciphers – Introduction to Number Theory – Congruences – Chinese Remainder theorem – Modular Arithmetic-Modular Exponentiation – Fermats and Eulers Theorem - Finite Fields – GF(2ⁿ) Fields.

UNIT – II

Encryption Techniques: Symmetric Encryption Techniques – DES – AES- Public-Key Cryptography and RSA – Key Management - Diffie-Hellman Key Exchange – Elliptic Curve Cryptography – Symmetric Key Distribution – Kerberos - X.509 Authentication Service - differential cryptanalysis - linear cryptanalysis - side channel attack - lattice reduction attack - Merkle- Hellman knapsack attack - Hellman's time-memory tradeoff (TMTO) attack

UNIT – III

Hash Functions And Signatures: Message Authentication and Hash Functions – Description of MD Hash Family – Secure Hash Algorithms – SHA 512 - Digital Signatures and Authentication Protocols – Digital Signature Standard – Process, Services, Attacks on Digital Signature- Digital Signature Schemes.

UNIT – IV

Security Practices: Vulnerability Analysis - Flaw Hypothesis Methodology, NRL taxonomy and Aslam's model - Auditing - Anatomy of an Auditing System - Design of Auditing Systems - Posteriori Design - Auditing mechanisms - Risk Analysis and Management - Disaster Recovery Planning/Incident Response Planning - Intrusion Detection System

UNIT – V

Secure Development: Secure Coding - OWASP/SANS Top Vulnerabilities - Buffer Overflows - Incomplete mediation - XSS - Anti Cross Site Scripting Libraries - Canonical Data Format - Command Injection - Redirection - Inference – Application Controls - Secure Software Development Life Cycle - Testing, Maintenance and Operation - Evaluation of Security Systems

Text Books:

1. William Stallings, "Cryptography and Network Security – Principles and Practices", Pearson Education, Fourth Edition, 2006.
2. OWASP top ten security vulnerabilities: <http://xml.coverpages.org/OWASP-TopTen.pdf>

Reference Books:

1. Mark Stamp, "Information Security: Principles and Practice", Wiley Inter Science, 2011.
2. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Fourth Edition, Pearson Education, 2007.

Course Outcomes:

- Upon Completion of the course, the students should be able to,
- Apply the basic security algorithms required by any computing system.

- Predict the vulnerabilities across any computing system.
- Security solution for any computing system

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(A58037)MACHINE LEARNING (ELECTIVE – V)

Course Objectives:

- To understand the concepts of machine learning
- To understand supervised and unsupervised learning and their applications
- To understand the theoretical and practical aspects of probabilistic graphical models
- To appreciate the concepts and algorithms of reinforcement learning
- To learn aspects of computational learning theory

UNIT –I

INTRODUCTION: Machine Learning - Machine Learning Foundations –Overview – applications - Types of machine learning - basic concepts in machine learning Examples of Machine Learning -Applications - Linear Models for Regression-Linear Basis Function Models - The Bias-Variance Decomposition - Bayesian Linear Regression - Bayesian Model Comparison

UNIT –II

SUPERVISED LEARNING: Linear Models for Classification, Linear Models for Classification - Discriminant Functions -Probabilistic Generative Models - Probabilistic Discriminative Models - Bayesian Logistic Regression.Decision Trees - Classification Trees- Regression Trees - Pruning. Neural Networks -Feed-forward Network Functions - Error Back propagation,RadialBasis Function Networks.

UNIT –III

UNSUPERVISED LEARNING: Clustering- K-means - EM - Mixtures of Gaussians - The EM Algorithm in General -Model selection for latent variable models - high-dimensional spaces -- The Curse of Dimensionality -Dimensionality Reduction - Factor analysis - Principal Component Analysis - Probabilistic PCA- Independent components analysis

UNIT –IV

PROBABILISTIC GRAPHICAL MODELS : Directed Graphical Models - Bayesian Networks - Exploiting Independence Properties - From Distributions to Graphs - Examples -Markov Random Fields - Inference in Graphical Models - Learning –Naive Bayes classifiers-Markov Models – Hidden Markov Models.

UNIT –V

ADVANCED LEARNING: Sampling – Basic sampling methods, Reinforcement Learning- K-Armed Bandit Elements - Model-Based Learning- Value Iteration- Policy Iteration. Temporal Difference Learning Exploration Strategies- Deterministic and Non- deterministic Rewards and Actions. Semi - Supervised Learning. Computational Learning Theory

Text Books:

1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2006
2. Tom Mitchell, Machine Learning, McGraw-Hill, 1997

Reference Books:

1. Kevin P. Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012
2. EthemAlpaydin, Introduction to Machine Learning, Prentice Hall of India, 2005
3. Hastie, Tibshirani, Friedman, The Elements of Statistical Learning, 2nd Edition, Springer, 2008

4. Stephen Marsland, Machine Learning –An Algorithmic Perspective, CRC Press, 2009

Course Outcomes:

- To implement a neural network for an application of your choice using an available tool
- To implement probabilistic discriminative and generative algorithms for an application of your choice and analyze the results
- To use a tool to implement typical clustering algorithms for different types of applications
- To design and implement an HMM for a sequence model type of application
- To identify applications suitable for different types of machine learning with suitable Justification