Don Bosco College (Co-Ed)

Department of Computer Science
Guezou Nagar, Athanavur, Yelagiri Hills – 635 853.

B.SC. (CS) – PROGRAM HANDBOOK
UNDER CBCS
(With effect from 2022-2023)

Overview

B.Sc. Computer Science is a 3-year undergraduate program, which deals with subjects and topics related to computer science and services. Technological implementation of computer systems is the main agenda of the program. The program ranges widely from creating quality professionals and research fellows who are working in every sector of the world today. The B.Sc. (Computer Sc.) program has been designed to cater to the ever changing demands of software technology along with necessary inputs to make them adopt to the needs of recent trends of technology besides it offers basic programing languages such as C, C++ and Java thus students acquire professional and technical skills, which enable them to produce mini projects. It also offers recent tools i.e. Weka, Data modeling tools, VB, Photoshop, Audacity, Xampp and Dreamweaver. These tools help students to design software projects, to develop dynamic webpages locally, learn basics knowledge about mobile computing and networks. Thus a computer science graduate would be able to satisfy the demands such as aptitude and technical skills, leadership skills, teamwork, communication skills of the various IT sectors and Industry and continuously work to sustain and improve their professional competencies to succeed in a competitive professional environment and appreciate business and social environments of information technology development.

Vision

An abode where education and expertise in ICT culminate to achieve integrity and excellence.

Mission

Stimulate the student community with integral development in all dimensions, knowledge and skill set to become employable in the competitive world.

Objectives

1. To offer programmers of study that develops employable youth with integral values for life.
2. To conduct co-curricular, extra-curricular and extension activities for holistic formation of the students.
3. To motivate students to become agents of social transformation.
4. To partner with institutions and execute subject-based projects to develop rural India.
5. To develop economic programmers for the sustainability of the institute.

Strategies

1. Create an ambience of trust so that students feel free to express themselves.
2. Help students to be more communicative.
3. Support students in software application development for better employability.
4. Support slow/fast learners.
5. Prepare students to present papers at national conferences or symposiums.
6. Encourage students to be tech-savvy.
7. Support students to realize their responsibility in the society.

REGULATIONS

Programme

"Programme" means a course of study leading to the award of a degree in a discipline.

Course

"Course" refers to a paper / practical / subject offered under the degree programme. Each Course is to be designed variously under lectures / tutorials / laboratory or field work / seminar / practical training / Assignments / Term paper or Report writing etc., to meet effective teaching and learning needs.

Credits

The weight age given to each course of study (subject) by the experts of the Board of Studies concerned. The total minimum credits, required for completing a UG program is 140.

Choice Based

All Undergraduate Programmers' offered by Thiruvalluvar University are under Choice Based Credit System. This is to enhance the quality and mobility of the students within and between the Universities in the country and abroad.

Eligibility for Admission to the Course:

Candidate seeking admission to the first year of the UG Degree Course should have passed the Higher Secondary Course Examination (Academic or Vocational) Conducted by the Govt. of Tamil Nadu with Mathematics as a subject or any other Examination accepted as equivalent thereto by the Syndicate subject to such other conditions as may be prescribed.

Duration of the Course

The course shall extend over a period of **three years comprising** of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examination shall be conducted at the end of every semester for the respective subjects. Each semester has 90 working days consisting of 5 teaching hours per working day. Thus, each semester has 450 teaching hours and the whole Programme has 2700 teaching hours.

Medium of Instruction and Examinations

The medium of instruction and examinations for the courses of Part I, II & IV-(i) (a) & (i)(b) shall be the language concerned. For part III & remaining Part IV courses other than modern languages, the medium of instruction shall be either Tamil or English and the medium of examinations is English / Tamil irrespective of the medium of instructions.

PASSING MINIMUM

1. A candidate shall be declared to have passed the whole examination, if the candidate passes in all the theory papers and practical's wherever prescribed as per the scheme of examinations by earning 140 credits in Part I, II, III, IV and V. He / She shall also fulfill the extension activity prescribed by earning 1 credit to qualify for the degree.

2. A candidate should get **not less than 40% in the University (external)** Examination, compulsorily, in any course of Part I, II, III& IV papers. Also the candidate who secures **not less than** 40% marks in the external as well as internal (CIA) examinations put together in any course of Part I, II, III & IV shall be declared to have successfully passed the examination in the subject in theory as well as Practical's.

DISTRIBUTION

Table - 1(A): The following are the distribution of marks for external and internal for University (external) examination and continuous internal assessment and passing minimum marks for **theory papers of UG Programmes**.

UNI. EXAM TOTAL (ESE)	PASSINGMINIMUM FOR UNI.EXAM	CIA TOTAL	PASSING MINIMUM FOR CIA	TOTAL MARKS ALLOTTED	PASSING MINIMUM (UNI.EXAM+CIA)
75	30	25	0	100	40

Table - 1(B): The following are the Distribution of marks for Continuous Internal Assessment in the theory papers of UG Programmes.

S.No.	For Theory - UG courses	Distribution of Marks	
		Assignments	Tests
1	Assignment-1 (First 2 Units of the Syllabus)	10	-
2	Test-1 (First 2 Units of the Syllabus for 1 Hour duration)	-	50
3	Assignment-2 (3^{rd}& 4^{th} Units of the Syllabus)	10	
4	Test-2 (First 4 Units of the Syllabus for 2 Hours duration)	-	50
5	Assignment-2 (5^{th} Unit of the Syllabus)	10	-
6	Test-3 (Entire Syllabus for 3 Hours duration)	-	100
	TOTAL MARKS	30	200
	Marks to be converted to	5	20
	Total Maximum Marks for CIA	25	

Table – 2(A): The following are the distribution of marks for University (external) examinations and continuous internal assessments and passing minimum marks for the practical courses of UG Programmes**.**

UNI. EXAM TOTAL (ESE)	PASSING MINIMUM FOR UNI.EXAM	CIA TOTAL	PASSING MINIMUM FOR CIA	TOTAL MARKS ALLOTTED	PASSING MINIMUM (UNI.EXAM+CIA)
75	30	25	0	100	40

Table – 2(B): The following are the distribution of marks for the Continuous Internal Assessment in UG practical courses.

S.No.	For Practical - UG courses	Distribution of Marks	
		Assignments	Tests
1	Regular maintenance of the Observation note book-1 (Up to the end of I-Semester)	10	-
2	Test-1 (Up to the end of I-Semester for 2 Hours duration)	-	25
3	Regular maintenance of the Observation note book-2 (Up to the end of II-Semester)	10	
4	Test-2 (Up to the end of II-Semester for 2 Hours duration)	-	25
5	Regular maintenance & proper completion of the Record note book	10	-
6	Test-3 (Entire Syllabus following University examination pattern)	-	25
	TOTAL MARKS	30	75
	Marks to be converted to	10	15
	Total Maximum Marks for CIA	25	

QUESTION PAPER PATTERN

The following question paper patterns shall be followed for CBCS pattern syllabi for the candidates admitted from the academic year 2017-2018 onwards.

External Maximum 75 Marks – wherever applicable (Ext.75 + Int.25 = Total. 100)

Section A	Very short answer questions	10X 2=20	10 questions – 2 from each unit
Section B	Short answer questions of either / or type (like 1a (or) 1b)	5X5=25	5 questions – 1 from each unit
Section C	Essay-type questions / Problem (Answer any 3 out of 5)	3X10=30	5 questions – 1 from each unit

NOTE: In Section "C" one of the questions shall be application oriented or a problem, wherever applicable.

GRADING

Once the marks of the CIA and end-semester examinations for each of the course are available, they shall be added. The mark thus obtained shall then be converted to the relevant letter grade, grade point as per the details given below:

Conversion of Marks to Grade Points and Letter Grade (Performance in a Course/Paper)

RANGE OF MARKS	GRADE POINTS	LETTER GRADE	DESCRIPTION
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Distinction
75-79	7.5-7.9	D	
70-74	7.0-7.4	A+	First Class
60-69	6.0-6.9	A	
50-59	5.0-5.9	B	Second Class
40-49	4.0-4.9	C	Third Class
00-39	0.0	U	Re-appear
Absent	0.0	AAA	Absent

Programme Objectives:

1. Graduates will be able to comprehend the concepts learnt and apply in real life situations with analyticalskills.
2. Graduates with acquired skills and enhanced knowledge will be employable/ become entrepreneurs or willpursue higher Education.
3. Graduates with acquired knowledge of modern tools, communicative skills and will be able to contributeeffectively as team members.
4. Graduates are able to read the signs of the time analyze and provide practical solutions.
5. Graduates imbibed with ethical values and social concern will be able to understand and appreciate socialharmony, cultural diversity ensure sustainable environment

Programme Outcomes:

1. Having clear understanding of subject related concepts and apply the same to identify, formulate andanalyze Complex problems.
2. Confident enough to act as a productive contributor for both self and team growth.
3. Able to adapt work environment easily.
4. Clear understanding on Professional and ethical responsibility.
5. Able to work effectively by managing time and provide innovative solutions.
6. Help to understand the market's demand and ability to provide Quality and timely services.
7. Help to Provide Infinite Solutions to same problem.
8. Able to clear any competitive exams for higher education.
9. Able to identify and grab global opportunities.
10. Help to develop Problem solving and to analyze Critical data.

Programme Educational Objectives:

1. To equip the students with World class skills and knowledge about Software and how it rules the IT AndITES industry by providing requisite technical education.
2. To gather business requirement, analyze, and design software which helps to reduce manual errors andensure to deliver quality Product.
3. To help the individuals/students to identify or create opportunity to grow as Professionals in thecompetitive environment.
4. To motivate them to fly high for higher education in renowned universities across the globe.
5. To help the Professionals to go above and beyond to satisfy Company/Clients.

Programme Specific Outcomes:

On Completion of B.Sc. Computer Science Programme, graduates will be able to

1. Understand the technical aspects of Hardware and Software of Computer Science domain and the art ofprogramming.
2. Ability to understand the different programming languages and can be able to apply the same for effectiveresults.
3. Ability to use emerging software techniques of computer science to provide innovative and quick solutionon time.
4. Ability to understand, adjust and adapt with the dynamic technical environment for the growth ofindividual career and IT industry.
5. Ability to utilize social media effectively for learning and use productively.
6. Ability to make the world a better place by developing new software/ languages to support AI.
7. Able to understand the concepts of Niche skills like Python, Big Data, MDM.
8. Able to enter different streams of Computer Science like System engineer, IT Manager, Architect, Gamedeveloper, Mobile Application developer, R&D.
9. Able to adapt the ongoing technical developments.
10. Able to enter any industry as each industry is dependent on Computer Science for design and develop theirideology.

Program structure

(With effect from 2022-2023)

S. No.	Part	Study Components Course Title		Ins. Hrs / week	Credit	Title of the Paper	Maximum Marks		
		SEMESTER I					**CIA**	**Uni. Exam**	**Total**
1.	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2.	II	English (CE)	Paper-1	6	4	**Communicative English I**	25	75	100
3.	III	Core Theory	Paper-1	6	4	Programmingin C	25	75	100
4.	III	Core Practical	Practical-1	3	2	Programmingin CLab	25	75	100
5.	III	Allied -1	Paper-1	7	3	**(tochooseanyone)** 1. MathematicsI 2. Mathematical FoundationsI	25	75	100
6.	**III**	**PE**	**Paper 1**	**6**	**3**	**Professional English I**	**25**	**75**	**100**
7.	IV	Environmental Studies		2	2	Environmental studies	25	75	100
		Sem. Total		**36**	**22**		**175**	**525**	**700**
		SEMESTER II					**CIA**	**Uni. Exam**	**Total**
8.	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
9.	II	English (CE)	Paper-2	4	4	**Communicative English II**	25	75	100
10.	**II**	**NMSDC I : Language Proficiency for Employability**	**Paper-1**	**2**	**2**	**Effective English**	**25**	**75**	**100**
11.	III	Core Theory	Paper-2	5	4	C++& Data Structure	25	75	100
12.	III	Core Practical	Practical-2	2	2	C++ and Data Structures Lab	25	75	100
13.	III	Allied-1	Paper-2	7	5	**(tochooseanyone)** 1. MathematicsII 2. Mathematical Foundations II	25	75	100
14.	**III**	**PE**	**Paper 1**	**6**	**3**	**Professional English II**	25	75	100
15.	IV	Value Education		2	2	Value Education	25	75	100

16.	IV	Soft Skill		2	1	Soft Skill	25	75	100
		Sem. Total		**36**	**27**		**200**	**600**	**800**

S.NO.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
SEMESTER III							**CIA**	**Uni. Exam**	**Total**
17.	I	Language	Paper-3	6	4	Tamil/ OtherLanguages	25	75	100
18.	II	English	Paper-3	6	4	English	25	75	100
19.	III	Core Theory	Paper-3	3	3	Programming in JAVA	25	75	100
20.	III	Core Practical	Practical-3	3	3	Programming in JAVA Lab	25	75	100
21.	III	Allied II	Paper-3	4	3	**(Choose any one)** 1. Physics I 2. Statistical Methods andTheir Applications I	25	75	100
	III	Allied II	Practical	3	0	Physics/Statistics Practical	0	0	0
22.	IV	Skill Based Subject	Paper-1	3	2	Digital Logic Design andComputer Organization	25	75	100
23.	IV	Non-Major Elective	Paper-1	2	2	Introduction to Information Technology	25	75	100
		Sem. Total		**30**	**21**		**175**	**525**	**700**
SEMESTER IV							**CIA**	**Uni. Exam**	**Total**
24.	I	Language	Paper-4	6	4	Tamil/Other Languages	25	75	100
25.	II	English	Paper-4	6	4	English	25	75	100
26.	III	Core Theory	Paper-4	3	3	Relational Database ManagementSystems	25	75	100
27.	III	Core Practical	Practical-4	3	3	RDBMS Lab	25	75	100
28.	III	Allied II	Paper-4	4	3	**(to choose any one)** 1. Physics II 2. Statistical Methods and theirApplications II	25	75	100
29.	III	Allied II	Practical	3	2	Physics/Statistics Practical	25	75	100

30.	IV	**NMSDC II : Digital Skillsfor Employability**	Paper-2	3	2	**Office Fundamentals**	25	75	100
31.	IV	Non-Major Elective	Paper-2	2	2	Internet Technology	25	75	100
		Sem. Total		**30**	**23**		**200**	**600**	**800**

S.NO.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
SEMESTER V							**CIA**	**Uni. Exam**	**Total**
32.	III	Core Theory	Paper-5	6	4	Mobile Application Development	25	75	100
33.	III	Core Theory	Paper-6	6	4	Operating System	25	75	100
34.	III	Core Theory	Paper–7	4	3	Design and Analysis ofAlgorithms	25	75	100
35.	III	Core Practical	Practical-5	4	3	Mobile Applications Development-Lab	25	75	100
36.	III	Core Practical	Practical-6	4	3	Operating System-Lab	25	75	100
37.	III	Internal Elective	Paper-1	3	3	**(tochooseanyone)** 1. Data Mining 2. Information Security 3. Software Testing	25	75	100
38.	IV	Skill Based Subject	Paper-2	3	2	Software Engineering	25	75	100
				30	**22**		**175**	**525**	**700**
SEMESTER VI							**CIA**	**Uni. Exam**	**Total**
39.	III	Core Theory	Paper-8	5	4	Open Source Software	25	75	100
40.	III	Core Theory	Paper-9	4	4	Python Programming	25	75	100
41.	III	Core Practical	Practical-7	4	3	Python Programming Lab	25	75	100
42.	III	Core Practical	Practical-8	4	2	Open Source Programming Lab	25	75	100
43.	III	Project		5	5	Project Work (Group/IndividualProject)	25	75	100

44.	III	Internal Elective	Paper - 2	3	3	**(tochooseanyone)** 1. Big Data Analytics 2. Cryptography 3. Digital Image Processing	25	75	100
45.	III	Internal Elective	Paper - 3	3	3	**(tochooseanyone)** 1. Artificial Intelligence 2. System Software 3. Cloud Computing	25	75	100

46.	**IV**	**NMSDC III : Emerging Technology for Employability -**	**Paper - 3**	**2**	**2**	**(Choose any one)** **• PBL Android App Development** **• Machine Learning**	**25**	**75**	**100**
47.	V	Extension Activities		0	1		100	0	100
		Sem. Total		**30**	**27**		**300**	**600**	**900**
					142				

Part	Subject	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages	4	4	16	100	400
Part II	Communicative English & English	4	4	16	100	400
Part III	Allied (Odd Semester)	2	3	6	100	200
	Allied (Even Semester)	2	5	10	100	200
	Allied Practical	1			100	100
	Electives	3	3	9	100	300
	Core	9	(3-5)	33	100	900
	Core practical	8	(2-3)	21	100	800
	Professional English	2	3	6	100	200
	Compulsory Project (Group/Individual Project)	1	5	5	100	100
Part IV	Environmental Science	1	2	2	100	100
	Soft skill	1	1	1	100	100
	Value Education	1	2	2	100	100
	Lang. & Others /NME	2	2	4	100	200
	Skill Based	4	2	8	100	400
Part V	Extension Activities	1	1	1	100	100
	Total	**46**		**140**		**4600**

FLT10	TAMIL I	Lecture	Practical	Credit
SEM I	LANGUAGE	6	0	4

Nehf;fk;

jkpopd; GJf;ftpijfs; cs;slf;fpagilg;gpyf;fpaq;fis ,g;ghlk; mwpKfk; nra;fpwJ
jkpo; ,yf;fpaj;jpy; Njh;njLf;fg;gl;lkpfKf;fpakhdnra;Al;fs;>ftpijfs;>fijfs;.
ciueilMfpatw;iwf;nfhz;L ,g;ghlk; fl;likf;fg;gl;Ls;sJ. khzhf;fhpd; ,yf;fpaj; NjliycUthf;FtJk;>
jw;rhh;GilamwpitNkk;gLj;JtJk; ,g;ghlj;jpd; Nehf;fkhFk;.
1.khzth;fs; ftpijfw;gjpd; thapyhfmth;fs; ftpijvOjfw;Wf;nfhs;fpwhh;fs;
2.ciueilfw;gjpd; thapyhfthrpf;ff; fw;Wf;nfhs;fpwhh;fs;
3.ehlfk; thrpg;gjpdhy; khzth;fs; kdk; nkhopnka; %ykhfjq;fs; jpwd;fisntspg;gLfpd;wdh;
4.rpWfijgbg;gjpdhy; khzth;fs; thrpf;Fk; gof;fj;jpidngWfpd;whh;fs;
5.nkhopj;jpwd; gapw;rpngWtjpd; %ykhfkhzth;fs; nkhopiagpioapd;wpNgrTk; vOjTk; fw;Wf;nfhs;fpwhh;fs;.

myF – 1 **ftpij**

1. ghujpahh; - neQ;RnghWf;F jpiyNa…
(7 ghly;fs;)
2. ghujpjhrd; - 1. jkpopd; ,dpik
2. rq;fehjk;
3. ftpkzpNjrpa tpehafk;gpsi; s - kyUk; khiyAk; - ‘Nfhtpy; topghL’
4. ftpQh; Rujh - Njd;kio – ‘jiyik jhq;Fk; jkpo;’
5. mg;Jy; uFkhd; - Myhgid – ‘MwhtJ mwpT’
6. K.Nkj;jh - Njrg; gpjhTf;F xU njUg;ghlfdpd; mQ;ryp
7. eh.jduhrd; - me;jfpuhkj;J kdpjd; - ‘J}a;ik kyul;Lk;’
8. Rfpu;juhzp - rpwg;G kz;lyk; - vq;fs; tsehL
9. khyjp ikj;up - mfjp

myF -2 **ciueil**

1. uh.gp.NrJg;gps;is - tho;f;ifAk; ituhf;fpaKk;
2. kapiy rPdp Ntq;flrhkp - goq;fhyj;J mzpfyd;fs;

myF -3 **ehlfk;**

1. mwpQh; mz;zh - ghujk;
2. MW. mofg;gd; - nfhy;ypg;ghit

myF -4 **rpWfij**

1. ehw;fhyp - fp. uh[ehuhazd;
2. tst.Jiuad; - Nryj;jhh; tz;b

myF -5 **nkhopj;jpwd;**

1. mbg;gil ,yf;fzk; - ngah;r;nrhy;> tpidr;nrhy; mwpjy;
2. z-d-e> y-s-o> u-w NtWghL mwpjy;
3. fiyr; nrhy;yhf;fk;
4. gpwnkhopr; nrhy; ePf;fpj; jkpo;r;nrhy; mwpjy;

,yf;fpa tuyhW

ghlg;gFjpia xl;ba ,yf;fpa tuyhW : 20-Mk; E}w;whz;Lf; ftpQh;fs; ftpij> ciueil> ehlfk;> rpWfij Mfpa ,yf;fpaq;fspd; tsh;r;rp epiy.,sepiyg; gl;lg;gbg;G

SEM I	GENERAL ENGLISH	Lecture	Practical	Credit
FLE 10	**COMMUNICATIVE ENGLISH - I**	**6**	**0**	**4**

Course Outcome

CO 1 – The students get to learn more about various ways of using LSRW
CO 2 – Able to understand the proper usage of a language
CO 3 – Will build up interpersonal communication by reinforcing basic of pronunciation
CO 4 – Improve conversational skills
CO 5 – Enable to familiar with the sounds of the English vocabulary, grammer

Course objective

1. Enhance and improve the learner's communication skills by given adequate exposure in LSRW listening, speaking, reading and writing skills and the related sub – skills with study skills and basics of grammar.
2. Comprehend how to discover self and others, the vital role of listening and its challenges.
3. Become fluent in reading aloud, able to understand texts and to as and answer questions, interpret diagrammatic information, develop the summarizing, paraphrasing and writing skills.
4. Explore glossary through research tools- online, e-learning, digital resources.

Unit I (20 hours)

1. Listening and Speaking
a. Introducing self and others
b. Listening for specific information
c. Pronunciation (without phonetic symbols)
i. Essentials of pronunciation
ii. American and British pronunciation

2. Reading and Writing
a. Reading short articles – newspaper reports / fact based articles
i. Skimming and scanning
ii. Diction and tone
iii. Identifying topic sentences
b. Reading aloud: Reading an article/report
c. Journal (Diary) Writing
3. Study Skills – 1
a. Using dictionaries, encyclopedias, thesaurus
4. Grammar in Context:

 Naming and Describing
 Nouns & Pronouns
 Adjectives

Unit II (20 hours)

1. Listening and Speaking
a. Listening with a Purpose
b. Effective Listening
c. Tonal Variation

d. Listening for Information
e. Asking for Information
f. Giving Information
2. Reading and Writing 1.
a. Strategies of Reading:
 Skimming and Scanning
b. Types of Reading:
 Extensive and Intensive Reading
c. Reading a prose passage
d. Reading a poem
e. Reading a short story
2. Paragraphs: Structure and Types
a. What is a Paragraph?
b. Paragraph structure
c. Topic Sentence
d. Unity e. Coherence
f. Connections between Ideas:
 Using Transitional words and expressions
g. Types of Paragraphs
3. Study Skills II:
Using the Internet as a Resource
a. Online search
b. Know the keyword
c. Refine your search

d. Guidelines for using the Resources
e. e-learning resources of Government of India
f. Terms to know
4. Grammar in Context
Involving Action-I
a. Verbs
b. Concord

Unit III (16 hours)
1. Listening and Speaking
a. Giving and following instructions
b. Asking for and giving directions
c. Continuing discussions with connecting ideas
2. Reading and writing
a. Reading feature articles (from newspapers and magazines)
b. Reading to identify point of view and perspective (opinion pieces, editorials etc.)
c. Descriptive writing – writing a short descriptive essay of two to three paragraphs.
3. Grammar in Context:
Involving Action – II
• Verbals - Gerund, Participle, Infinitive
• Modals

Unit IV (16 hours)
1. Listening and Speaking a. Giving and responding to opinions

2. Reading and writing
a. Note taking
b. Narrative writing – writing narrative essays of two to three paragraphs
3. Grammar in Context:
Tense

- Present
- Past
- Future

Unit V (18 hours)
1. Listening and Speaking
a. Participating in a Group Discussion
2. Reading and writing
a. Reading diagrammatic information – interpretations maps, graphs and pie charts
b. Writing short essays using the language of comparison and contrast
3. Grammar in Context:

 Voice (showing the relationship between Tense and Voice)

SEM I	ENGLISH	Lecture	Practical	Credit
FLE 10	PROFESSIONAL ENGLISH I	6	0	3

Course Outcomes

CO1 - Recognize their own ability in using the language for speaking with confidence in an intelligible and acceptable manner

CO 2 - Understand the importance of reading for life

CO 3 - Read independently unfamiliar texts with comprehension

CO 4 - Understand the importance of writing in academic life

Write simple sentences without committing error of spelling or grammar

Course Objectives

To develop the language skills of students by offering adequate practice in professional contexts.

To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students

To focus on developing students' knowledge of domain specific registers and the required language skills.

To develop strategic competence that will help in efficient communication

To sharpen students' critical thinking skills and make students culturally aware of the target situation.

UNIT 1:

COMMUNICATION

Listening: Listening to audio text and answering questions - Listening to Instructions Speaking: Pair work and small group work. Reading: Comprehension passages –Differentiate between facts and opinion Writing: Developing a story with pictures. Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 2: DESCRIPTION

Listening: Listening to process description. -Drawing a flow chart. Speaking: Role play (formal context) Reading: Skimming/Scanning- Reading passages on products, equipment and gadgets. Writing: Process Description –Compare and Contrast Paragraph-Sentence Definition and Extended definition- Free Writing. Vocabulary: Register specific -Incorporated into the LSRW tasks.

UNIT 3: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields (Subject specific) Speaking: Brainstorming. (Mind mapping). Small group discussions (Subject- Specific) Reading: Longer Reading text. Writing: Essay Writing (250 words) Vocabulary: Register specific - Incorporated into the LSRW tasks.

UNIT 4: PRESENTATION SKILLS

Listening: Listening to lectures. Speaking: Short talks. Reading: Reading Comprehension passages Writing: Writing Recommendations Interpreting Visuals inputs Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 5: CRITICAL THINKING SKILLS

Listening: Listening comprehension- Listening for information. Speaking: Making presentations (with PPT- practice). Reading: Comprehension passages –Note making. Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills) Writing: Problem and Solution essay– Creative writing –Summary writing Vocabulary: Register specific - Incorporated into the LSRW tasks

SEM I	CORE THEORY	**Lecture**	**Practical**	**Credit**
FCS11	**PROGRAMMING IN C**	**6**	**0**	**4**

OBJECTIVES:

1. To understand simple algorithms,
2. To understand language constructs
3. To understand and develop programming skills in C.
4. To understand the basic concepts of decision making and looping statements.
5. To understand the concepts of arrays, structures, union, pointers and files.

Course Outcomes:

1. The Student will be able to understand the concepts of Constants, Variables, and Data
2. Types, Operators and Expressions
3. The Student will be able to understand the concepts of Managing Input and Output
4. Operations, Decision Making and Branching, Decision Making and Looping.
5. The Student will be able to understand the concepts of Arrays, Character Arrays and
6. Strings, User Defined Functions.
7. The Student will be able to understand the concepts of Structure and Unions, Pointers,
8. File Management in C.
9. The Student will be able to understand the concepts of Fundamental Algorithms,
10. Factoring Methods.

UNIT – I

Overview of C: History – Importance – Sample Programs – Basic Structure – Programming Style – Executing – Unix System – MS-DOS System - Constants, Variables, and Data Types: Character Set – C Token – Keyword and Identifiers – Constants – Variables – Data Types – Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaration – Overflow and Underflow of Data - Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic Expressions, Evaluation of Expressions – Precedence of Arithmetic Operators – Some Computational Problems – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical Functions .

UNIT – II

Managing Input and Output Operations: Reading, Writing a Character – Formatted Input, Output - Decision Making and Branching: Decision Making with If statement – Simple If Statement – The If…Else Statement – Nesting of If…Else Statements – The Else If Ladder – The Switch Statement- The ?: Operator – The Goto Statement - Decision Making and Looping: The while Statement – The do Statement – The for Statement – Jumps in Loops – Concise Test Expressions.

UNIT – III

Arrays: One-Dimensional Arrays - Declaration, Initialization of One-Dimensional Arrays – Two-

Dimensional Arrays - Initializing Two-Dimensional Arrays – Multi-Dimensional Arrays – Dynamic Arrays - Character Arrays and Strings: Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – Arithmetic Operations on Characters – Putting String Together – Comparison of Two Strings –String Handling Functions – Table of Strings – Other Features of Strings - User Defined Functions:
Need for User-Defined Functions – A Multi-Function Program – Elements of User-Defined Functions – Definition of Functions – Return Values and Their Types – Function Calls – Function Declaration – Category of Functions – No Arguments and No Return Values – Arguments but no return values – Arguments with Return Values – No Arguments but Returns a value – Functions that Return Multiple Values – Nesting of Functions – Recursion – Passing Arrays, Strings to Functions – The Scope, Visibility and Lifetime of Variables – Multi file Programs.

UNIT – IV

Structure and Unions: Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization and Copying and Comparing Structure Variable – Operations on Individual Members – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions – Size of Structures – Bit Fields Pointers: Understanding Pointers – Accessing the Address of Variable – Declaring, Initialization of Pointer Variables – Accessing a Variable through its pointer – Chain of Pointers – Pointer Expression – Pointer Increments and Scale Factor – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments – Functions Returning Pointers – Pointers to Functions – Pointers and Structures – Troubles with Pointers File Management in C: Defining and Opening a File – Closing a File –Input/output Operations on File – Error Handling During I/O Operations – Random Access to Files – Command Line Arguments.

UNIT – V

Fundamental Algorithms: Exchanging the values of Two Variables- Counting- Summation of a Set of Numbers-Factorial Computation -Sine Function Computation – Generation of the Fibonacci Sequence-Reversing the Digits of an Integer- Base Conversion – Character to Number Conversion - Factoring Methods: Finding the square Root of a Number –The Smallest Divisor of an Integer-The Greatest Common Divisor of the two integers-Generating Prime Numbers- Computing the Prime Factors of an integer –Generation of Pseudo-random Numbers-Raising a Number to a Large Power-Computing the nth Fibonacci Number
(Chapters: 2 & 3)

TEXT BOOK:

1. Programming in ANSI C, E. Balagurusamy, Tata McGraw hill Education, 6th Edition, 2013. (Unit I to IV)
2. How to Solve it by Computer, R.G.Dromey, PHI International (Unit V)

REFERENCE BOOKS:

1. The C Programming Language (ANSI C), Kernighan, B.W. and Ritchie, D.M., PHI.
2. C by Discovery, Foster & Foster, Penram International Publishers, Mumbai.

E - REFERENCES

1. NPTEL, Introduction to C Programming, Prof.Satyadev Nandakumar ,IIT, Computer Science and Engineering Kanpur.
2. NPTEL, Introduction to Problem Solving & Programming, by Prof. Deepak Gupta Department of Computer Science and Engineering IIT Kanpur.

SEM I	ALLIED I	Lecture	Practical	Credit
FAMA15B	MATHEMATICAL FOUNDATIONS I	7	0	3

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

Course Outcomes

1. After completion of unit 1 student can able to understand about symbolic and logical operators
2. After completion of unit 2 student can able to understand about Set Theory
3. After completion of unit 3 students are able to understand about Binary Operations.
4. After completion of unit 4 student can able to understand about Differentiation
5. After completion of unit 5 student can able to understand about Two dimensional analytical geometry

Syllabus:

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contrapositive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, Venn diagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions, Relations: Equivalence relation. Equivalence class, Partially and Totally Ordered sets, Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

$$\lim_{x \to a} \frac{x^n - a^n}{x - a}, \quad \lim_{x \to 0} \frac{\sin x}{x}, \quad \lim_{x \to 0} \frac{\tan x}{x}, \quad \lim_{x \to 0} \frac{e^x - 1}{x}, \quad \lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n, \quad \lim_{n \to 0} (1+n)^{1/n}$$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Margham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Discrete Mathematical Foundation - A.P.Publication, sirkali.
3. P.Duraipandian & Others, Analytical Geometry 2 Dimension – Emerald publication 1992 Reprint.
4. Manicavachagompillay & Natarajan. Analytical Geometry part I – Two Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEM I	CORE PRACTICAL	Lecture	Practical	Credit
FPCS13	**C PROGRAMMING LAB**	**0**	**3**	**2**

Objectives:

1. To understand concepts of for/while loop and switch.
2. To understand language Functions and recursions.
3. To understand and develop String Manipulations.
4. To understand the basic concepts of searching and sorting.
5. To understand the concepts of structures.

Outcomes:

CO1 - Enhance the analyzing and problem solving skills and use the same for writing programs in C.

CO2 - Write diversified solutions, draw flowcharts and develop a well-documented and indented
program according to coding standards.

CO3 - Learn to debug a given program and execute the C program.

CO4 - To have enough practice the use of conditional and looping statements.

CO5 - To implement arrays, functions and pointers.

Control Statements:

1. Print n Fibonacci numbers – (using for)
2. Print n Prime numbers – (using while)
3. Simple arithmetic on two numbers – (using switch/case)

Functions:

4. Swap two values using call by value / call by reference.

Recursion:

5. To compute NcR and NpR
6. To Compute GCD and LCM

String Manipulation.

7. Operations on string such as length, concatenation, reverse, counting, and copy of a string to another.

Matrices:

8. Matrix Addition, Subtraction, Multiplication, Transpose of n x m matrices.
9. Inverse of a square matrix

Searching:

10. Binary Search.

Sorting:

11. Bubble Sort
12. Insertion Sort

Structures:

13. Students Mark statement

Pointers:

14. Arithmetic operations on pointers.

Files

15. Creating/ Reading/ Writing a text/binary file.

REFERENCE BOOK:

SEM I	ENVIRONMENTAL STUDIES	Lecture	Practical	Credit
FES10	**ENVIRONMENTAL STUDIES**	**2**	**0**	**2**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Explain the various natural resources and the impact of man-made fertilizers on the environment.
2. Describe the Ecosystem, Biodiversity and its Conservation.
3. Explain the Environmental Pollution and Management
4. Analyze the Social Issues concerning Human Population such as Environmental ethics, health and the role of IT on the environment and human health
5. Study a simple local ecosystem and prepare a FIELD WORK Report.

SYLLABUS

UNIT-I:

INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES:

Environmental Sciences - Relevance - Significance - Public awareness – Forest resources – Water resources

Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT-II:

ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem. Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - In Situ & Ex Situ.

UNIT-III:

ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earthquake, Cyclone and Landslides. Role of individuals in prevention of pollution - pollution case studies.

UNIT-IV:

SOCIAL ISSUES - HUMAN POPULATION

Urban issues - Energy - water conservation - Environmental Ethics - Global warming -Resettlement and Rehabilitation issues - Environmental legislations – Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act – Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

UNIT-V:

FIELD WORK

Visit to a local area / local polluted site / local simple ecosystem - Report submission

REFERENCES

1. Kumarasamy, K., A.Alagappa Moses and M.Vasanthy, 2004. Environmental Studies, Bharathidsan University Pub, 1, Trichy
2. Rajamannar, 2004, Environemntal Studies, EVR College Pub, Trichy
3. Kalavathy,S. (ed.) 2004, Environmental Studies, Bishop Heber College Pub., Trichy.

SEM II	LANGUAGE	Lecture	Practical	Credit
FLT20	TAMIL II	6	0	4

Nehf;fk;

1. khzth;fs; tho;f;ifapy; mwnewpAld; tho;tjw;Fk; kdijxUKfgLj;Jtjw;Fk; gf;jp ,yf;fpaq;fSk; rpw;wpyf;fpaq;fSk; khzth;fSf;Fgad;gLfpwJ.
2. gf;jp ,yf;fpaj;jpd; thapyhfGuhzq;fspd; Kf;fpaj;Jtj;ijAk; nja;tq;fspd; ngUikfisAk; khzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.
3. flTsh;fisAk; murh;fisAk; Nguhpyf;fpaq;fs; Ngrpafhyq;fspy; rpw;wpyf;fpaq;fs; vspakf;fspd; tho;f;ifKiwiagw;wpNgRfpwJvd;gijkhzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.
4. khzth;fs; tho;f;ifapy; mwk;>xOf;fk; rhh;e;jnray;ghLfspy; jq;fis ,izj;Jf;nfhs;tjw;Fgf;jpkhh;f;fk; Jizg; Ghpfpd;wj.
5. khzth;fs; ehad;khh;fisfw;gjpdhy; rptDilangUikfismwpe;Jf;nfhs;fpd;wdh;.
6. khzth;fs; Mo;thh;fisgbg;gjdhy; jpUkhy; ngUikfisnjhpe;Jf;nfhs;fpd;wdh;.
7. khzth;fs; rpw;wpyf;fpaq;fisthrpg;gjpdhy; 96 tifahdrpw;wpyf;fpaq;fisg; gw;wpGhpe;Jf;nfhs;fpd;wdh;.
8. nkhopj;jpwd; gapw;rpngWtjpd; thapyhfkhzth;fs; nghJf;fl;Liufs; vOJtjw;Fg; gapw;rpg;ngWfpwhh;fs;
   myF – 1 ftpij

   1. jpUehTf;furh; - jpUtjpif gjpfk;
   ($w;whapdthW tpsf;fsPh; -
   Kjy; 5 ghly;fs;)
   2. khzpf;fthrfh; - mr;Nrhgjpfk;
   (Kf;jp newpNa mwpahj –
   Kjy; 5 ghly;fs;)
   3. jpU%yh; - fy;tp
   (Kjy; 5 ghly;fs;)
   myF -2
   1. Mz;lhs; - ehr;rpahh; jpUnkhop
   (fw;G+uk; ehWNkh – vdj; njhlq;Fk;
   5 ghly;fs; kl;Lk;)
   2. FyNrfuho;thh; - ngUkhs; jpUnkhop (4-Mk; jpUnkhop)
   3. ek;kho;thh; - cah;tu cah;eyk; cilatd;
   (vdj; njhlq;Fk; 5 ghly;fs;)
   myF -3
   1. gygl;lil nrhf;fehjg;Gyth; - mofh; fps;is tpL J}J
   2. n[aq;nfhz;lhh; - fypq;fj;Jg;guzp (filj;jpwg;G)
   3. Kf;$lw;gs;S - Vry;
   myF -4
   1. fz;zjhrd; - VRfhtpak; (Cjhhpg;gps;is)
   2. Fzq;Fb k];jhd; rhfpG - k];jhd; rhfpG ghly;fs;
   guh guf;fz;zp (1-40 fz;zpfs;)
   3. gl;bdj;jhh; ghly;fs; - jpUtpil kUJ}h;
   (fhNl jphpe;J – vdj; njhlq;Fk; ghly;

gh.vz;.279> 280)
myF -5
1. Neh;fhzy;
2. ehspjOf;F mwpf;ifj; jahupj;jy;
3. ghlg;gFjpiaxl;ba ,yf;fpa tuyhW
irt> itzt rka ,yf;fpaq;fs;> fpwp];JtKk; jkpOk;> ,];yhkpaKk; jkpOk;.

SEM II	GENERAL ENGLISH	Lecture	Practical	Credit
FLE20	COMMUNICATIVE ENGLISH II	6	0	4

Course Outcome

CO 1 – The students get to learn more about various ways of using LSRW
CO 2 – Able to understand the proper usage of a language
CO 3 – Will build up interpersonal communication by reinforcing basic of pronunciation
CO 4 – Improve conversational skills
CO 5 – Enable to familiar with the sounds of the English vocabulary, grammer

Course objective

1. Enhance and improve the learner's communication skills by given adequate exposure in LSRW listening, speaking, reading and writing skills and the related sub – skills with study skills and basics of grammar.
2. Comprehend how to discover self and others, the vital role of listening and its challenges.
3. Become fluent in reading aloud, able to understand texts and to as and answer questions, interpret diagrammatic information, develop the summarizing, paraphrasing and writing skills.
4. Explore glossary through research tools- online, e-learning, digital resources.

SYLLABUS

Unit I (18 hours)

1. Listening and Speaking
a. Listening and responding to complaints (formal situation)
b. Listening to problems and offering solutions (informal)
2. Reading and writing
a. Reading aloud (brief motivational anecdotes)
b. Writing a paragraph on a proverbial expression/motivational idea.
3. Word Power/Vocabulary
a. Synonyms & Antonyms
4. Grammar in Context
Adverbs Prepositions

Unit II (20 hours)

1. Listening and Speaking
a. Listening to famous speeches and poems
b. Making short speeches- Formal: welcome speech and vote of thanks.
Informal occasions- Farewell party, graduation speech
2. Reading and Writing
a. Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic)
b. Reading poetry
b.i. Reading aloud: (Intonation and Voice Modulation)
b.ii. Identifying and using figures of speech - simile, metaphor, personification etc.

3. Word Power
a. Idioms & Phrases
4. Grammar in Context Conjunctions and Interjection.

Unit III (18 hours)
1. Listening and Speaking
a. Listening to Ted talks
b. Making short presentations – Formal presentation with PPT, analytical presentation of graphs and reports of multiple kinds
c. Interactions during and after the presentations
2. Reading and writing
a. Writing emails of complaint
b. Reading aloud famous speeches
3. Word Power
a. One Word Substitution
4. Grammar in Context:
Sentence Patterns

Unit IV (16 hours)
1. Listening and Speaking
a. Participating in a meeting: face to face and online
b. Listening with courtesy and adding ideas and giving opinions during the meeting and making concluding remarks.
2. Reading and Writing
a. Reading visual texts – advertisements
b. Preparing first drafts of short assignments
3. Word Power
a. Denotation and Connotation
4. Grammar in Context:
Sentence Types

Unit V (18 hours)
1. Listening and Speaking
a. Informal interview for feature writing
b. Listening and responding to questions at a formal interview
2. Reading and Writing
a. Writing letters of application
b. Readers' Theatre (Script Reading)
c. Dramatizing everyday situations/social issues through skits. (writing scripts and performing)
3. Word Power
a. Collocation
4. Grammar in Context:
Working with Clauses

SEM II	GENERAL ENGLISH	Lecture	Practical	Credit
FPE20C	**PROFESSIONAL ENGLISH II**	**6**	**0**	**3**

Course Outcomes

CO1 - Recognize their own ability in using the language for speaking with confidence in an intelligible and acceptable manner
CO 2 - Understand the importance of reading for life
CO 3 - Read independently unfamiliar texts with comprehension
CO 4 - Understand the importance of writing in academic life
Write simple sentences without committing error of spelling or grammar

Course Objectives

To develop the language skills of students by offering adequate practice in professional contexts.
To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
To focus on developing students' knowledge of domain specific registers and the required language skills.
To develop strategic competence that will help in efficient communication
To sharpen students' critical thinking skills and make students culturally aware of the target situation.

Syllabus

UNIT 1: COMMUNICATION

"1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)
5. Writing: Letters and Emails in professional context
6. Grammar in Context:
 Wh and yes or no,
 Q tags
 Imperatives
7, Vocabulary in Context: Word formation - .
i) Creating antonyms using Prefixes
ii) Intensifying prefixes (E. g inflammable)
Changing words using suffixes
A) Noun Endings
B) Adjective Endings
C) Verb Endings "

UNIT 2: DESCRIPTION

"Listening – Listening to process description
Speaking - Role play
Formal: With faculty and mentors in academic environment, workplace communication
Informal: With peers in academic environment, workplace communication

Reading –Reading passages on products, equipment and gadgets
Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)
Picture Description – Description of Natural Phenomena
Grammar in Context: Connectives and linkers.
Vocabulary – Synonyms (register) - Compare & contrast expressions.
+"

UNIT 3: NEGOTIATION STRATEGIES

"Listening - Listening to interviews of specialists / inventors in fields (Subject specific)
Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)
Reading – longer Reading text. (Comprehensive passages)
Writing – Essay Writing (250 words essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)
Grammar in Context: Active voice & Passive voice – If conditional -
Collocations –Phrasal verbs "

UNIT 4: PRESENTATION SKILLS

"Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)
Speaking –Short speech
- Making formal presentations (PPT)
Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.
Writing - Writing Recommendations
Interpreting visuals - charts / tables/flow diagrams/charts
Grammar in Context – Modals
Vocabulary (register) - Single word substitution "

UNIT 5: CRITICAL THINKING SKILLS

"Listening - Listening to advertisements/news and brief documentary films (with subtitles)
Speaking – Simple problems and suggesting solutions.
Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)
Writing Studying problem and finding solutions- (Essay in 200 words)
Grammar-Make simple sentences
Vocabulary -Fixed expressions"

Text Book

NIL

References

NIL

SEM II	CORE THEORY	Lecture	Practical	Credit
FCS21	C++ AND DATA STRUCTURES	5	0	6

Objectives:

1. To understand the concepts of object-oriented programming and master OOP using C++.
2. To understand the concepts of Inheritance, polymorphism and templates.
3. To understand the concepts of different view of data, stack and queues.
4. To understand the concepts of Programming with Recursion, Binary Search Tree and graphs.
5. To understand the concepts of Sorting and Searching Algorithms.

Course Outcomes:

- The Student will be able to understand the concepts of object oriented programming, apply structure and inline functions.
- The Student will be able to understand the concepts of the types of inheritances and applying various levels of Inheritance for real time problems
- Apply the OOPs concepts class and object. Understand Explain the file concept and exception handlings in C++
- The Student will be able to understand the concepts of Stacks and Queue using array and pointers.
- The Student will be able to understand the concepts of Recursion, Binary Search Tree and graphs.
- The Student will be able to understand the concepts of Sorting and Searching Algorithms.

UNIT-I:

Principles of Object Oriented Programming – Beginning with C++ – Token, Expressions and Control Structures- Functions in C++ – Classes and Objects – Constructors and Destructors.

UNIT-II:

Operator Overloading and Type Conversions – Inheritance: Extending Classes – Pointers, Virtual Functions and Polymorphism - Managing Console I/O Operations. Working with Files - Templates – Exception Handling – Manipulating Strings.

UNIT-III:

Data Design & implementations: Different views of data – Abstraction and Built-in Types – Arrays ADTs Stacks and Queue (Linear and Linked), Stack (Array and Pointer)- Applications- Infix to Postfix Conversions – Queue(Array and Pointer) – List(Array and Pointer) – Applications: (Polynomial Addition) - Doubly Linked Lists.

UNIT – IV:

Programming with Recursion: Recursion – Verifying and Writing Recursive Functions – Binary Search Tree: Implementation – Tree Traversal – Graphs: Implementations – BFS – DFS – Dijkstra's Shortest Path Algorithm. (Chapter 7: Section 7.1,7.4 7.5, Chapter 8: Section 8.1,8.4, Chapter 9: Section 9.3)

UNIT-V:

Sorting and Searching Algorithms: Sorting – Searching – Hashing (Chapter 10: Section 10.1, 10.2, 10.3)

TEXT BOOK:

1. Object Oriented Programming with C++, E Balagurusamy, Tata McGraw Hill, 6th Edition, 2014. (Units I, II)
2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers, 4th Edition, 2010. (Units III, VI & V)

REFERENCES:

1. C++ The Complete Reference, Herbert Schildt, Tata McGraw Hill, 4th Edition, 2003.
2. OOP In ANSI C and Turbo C, Ashok N.Kamthene, Pearson Education, 6th Edition, 2008.
3. Data Structures and Algorithms, Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, Addison Wesley Longman Inc., 2nd Edition, 1999.

SEM II	CORE PRACTICAL	**Lecture**	**Practical**	**Credit**
FPCS26	**C++ AND DATA STRUCTURES LAB**	**0**	**3**	**2**

Objectives:

1. To develop C++ programming skills in design
2. To understand the basic concepts of different abstract types and structure of data.
3. To understand the concepts of Function Overloading
4. To understand the concepts of Stack, Queue, List, Doubly Linked List - using Pointers using Arrays.
5. To understand the concepts of Searching and Sorting Algorithms.

Course Outcomes:

- Understand the Creating and Deleting the Objects with the Concepts of Constructors and Destructors.
- Demonstrate the Polymorphism Concepts and Operator Overloading.
- Understand basic Data Structures such as Arrays, Linked Lists, Stacks, Queues, Doubly Linked List and Infix to Postfix Conversion.
- Apply Algorithms for solving problems like Sorting and Searching.
- Apply Algorithms and use Graphs and Trees as tools to visualize and simplify Problems

LIST OF LAB EXERCISES

1. Constructors & Destructors, Copy Constructor.
2. Friend Function & Friend Class.
3. Inheritance.
4. Polymorphism & Function Overloading.
5. Virtual Functions.
6. Overload Unary & Binary Operators Both as Member Function & Non Member Function.
7. Class Templates & Function Templates.
8. Exception Handling Mechanism.
9. Standard Template Library concept.
10. File Stream Classes.
11. Array implementation of Stack, Queue: Infix to postfix
12. Implementation of Stack, Queue, List, Doubly Linked List - using Pointers- Polynomial Addition
13. Implementation of Binary Search Tree, Traversal.
14. Implementation of Searching and Sorting Algorithms.
15. Graph Implementation of shortest path (Djikstras)

REFERENCE:

1. Object Oriented Programming with C++, E Balagurusamy, Tata McGraw Hill, 6th Edition, 2014.
2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers, 4th Edition, 2010.

SEM II	ALLIED I	Lecture	Practical	Credit
FAMA25B	MATHEMATICAL FOUNDATIONS II	7	0	5

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

Course Outcomes

1. After completion of unit 1 the student can able to understand the basic concept of Matrices.
2. After completion of unit 2 the student can able to understand the basic concept of Matrices
3. After completion of unit 3 the student can able to understand the basic concept of Integration
4. After completion of unit 4 the student can able to understand the basic properties of definite integrals
5. After completion of unit 5 the student can able to understand the basic concept of analytical geometry of three dimension

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermitian, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

(i) Cramer's rule.

(ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method),characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

$$\frac{1}{\sqrt{ax^2+bx+c}}, \frac{1}{\sqrt{ax^2+bx+c}}, \frac{px+q}{\sqrt{ax^2+bx+c}}, \frac{px+q}{ax^2+bx+c}, \frac{px+q}{\sqrt{ax^2+bx+c}}$$

integrations using simple substitutions integrations involving trigonometric functions of the form

$$\frac{1}{a+b\cos x}, \frac{1}{a^2\sin^2 x+b^2\cos^2 x}$$

Integration by parts.

UNIT-IV

Properties of definite integrals. Reduction formulae for

$x^n e^{ax}dx$, $\sin^n x\,dx$, $\cos^n x\,dx$, $x^m(1-x)^n dx$, applications of integration for (i) Area under plane curves, (ii) Volume of solid of revolution.

UNIT-V:

ANALYTICAL GEOMETRY OF THREE

DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Discrete Mathematical Foundation - A.P.Publication, sirkali.
3. P. Duraipandian & Others, Analytical Geometry 3 Dimension – Emerald publication 1992 Reprint.
4. Manicavachagompillay & Natarajan. Analytical Geometry part II – three Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEM II	VALUE EDUCATION	**Lecture**	**Practical**	**Credit**
FGA20	**VALUE EDUCATION**	**2**	**0**	**2**

LEARNING OBJECTIVES

To know the values of human, social, local and global life in the context of one's own setting.

After completing this course, the students will be able to

1. Appreciate human values and gain self-esteem
2. Realize the importance of family and its members particularly women in the society
3. Interpret the ethical values in the context of profession, media, family and personal life.
4. Recognize the values of the society and its impact
5. Formulate the ethical system at the international level and modern trends.

SYLLABUS

UNIT 1 - Value Education - Definition - relevance to present day - Concept of Human Values – self introspection - Self-esteem.

UNIT 2 - Family values - Components, structure and responsibilities of family – Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT 3 - Ethical values - Professional ethics - Mass media ethics - Advertising ethics – Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT 4 - Social values - Faith, service and secularism - Social sense and commitment – Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities Redressal mechanisms.

UNIT 5 - Effect of international affairs on values of life/ Issue of Globalization – Modern warfare Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

REFERENCES

1. T. Anchukandam and J. Kuttainimathathil (Ed), "**Grow Free Live Free**", Kristu Jyoti Publications, Bangalore (1995)
2. Mani Jacob (Ed), "**Resource Book for Value Education**", Institute for Value Education, New Delhi 2002.
3. DNBI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
4. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
5. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.
6. M.M.M.Mascarenhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993

SEM II	SOFT SKILLS	Lecture	Practical	Credit
FSS20	**SOFT SKILLS**	**2**	**0**	**1**

LEARNING OBJECTIVES

After completing this course, the students will be able to

1. Demonstrate the skills for listening, writing, reading and writing
2. Read and respond to instruction
3. Seek and respond to information in day to day life
4. Correct grammatical and spelling errors
5. Actively engage in formal, in-formal and non-verbal communication

SYLLABUS

UNIT 1 - 1.1. Skills in Listening and Writing 1.2. Skills in Reading and Understanding

UNIT 2 - 2.1. Skills to Read and Respond to Instructions 2.2. Skills of Interpretation and Transcoding Information

UNIT 3 - 3.1. Skills in Seeking and Responding to Information 3.2. Skills of Day-to-Day communication

UNIT 4 - 4.1. Grammatical skills and Spelling rules 4.2. Career skills

UNIT 5 - 5.1. Skills of formal and in-formal rules 5.2. Skills of non-verbal communication

REFERENCES

NIL

SEM III	LANGUAGE	Lecture	Practical	Credit
FLT30	**TAMIL III**	**6**	**0**	**4**

Nehf;fk;

1. khzth;fs; tho;f;ifapy; mwnewpAld; tho;tjw;Fk; kdijxUKfgLj;Jtjw;Fk; gf;jp ,yf;fpaq;fSk; rpw;wpyf;fpaq;fSk; khzth;fSf;Fgad;gLfpwJ.
2. gf;jp ,yf;fpaj;jpd; thapyhfGuhzq;fspd; Kf;fpaj;Jtj;ijAk; nja;tq;fspd; ngUikfisAk; khzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.
3. flTsh;fisAk; murh;fisAk; Nguhpyf;fpaq;fs; Ngrpafhyq;fspy; rpw;wpyf;fpaq;fs; vspakf;fspd; tho;f;ifKiwiagw;wpNgRfpwJvd;gijkhzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.
4. khzth;fs; tho;f;ifapy; mwk;>xOf;fk; rhh;e;jnray;ghLfspy; jq;fis ,izj;Jf;nfhs;tjw;Fgf;jpkhh;f;fk; Jizg; Ghpfpd;wj.
5. khzth;fs; ehad;khh;fisfw;gjpdhy; rptDilangUikfismwpe;Jf;nfhs;fpd;wdh;.
6. khzth;fs; Mo;thh;fisgbg;gjdhy; jpUkhy; ngUikfisnjhpe;Jf;nfhs;fpd;wdh;.
7. khzth;fs; rpw;wpyf;fpaq;fisthrpg;gjpdhy; 96 tifahdrpw;wpyf;fpaq;fisg; gw;wpGhpe;Jf;nfhs;fpd;wdh;.
8. nkhopj;jpwd; gapw;rpngWtjpd; thapyhfkhzth;fs; nghJf;fl;Liufs; vOJtjw;Fg; gapw;rpg;ngWfpwhh;fs;
myF – 1 ftpij

1. jpUehTf;furh; - jpUtjpif gjpfk;
($w;whapdthW tpsf;fsPh; -
Kjy; 5 ghly;fs;)
2. khzpf;fthrfh; - mr;Nrhgjpfk;
(Kf;jp newpNa mwpahj –
Kjy; 5 ghly;fs;)
3. jpU%yh; - fy;tp
(Kjy; 5 ghly;fs;)
myF -2
1. Mz;lhs; - ehr;rpahh; jpUnkhop
(fw;G+uk; ehWNkh – vdj; njhlq;Fk;
5 ghly;fs; kl;Lk;)
2. FyNrfuho;thh; - ngUkhs; jpUnkhop (4-Mk; jpUnkhop)
3. ek;kho;thh; - cah;tu cah;eyk; cilatd;
(vdj; njhlq;Fk; 5 ghly;fs;)
myF -3
1. gygl;lil nrhf;fehjg;Gyth; - mofh; fps;is tpL J}J
2. n[aq;nfhz;lhh; - fypq;fj;Jg;guzp (filj;jpwg;G)
3. Kf;$lw;gs;S - Vry;
myF -4
1. fz;zjhrd; - VRfhtpak; (Cjhhpg;gps;is)
2. Fzq;Fb k];jhd; rhfpG - k];jhd; rhfpG ghly;fs;
guh guf;fz;zp (1-40 fz;zpfs;)
3. gl;bdj;jhh; ghly;fs; - jpUtpil kUJ}h;
(fhNl jphpe;J – vdj; njhlq;Fk; ghly;
gh.vz;.279> 280)
myF -5
1. Neh;fhzy;

2. ehspjOf;F mwpf;ifj; jahupj;jy;
3. ghlg;gFjpiaxl;ba ,yf;fpa tuyhW
irt> itzt rka ,yf;fpaq;fs;> fpwp];JtKk; jkpOk;> ,];yhkpaKk; jkpOk;.

SEM III	GENERAL ENGLISH	**Lecture**	**Practical**	**Credit**
FPE30	**ENGLISH III**	**6**	**0**	**3**

Course Outcomes

CO1 - Recognize their own ability in using the language for speaking with confidence in an intelligible and acceptable manner
CO 2 - Understand the importance of reading for life
CO 3 - Read independently unfamiliar texts with comprehension
CO 4 - Understand the importance of writing in academic life
Write simple sentences without committing error of spelling or grammar

Course Objectives

To develop the language skills of students by offering adequate practice in professional contexts. To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
To focus on developing students' knowledge of domain specific registers and the required language skills.
To develop strategic competence that will help in efficient communication
To sharpen students' critical thinking skills and make students culturally aware of the target situation.

Syllabus

UNIT 1: COMMUNICATION

"1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)
5. Writing: Letters and Emails in professional context
6. Grammar in Context:
 Wh and yes or no,
 Q tags
 Imperatives
7, Vocabulary in Context: Word formation - .
i) Creating antonyms using Prefixes
ii) Intensifying prefixes (E. g inflammable)
Changing words using suffixes
A) Noun Endings
B) Adjective Endings
C) Verb Endings "

UNIT 2: DESCRIPTION

"Listening – Listening to process description
Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication
Informal: With peers in academic environment, workplace communication
Reading –Reading passages on products, equipment and gadgets
Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)
Picture Description – Description of Natural Phenomena
Grammar in Context: Connectives and linkers.
Vocabulary – Synonyms (register) - Compare & contrast expressions.
+"

UNIT 3: NEGOTIATION STRATEGIES

"Listening - Listening to interviews of specialists / inventors in fields (Subject specific)
Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)
Reading – longer Reading text. (Comprehensive passages)
Writing – Essay Writing (250 words essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)
Grammar in Context: Active voice & Passive voice – If conditional -
Collocations –Phrasal verbs "

UNIT 4: PRESENTATION SKILLS

"Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)
Speaking –Short speech
- Making formal presentations (PPT)
Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.
Writing - Writing Recommendations
Interpreting visuals - charts / tables/flow diagrams/charts
Grammar in Context – Modals
Vocabulary (register) - Single word substitution "

UNIT 5: CRITICAL THINKING SKILLS

"Listening - Listening to advertisements/news and brief documentary films (with subtitles)
Speaking – Simple problems and suggesting solutions.
Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)
Writing Studying problem and finding solutions- (Essay in 200 words)
Grammar-Make simple sentences
Vocabulary -Fixed expressions"

Text Book

NIL

References

NIL

SEM III	ALLIED I	Lecture	Practical	Credit
FAMA32	MATHEMATICAL FOUNDATIONS II	7	0	5

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

Course Outcomes

1. After completion of unit 1 the student can able to understand the basic concept of Matrices.
2. After completion of unit 2 the student can able to understand the basic concept of Matrices
3. After completion of unit 3 the student can able to understand the basic concept of Integration
4. After completion of unit 4 the student can able to understand the basic properties of definite integrals
5. After completion of unit 5 the student can able to understand the basic concept of analytical geometry of three dimension

Unit-1: **TeachingHours:11Hrs.**

Introduction - scope and limitations of statistical methods - classification of data -Tabulation of data- Diagrammatic and Graphical representation of data - Graphical determination ofQuartiles ,Deciles andPercentiles.

Unit-2: **TeachingHours: 10Hrs.**

Measuresoflocation:Arithmeticmean,median,mode,geometricmeanandHarmonicmeanandtheirpropert ies.

Unit-3: **TeachingHours: 10Hrs.**

Measuresofdispersion:Range,Quartiledeviation,meandeviation,Standarddeviation,combinedStandardde viati on,andtheirrelativemeasures.

Unit-4: **TeachingHours:10Hrs.**

Measures of Skewness: Karl Pearson's, Bowley's, and kelly's and co-efficient ofSkewness and kurtosisbasedonmoments.

Unit-5: **TeachingHours: 11Hrs.**

Correlation - Karl Pearson - Spearman's Rank correlation - concurrent deviationmethods.RegressionAnalysis:SimpleRegressionEquations.
Note:Theproportionbetween theoryandproblemsshallbe20:80

LEARNING OBJECTIVES

- Knowing about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes

SEM III	CORE THEORY	**Lecture**	**Practical**	**Credit**
CCS31	**JAVA PROGRAMMING**	**5**	**0**	**4**

- Secured, well-suited for internet programming using applets and GUI-based

After completing this course, the students will be able to

1. Describe Object oriented programming concepts.
2. Write Java Programs using Arrays, Inheritance, Interface and Packages based on requirements.
3. Use String handling, exception handling and Multithreading concepts in Java programs
4. Create a simple application with the use of AWT controls and GUI Tools.
5. Develop a JDBC enabled Java Application.

Course Outcomes:

- Students are able to know about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes
- Students are able to Secured, well-suited for internet programming using applets and GUI-based

SYLLABUS

UNIT I

Declarations and Access Control: Identifiers and Keywords: Oracle‘s Java Code Conventions. Define Classes: Import Statements and the Java API - Static Import Statements. Use Interfaces: Declaring an Interface-Declaring Interface Constants. Declare Class Members: Access Modifiers - Non access Member Modifiers - Constructor Declarations - Variable Declarations. Declare and Use enums: Declaring enums. Object Orientation: Encapsulation - Inheritance and Polymorphism-Polymorphism - Overriding / Overloading: Overridden Methods -Overloaded Methods.

UNIT II

Object Orientation: Casting - Implementing an Interface - Legal Return Types: Return Type Declarations - Returning a Value. Constructors and Instantiation: Overloaded Constructors - Initialization Blocks. Statics: Static Variables and Methods. Assignments: Stack and Heap - Literals, Assignments, and Variables: Literal Values for All Primitive Types. Scope - Variable Initialization - Passing Variables into Methods: Passing Object Reference Variables - Passing Primitive Variables. Garbage Collection. Operators: Java Operators - Assignment Operators - Relational Operators - instanceof Comparison - Arithmetic Operators - Conditional Operator - Logical Operators.

UNIT III

Working with Strings, Arrays, and Array Lists: Using String and StringBuilder: The String Class - The StringBuilder Class - Important Methods in the StringBuilder Class. Using Arrays: Declaring an Array -Constructing an Array - Initializing an Array. Using ArrayList:ArrayList Methods in Action - Important Methods in the ArrayList Class. Flow Control and Exceptions: Using if and switch Statements -Creating Loops Constructs - Handling Exceptions - Catching an Exception Using try and catch - Using finally. String Processing, Data Formatting Resource Bundles: String, StringBuilder, and StringBuffer -Dates, Numbers, Currencies, and Locales.

UNIT IV

I/O and NIO: File Navigation and I/O: Creating Files Using the File Class - Using FileWriter and FileReader. File and Directory Attributes -DirectoryStream - Serialization. Generics and Collections: toString(), hashCode(), and equals(): The toString() Method - Generic Types -Generic Methods - Generic Declarations. Inner Classes: Method – Local. Inner Classes - Static Nested Classes - Threads: Defining, Instantiating, and Starting Threads - Thread States and Transitions - Synchronizing Code, Thread Problems - Thread Interaction. Concurrency: Concurrency with the java.util.concurrent Package - Apply Atomic Variables and Locks - Use java.util.concurrent Collections - Use Executors and ThreadPools.

UNIT V

Applets: Applet fundamentals - Applet class - Applet life cycle - Steps for developing an applet program - Passing values through parameters - Graphics in an applet - Event-handling. GUI Applications - Part 1: Graphical user interface - Creating windows - Dialog boxes - Layout managers - AWT component classes - Swing component classes. GUI Applications - Part 2: Event handling - Other AWT components - AWT graphics classes - Other swing controls.

TEXT BOOK(S):

1. Kathy Sierra, Bert Bates — OCA/OCP Java SE 7 Programmer I & II Study Guide, Oracle Press. (Unit I,II,III,IV).

2. Sagayaraj, Denis, Karthik and Gajalakshmi, 2018, Java Programming - For Core and Advanced Learners, University Press (India) Private Limited, Hyderabad.(Unit V).

REFERENCE BOOKS:

1. Hebert Schild, 2002, The Complete Reference Java2, [Fifth Edition]. Tata McGraw-Hill, New Delhi.

2. John Hubbard, R.2004. Programming with Java. [Second Edition]. Tata McGraw-Hill,New Delhi.

3. Debasish Jana. 2005. Java and Object-Oriented Programming Paradigm, [Second Printing]. Prentice-Hall of India, New Delhi.

4. Sagayaraj, Denis, Karthik and Gajalakshmi 2018, Java Programming for core and advanced Learners, University Press India Pvt. Ltd., Hyderabad.

SEM III	CORE PRACTICAL	Lecture	Practical	Credit
CPCS35	JAVA PROGRAMMING LAB	0	4	3

Course Objectives

1. To use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
2. To read and make elementary modifications to Java programs that solve real-world problems.
3. To be able to create an application using string concepts.
4. To be able to create a program using files in application.
5. To be able to create an Applet to create an application and identify and fix defects and common security issues in code.

Course Outcomes

1. CO1. After studying unit-1, the student will be able to know about the working of object-oriented concepts in java.
2. CO2. After studying unit-2, the student will be able to practically know about primitive data types and operators.
3. CO3. After studying unit-3, the student will be able to practically work with arrays, control structures and handling exceptions.
4. CO4. After studying unit-4, the student will be able to practically work with files and packages.
5. CO5. After studied unit-5, the student will be able to practically know about Applets and GUI concepts

SYLLABUS

1. Implementation of Classes and Objects
2. Implementation of Inheritance and Polymorphism
3. Implementation of Interface and Package concepts
4. Implementation of Flow, Border, Grid Layouts
5. Implementation of Tic-Tac Toe Application Using Applets
6. Implementation of Frames, Menus, Dialog
7. Implementation of Swing concepts
8. Implementation of Exception Handling
9. Implementation of Multi-Threading
10. Implementation of I/O Streams
11. Implementation of Java Networking concepts
12. Implementation of Java Servlets (Connecting Database)
13. Implementation of RMI
14. Implementation of Java Beans

REFERENCES

NIL

SEM III	CORE PRACTICAL	Lecture	Practical	Credit
CPCS35	JAVA PROGRAMMING LAB	0	4	3

Course Objectives

1. TounderstandthebasicsofNumber System.

2. Tounderstandtheconcept ofSimplification ofBoolean expressionsusingK-mapandarithmeticcircuits.

3. TounderstandtheconceptofCombinationalLogicCircuits

4. To understand the conceptofBasicStructureofComputers

5. TounderstandthebasicconceptsofInputOutputandMemoryOrganization

Course Outcomes

1. Afterstudiedunit-1,thestudentwillbeabletounderstandBooleanalgebraandbasicgates.

2. Afterstudiedunit-2,thestudentwillbeabletounderstandhowtosimplifyexpressionusingK-Map.

3. Afterstudiedunit-3,thestudentwillbeabletounderstandhowtobuildcombinationalcircuits.

4. Afterstudiedunit-4,thestudentwillbeabletoknowaboutregistersandaddressingmodes

5. Afterstudiedunit-5,thestudentwillbeabletounderstandtypesofmemories.

MatchingTable

Unit	i.Remembering	ii.Understanding	iii.Applying	iv.Analyzing	v.Evaluating	vi.Creating
1	No	No	No	No	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

Unit-1:BINARY NUMBERSYSTEM **TeachingHours:8Hrs.**

Number system and its conversions-. Digital Computers and Digital Systems - BinaryNumberSystem – Binary Addition – Binary Subtraction- Binary Multiplication and Division-Number BaseConversion: decimal, binary, octal, hexadecimal. The Basic Gates - Boolean Algebra
- UniversalGates -BooleanLaws andTheorem.

Unit-2:SIMPLIFICATION **TeachingHours:8Hrs.**

Sumofproducts-ProductofSums-K-mapsimplifications-Don'tcareconditions-QuineMcclausky tabulation method. Combinational Arithmetic Circuits: Adders-Subtractors-fulladder-subtractor-BCD Adder.

Unit-3:COMBINATIONALLOGICCIRCUITS **TeachingHours:8Hrs.**

Multiplexers-De-Multiplexers- Decoders : -Encoders- Decoders-Sequential Logic Circuit: Flip- Flops -RS Flip flop- JK Flip flop- D Flip flop-T Flip flop and Master Slave. Counters-SynchronousandAsynchronous–ShiftRegisters andits types.

Unit-4:BASICSTRUCTUREOFCOMPUTERS **TeachingHours: 7Hrs.**

BasicOperationalConcepts,BusStructures-CentralProcessingUnit:GeneralRegister andstackOrganization-Instruction FormatsAddressing Modes-Data Transferandmanipulation

Unit-5:INPUTOUTPUTANDMEMORYORGANIZATION **TeachingHours:8Hrs.**

PeripheralDevices-I/OInterface-AsynchronousDataTransfer--Priority Interrupt –DirectMemoryAccess–I/OProcessorMemoryOrganization–MainMemory-AuxiliaryMemory–Associative CacheandVirtualMemory.

SEM III	Non-Major Elective -I	Lecture	Practical	Credit
CNCS35	IntroductiontoInformationTechnology	0	4	3

Course Objectives

Thesubjectaimstobuildtheconceptsregarding:

1. Major componentsofComputerSystemanditsworkingprinciples.
2. Role ofanOperatingSystemandbasicterminologiesofnetworks.
3. HowtheInformationTechnologyaidsfortheCurrentScenario.
4. TounderstandtheComputer Software.
5. Tounderstandinternet applications

Course Outcomes

1. After studied unit-1, the student will be able to understand the Major components of ComputerSystemandits workingprinciples.
2. After studiedunit-2,thestudentwillbeabletoknowtheRoleofanOperatingSystemandbasicterminologiesofnetworks.
3. After studied unit-3,thestudentwillbeabletoknow HowtheInformationTechnologyaidsforthe CurrentScenario.
4. Afterstudiedunit-4,thestudentwillbeabletounderstandtheComputerSoftware
5. Afterstudiedunit-5,thestudentwillbeabletounderstandinternetapplications

MatchingTable

Unit	i.Remembering	ii.Understanding	iii.Applying	iv.Analyzing	v.Evaluating	vi.Creating
1	No	No	No	No	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

Unit-1:INTRODUCTION

TeachingHours:6H

rs.

CharacteristicsofComputers-TechnologicalEvolutionofComputers-TheComputerGenerations-Categories of Computer.**Data and Information:**Introduction-Typesof Data-ASimpleModelofaComputer-DataProcessingUsingaComputer-DesktopComputer.**Acquisition ofNumber and Textual Data:** Introduction- Input Units-Internal Representation ofNumericData-RepresentationofCharactersinComputers–Error-DetectingCodes.

Unit-2:DATASTORAGE

TeachingHours:5H

rs.

Introduction-Memory Cell-Physical Devices Used as Memory Cells-Random Access Memory-ReadOnlyMemory-SecondaryMemory-FloppyDiskDrive-CompactDiskReadOnlyMemory (CDROM)-Archival Memory. **Central Processing Unit:** The Structure of aCentralProcessingUnit-Specificationofa CPU-InterconnectionofCPUwithMemoryandI/OUnits.

Unit-3:COMPUTERNETWORKS

TeachingHours:5H

rs.

Introduction-Local Area Network (LAN)- Applications of LAN-Wide Area Network (WAN)–TheFuture of Internet Technology. **Output Devices:** Introduction- Video Display Devices-FlatPanelDisplays–Printers.

Unit-4:COMPUTERSOFTWARE

TeachingHours:5H

rs.

Introduction-OperatingSystem-ProgrammingLanguages–AClassificationofProgrammingLanguages. **Data Organization:** Introduction-Organizing aDatabase-Structure of a Database-Database ManagementSystem-Example ofDatabase Design.

Unit-5:SOMEINTERNET APPLICATIONS

TeachingHours:5H

rs.

Introduction-E-mail-InformationBrowsingService-TheWorldWideWeb-

InformationRetrieval from the World WideWeb-Other FacilitiesProvidedby Browsers - AudioontheInternet.**SocietalImpacts ofInformation Technology:**CareersinInformationTechnology.

SEM III	LANGUAGE	**Lecture**	**Practical**	**Credit**
FLT30	**TAMIL III**	**6**	**0**	**4**

Nehf;fk;

9. khzth;fs; tho;f;ifapy; mwnewpAld; tho;tjw;Fk; kdijxUKfgLj;Jtjw;Fk; gf;jp ,yf;fpaq;fSk; rpw;wpyf;fpaq;fSk; khzth;fSf;Fgad;gLfpwJ.
10. gf;jp ,yf;fpaj;jpd; thapyhfGuhzq;fspd; Kf;fpaj;Jtj;ijAk; nja;tq;fspd; ngUikfisAk; khzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.
11. flTsh;fisAk; murh;fisAk; Nguhpyf;fpaq;fs; Ngrpafhyq;fspy; rpw;wpyf;fpaq;fs; vspakf;fspd; tho;f;ifKiwiagw;wpNgRfpwJvd;gijkhzth;fs; mwpe;Jf;nfhs;fpwhh;fs;.
12. khzth;fs; tho;f;ifapy; mwk;>xOf;fk; rhh;e;jnray;ghLfspy; jq;fis ,izj;Jf;nfhs;tjw;Fgf;jpkhh;f;fk; Jizg; Ghpfpd;wj.
13. khzth;fs; ehad;khh;fisfw;gjpdhy; rptDilangUikfismwpe;Jf;nfhs;fpd;wdh;.
14. khzth;fs; Mo;thh;fisgbg;gjdhy; jpUkhy; ngUikfisnjhpe;Jf;nfhs;fpd;wdh;.
15. khzth;fs; rpw;wpyf;fpaq;fisthrpg;gjpdhy; 96 tifahdrpw;wpyf;fpaq;fisg; gw;wpGhpe;Jf;nfhs;fpd;wdh;.
16. nkhopj;jpwd; gapw;rpngWtjpd; thapyhfkhzth;fs; nghJf;fl;Liufs; vOJtjw;Fg; gapw;rpg;ngWfpwhh;fs;

myF – 1 ftpij

1. jpUehTf;furh; - jpUtjpif gjpfk;
($w;whapdthW tpsf;fsPh; -
Kjy; 5 ghly;fs;)
2. khzpf;fthrfh; - mr;Nrhgjpfk;
(Kf;jp newpNa mwpahj –
Kjy; 5 ghly;fs;)
3. jpU%yh; - fy;tp
(Kjy; 5 ghly;fs;)

myF -2

1. Mz;lhs; - ehr;rpahh; jpUnkhop
(fw;G+uk; ehWNkh – vdj; njhlq;Fk;
5 ghly;fs; kl;Lk;)
2. FyNrfuho;thh; - ngUkhs; jpUnkhop (4-Mk; jpUnkhop)
3. ek;kho;thh; - cah;tu cah;eyk; cilatd;
(vdj; njhlq;Fk; 5 ghly;fs;)

myF -3
1. gygl;lil nrhf;fehjg;Gyth; - mofh; fps;is tpL J}J
2. n[aq;nfhz;lhh; - fypq;fj;Jg;guzp (filj;jpwg;G)
3. Kf;$lw;gs;S - Vry;
myF -4
1. fz;zjhrd; - VRfhtpak; (Cjhhpg;gps;is)
2. Fzq;Fb k];jhd; rhfpG - k];jhd; rhfpG ghly;fs;
guh guf;fz;zp (1-40 fz;zpfs;)
3. gl;bdj;jhh; ghly;fs; - jpUtpil kUJ}h;
(fhNl jphpe;J – vdj; njhlq;Fk; ghly;
gh.vz;.279> 280)
myF -5
1. Neh;fhzy;
2. ehspjOf;F mwpf;ifj; jahupj;jy;
3. ghlg;gFjpiaxl;ba ,yf;fpa tuyhW
irt> itzt rka ,yf;fpaq;fs;> fpwp];JtKk; jkpOk;> ,];yhkpaKk; jkpOk;.

SEM III	GENERAL ENGLISH	**Lecture**	**Practical**	**Credit**
FPE30	**ENGLISH III**	**6**	**0**	**3**

Course Outcomes

CO1 - Recognize their own ability in using the language for speaking with confidence in an intelligible and acceptable manner
CO 2 - Understand the importance of reading for life
CO 3 - Read independently unfamiliar texts with comprehension
CO 4 - Understand the importance of writing in academic life
Write simple sentences without committing error of spelling or grammar

Course Objectives

To develop the language skills of students by offering adequate practice in professional contexts. To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
To focus on developing students' knowledge of domain specific registers and the required language skills.
To develop strategic competence that will help in efficient communication
To sharpen students' critical thinking skills and make students culturally aware of the target situation.

Syllabus

UNIT 1: COMMUNICATION

"1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)
5. Writing: Letters and Emails in professional context

6. Grammar in Context:
 Wh and yes or no,
 Q tags
 Imperatives
7, Vocabulary in Context: Word formation - .
i) Creating antonyms using Prefixes
ii) Intensifying prefixes (E. g inflammable)
Changing words using suffixes
A) Noun Endings
B) Adjective Endings
C) Verb Endings "

UNIT 2: DESCRIPTION

"Listening – Listening to process description
Speaking - Role play
Formal: With faculty and mentors in academic environment, workplace communication
Informal: With peers in academic environment, workplace communication
Reading –Reading passages on products, equipment and gadgets
Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)
Picture Description – Description of Natural Phenomena
Grammar in Context: Connectives and linkers.
Vocabulary – Synonyms (register) - Compare & contrast expressions.
+"

UNIT 3: NEGOTIATION STRATEGIES

"Listening - Listening to interviews of specialists / inventors in fields (Subject specific)
Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)
Reading – longer Reading text. (Comprehensive passages)
Writing – Essay Writing (250 words essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)
Grammar in Context: Active voice & Passive voice – If conditional -
Collocations –Phrasal verbs "

UNIT 4: PRESENTATION SKILLS

"Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)
Speaking –Short speech
- Making formal presentations (PPT)
Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.
Writing - Writing Recommendations
Interpreting visuals - charts / tables/flow diagrams/charts
Grammar in Context – Modals

Vocabulary (register) - Single word substitution "

UNIT 5: CRITICAL THINKING SKILLS

"Listening - Listening to advertisements/news and brief documentary films (with subtitles)
Speaking – Simple problems and suggesting solutions.
Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)
Writing Studying problem and finding solutions- (Essay in 200 words)
Grammar-Make simple sentences
Vocabulary -Fixed expressions"

Text Book

NIL

References

NIL

SEM III	ALLIED I	**Lecture**	**Practical**	**Credit**
FAMA42	**Statistical Methods and their Applications-II**	**7**	**0**	**5**

Unit-1: **TeachingHours: 10Hrs.**

Curvefittingbythemethodsofleastsquares-$Y= ax+ b$,$Y= ax^2+ bx+ c$,$Y= ax^b$,$Y =a e^{bx}$andY=ab^x

Unit-2: **TeachingHours:11Hrs.**

SampleSpace-events-probability-AdditionandMultiplicationTheorem-conditionalprobability - Baye's Theorem. Mathematical expectation Addition and Multiplication theorem,Chebychev's Inequality.

Unit-3: **TeachingHours: 10Hrs.**

Standarddistributions-Binomial, Poisson, Normaldistributionandfittingofthesedistributions.

Unit-4: **TeachingHours: 10Hrs.**

TestofSignificance-smallsampleandlargesampletestbasedonmean,S.D.correlationandproportion-confidenceinterval.

Unit-5: **TeachingHours: 11Hrs.**

Analysisofvariance-OneandTwowayclassifications-BasicprincipleofdesignofExperiments-Randomisation,Replicationand Localcontrol-C.R.D.,R.B.D.and L.S.D.

ReferenceBook:

1. FundamentalofMathematicalStatistics-S.C.Gupta&V.K.Kapoor-SultanChand
2. FundamentalofApplied Statistics-S.C.Gupta&V.K.Kapoor–SultanChand
3. StatisticalMethods-SnedecorG.W.&Cochran W.G.oxford &+DII
4. ElementsofStatistics -Mode.E.B.–Prentice Hall

SEM IV	CORE THEORY	**Lecture**	**Practical**	**Credit**
CCS41	**RELATIONAL DATABASE MANAGEMENT SYSTEM**	**5**	**0**	**4**

Objective:

- ✓ The students are able to understand database concepts and database management system software and have a high-level understanding of major DBMS components and their function.
- ✓ The students are able to understand the E R model and relational model.
- ✓ The students are able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- ✓ The students are able to Understand Functional Dependency and Functional Decomposition.
- ✓ The students are able to understand the architecture of database management systems and also understand the various different architectures such as server system architecture, parallel systems and distributed database systems.

Course Outcomes:

- Describe the database architecture and its applications Sketch the ER diagram for real world applications Uses various ER diagrams for a similar concept from various sources.
- Discuss about relational algebra and calculus Construct various queries in SQL and PL/SQL Compiles various queries in SQL, Relational Calculus and Algebra.
- Describe the various normalization forms Apply the normalization concepts for a table of data Practices a table and implement the normalization concepts.
- Explain the storage and accessing of data.
- Illustrate the query processing in database management. Define the concurrency control and deadlock concept

UNIT- I: DATABASE ARCHITECTURE AND ER DIAGRAM 12 Hours

Database system applications - Purpose of database systems - View of data- Database languages - Database architecture - Database users and administrators - History of database systems-Entity relationship modeling: entity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, sub classes; super classes, inheritance, specialization and generalization

UNIT- II: RELATIONAL DATA MODEL 12 Hours

Relational model concepts, Relational constraints, Relational Languages: Relational Algebra, The Tuple Relational Calculus - The Domain Relational Calculus - SQL: Basic Structure-Set Operations-Aggregate Functions-Null Value-Nested Sub Queries-Views Complex Queries Modification Of Database-Joined Relations-DDL-Embedded SQL-Dynamic SQL-Other SQL Functions- -Integrity and Security.

UNIT – III: DATA NORMALIZATION 12 Hours

Pitfalls in relational database design – Decomposition – Functional dependencies – Normalization – First normal form – Second normal form – Third normal form – Boyce-codd normal form – Fourth normal form – Fifth normal form

UNIT- IV: STORAGE AND FILE ORGANIZATION 12 Hours

Disks - RAID -Tertiary storage - Storage Access -File Organization – organization of files - Data Dictionary storage

UNIT- V: QUERY PROCESSING AND TRANSACTION MANAGEMENT 12 Hours

Query Processing - Transaction Concept - Concurrency Control –Locks based protocol Deadlock Handling -Recovery Systems

TEXT BOOK:

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, Database Systems Concepts, Sixth Edition, McGraw Hill, 2010. 2. Raghu Ramakrishnan and Johannes Gehrke, Database management systems, Third Edition,2002

REFERENCES

1. Bipin Desai, An Introduction to database systems, Galgotia Publications, 2010. 2. RamezElamassri, Shankant B-Navathe, Fundamentals of Database Systems, Pearson, 7th Edition, 2015

E - REFERENCES

1. NPTEL, Introduction to database design, Dr P Sreenivasa Kumar Professor CS&E, Department, IIT, Madras
2. 2. NPTEL, Indexing and Searching TechniquesinDatabasesDr. ArnabBhattacharya,IIT Kanpur.

SEM IV	CORE PRACTICAL	**Lecture**	**Practical**	**Credit**
BPCS46	**RDBMS LAB**	**0**	**4**	**3**

Objectives:

- ✓ To understand the concepts of DDL/DML/DCL/TCL commands.
- ✓ To understand the concepts of Join queries.
- ✓ To understand the concepts of exception handling.
- ✓ To understand the concepts of cursors.
- ✓ To understand the concepts of packages.

Course Outcomes:

- Design and Implement a database schema for a given problem domain.

- Populate and Query a database using SQL, DDL/DML Commands.
- Build well formed in String Date/Aggregate Functions.
- Design and Implement a database query using Joins, Sub-Queries and Set Operations.
- Program in SQL including Objects (Functions, Procedures, Triggers)

LAB EXERCISES:

1. Execute a single line query and group functions.
2. Execute DDL Commands.
3. Execute DML Commands
4. Execute DCL and TCL Commands.
5. Implement the Nested Queries.
6. Implement Join operations in SQL
7. Create views for a particular table
8. Implement Locks for a particular table.
9. Write PL/SQL procedure for an application using exception handling.
10. Write PL/SQL procedure for an application using cursors.
11. Write a PL/SQL procedure for an application using functions
12. Write a PL/SQL procedure for an application using package

REFERENCE BOOK:

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, Database Systems Concepts, Sixth Edition, McGraw Hill, 2010. 2. Raghu Ramakrishnan and Johannes Gehrke, Database management systems, Third Edition,2002

SEM V	CORE THEORY	Lecture	Practical	Credit
CCS51	MOBILE APPLICATION DEVELOPMENT	6	0	4

Objectives

1. To understand the basics concept of mobile applications
2. To understand the structure of mobile applications
3. To understand simple mobile applications
4. To understand the mobile application services
5. To understand real life mobile application development.

Course Outcomes (five outcomes for each unit should be mentioned)

1. After studying unit-1, the student will be able to understand the basics of smartphones and android platforms**.**
2. After studying unit-2, the student will be able to understand the basic concepts of user interface related to app development.
3. After studying unit-3, the student will be able to understand the importance of data persistence in a mobile environment.
4. After studying unit-4, the student will be able to understand the various services and network facilities provided by android platform.
5. After studying unit-5, the student will be able to understand the various apps deployed and developed on a mobile platform.

SYLLABUS

UNIT 1 - INTRODUCTION TO MOBILE APPLICATIONS: Native and web applications - Mobile operating systems and applications - Mobile Databases. Android: History of Android - Android Features – OSS – OHA - Android Versions and compatibility - Android devices - Prerequisites to learn Android -– Setting up software – IDE - XML. Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications.

UNIT 2 - ANDROID DEVELOPMENT: Java - Android Studio – Eclipse – Virtualization – APIs and Android tools – Debugging with DDMS – Android File system – Working with emulator and smart devices - A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity. Intents – Intent Filters – Activity stack.

UNIT 3 - ANDROID SERVICES: Simple services – Binding and Querying the service – Executing services - Broadcast Receivers: Creating and managing receivers – Receiver intents – ordered broadcasts. Content Providers: Creating and using content providers – Content resolver. Working with databases: SQLite – coding for SQLite using Android – Sample database applications – Data analysis.

UNIT 4 - ANDROID USER INTERFACE: Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame. Menus: Option menu – context menu - pop-up menu – Lists and Notifications: creation and display. Input Controls: Buttons-Text Fields-Checkboxes-alert Dialogs-Spinners-rating bar-progress bar.

UNIT 5 - PUBLISHING AND INTERNATIONALIZING MOBILE APPLICATIONS: Live mobile application development: Game, Clock, Calendar, Convertor, Phone book. App Deployment and Testing: Doodle app – Tip calculator app – Weather viewer app.

REFERENCES

1. Barry Burd, "**Android Application Development – All-in-one for Dummies**", 2nd Edition, Wiley India, 2016.
2. Paul Deitel, Harvey Deitel, Alexander Wald, "**Android 6 for Programmers – An App-driven Approach**", 3rd edition, Pearson education, 2016.
3. Jerome (J. F) DiMarzio, "**Android – A Programmer's Guide**", McGraw Hill Education, 8th reprint, 2015.
4. **http://www.developer.android.com**

SEM V	CORE THEORY	Lecture	Practical	Credit
CCS52	**OPERATING SYSTEM**	6	0	4

Course Objectives

1. To understand the structure and functions of operating systems.
2. To understand the principles of scheduler, scheduler algorithms and Deadlock.
3. To learn various memory management schemes.
4. To understand the memory management services
5. To study I/O management, File system and Mass Storage Structure.

Course Out Comes (five outcomes for each unit should be mentioned)

1. After studying unit-1, the student will be able to understand the basics of smartphones and android platforms**.**
2. After studying unit-2, the student will be able to understand the basic concepts of user interface related to app development.
3. After studying unit-3, the student will be able to understand the importance of data persistence in a mobile environment.
4. After studying unit-4, the student will be able to understand the various services and network facilities provided by android platform.
5. After studying unit-5, the student will be able to understand the various apps deployed and developed on a mobile platform.

SYLLABUS

UNIT 1 - Operating System Basics - Services of Operating System-Classification of Operating System- Architecture and Design of an Operating System-Process Management -Introduction to Process-Process State -PCB - Process Scheduling - Interprocess Communication

UNIT 2 - Operating System Scheduling CPU Scheduling: Introduction - Types of CPU Scheduler - Scheduling Criteria - Scheduling Algorithms - FCFS Scheduling – SJF Scheduling; - Priority Scheduling - Round-Robin Scheduling- Multilevel Queue Scheduling - Deadlock - Basic Concept of Deadlock- Deadlock Prevention - Deadlock Avoidance- Deadlock - Detection and Recovery

UNIT 3 - Memory management - Address Binding; Logical and Physical Address Space-Memory Partitioning - Memory Allocation-Protection-Fragmentation and Compaction

UNIT 4 – Swapping - Using Bitmaps - Using Linked Lists- Paging-Mapping of Pages to Frames - Hierarchical Page Tables- Segmentation - Virtual Memory - Basic Concept of Virtual Memory-Demand Paging - Transaction Lookaside Buffer (TLB) - Inverted Page Table-Page Replacement Algorithms

UNIT 5 - File Management File Management - Basic Concept of File-Directory Structure-File Protection-Allocation Methods – Various Disk Scheduling algorithms

REFERENCES

1. Abraham Silberschatz Peter B. Galvin, G. Gagne, "**Operating System Concepts**", Sixth Edition, Addison Wesley Publishing Co., 2003.

2. W. Stallings, "**Operating systems - Internals and Design Principles**", 6th Edition, Pearson
3. William - Stalling "**Operating System**" Fourth Edition, Pearson Education, 2003.

SEM V	CORE THEORY	Lecture	Practical	Credit
CCS53	**Design and Analysis of Algorithms**	**4**	**0**	**2**

Course Objectives

1. To learn about the basics of various algorithms.
2. To understand the fundamentals of divide and conquer techniques.
3. To understand the basic algorithms that use greedy methods.
4. To apply the concept of traversal and searching algorithms.
5. To understand the concept of backtracking methods.

Course Outcomes (five outcomes for each unit should be mentioned)

1. After studying unit-1, the student will be able to understand various algorithm design techniques.
2. After studying unit-2, the student will be able to understand the basis of efficient algorithms for all kinds of problems**.**
3. After studying unit-3, the student will be able to use a simple approach which tries to find the best solution at every step.
4. After studying unit-4, the student will be able to provide a general insight into the dynamic programming approach.
5. After studying unit-5, the student will be able to understand the algorithm design paradigm for discrete and combinatorial optimization problems.

UNIT – I: ALGORITHM AND ANALYSIS

Objective: Understanding various algorithm design techniques.

Elementary Data Structures: Stack – Queues – Trees – Priority Queue – Graphs – What is an Algorithm? – Algorithm Specification – Performance Analysis: Space Complexity – Time Complexity – Asymptotic Notation – Randomized Algorithms.

UNIT – II: DIVIDE AND CONQUER

Objective: This technique is the basis of efficient algorithms for all kinds of problems**.**

General Method – Binary Search – Recurrence Equation for Divide and Conquer – Finding the Maximum and Minimum–– Merge Sort – Quick Sort – Performance Measurement – Randomized Sorting Algorithm – Selection Sort – A Worst Case Optimal Algorithm – Implementation of Select2 – Stassen's Matrix Multiplications.

UNIT – III: THE GREEDY METHOD

Objective: This is a simple approach which tries to find the best solution at every step.

The General Method – Container Loading – Knapsack Problem – Tree Vertex Splitting – Job Sequencing with Deadlines – Minimum Cost Spanning Trees – Prim's Algorithm – Kruskal's Algorithm – An optimal Randomized Algorithm – Optimal Storage on Tapes – Optimal Merge Pattern – Single Source Shortest Paths.

UNIT – IV: DYNAMIC PROGRAMMING, TRAVERSAL & SEARCHING

Objective: Providing a general insight into the dynamic programming approach.

The General Method – Multistage Graphs – All Pair Shortest Path – Optimal Binary Search Trees – String Editing – 0/1 Knapsack – Reliability Design – The Traveling Salesperson Problem. Techniques for Binary Trees – Techniques for Graphs – BFS – DFS.

UNIT – V: BACKTRACKING & BRANCH AND BOUND

Objective: Algorithm design paradigm for discrete and combinatorial optimization problems. The General Method – The 8– Queens Problem – Sum of Subsets– Graph Coloring – Hamiltonian Cycles – Branch and Bound: General Method – LC Branch and Bound – FIFO Branch and Bound.

TEXT BOOKS:

1. "Fundamentals of Computer Algorithms", Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, Galgotia Publications, Second Edition 2015.
2. "Introduction to Algorithms", Coremen T.H., Leiserson C.E. and Rivest R.L., PHI Publications, Third Edition, 1998.

REFERENCES:

1. "Introduction to the Design and Analysis of Algorithms", AnanyLevitin, Pearson Education, 2nd Edition.
2. "Introduction to Algorithms" Thomas H Cormen, Charles E Leiserson, Ronald L Rivest and Clifford Stein, Prentice Hall of India, New Delhi, Second Edition, 2007.
3. "Computer Algorithms – Introduction to Design & Analysis" Sara Baase and Allen Van Gelder, Pearson Education New Delhi, Third Edition, 2000.

SEM V	CORE PRACTICAL	Lecture	Practical	Credit
CPCS56	MOBILE APPLICATION DEVELOPMENT LAB	0	4	3

Course Objectives

1. To learn about the basics of developing android applications.
2. To understand the usage of the controls in android application.
3. To understand the advanced controls that are used in android applications.
4. To understand how the alerts are worked in application.
5. To understand the concept of connecting a database into the application.

Course Outcomes:

1. Able to understand about the basic developments of android applications
2. Able to understand the usage of the controls in android application.
3. Able to understand the advanced controls that are used in android applications.
4. Able to understand how the alerts are worked in application.
5. Able to understand the concept of connecting a database into the application.

SYLLABUS

1. Develop an application that uses GUI components, Font and Colors.
2. Develop an application that uses Intent and Activity.
3. Develop an application that uses Layout Managers and event listeners.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of RSS Feed.
6. Implement an application that implements Multi-threading.
7. Develop an application that creates an alarm clock.
8. Develop an application Using Widgets.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Develop an application that makes use of databases.

REFERENCES

NIL

SEM V	CORE PRACTICAL	Lecture	Practical	Credit
CPCS57	**OPERATING SYSTEM LAB**	**0**	**4**	**3**

Course Objectives

1. To learn about the basics of UNIX commands and shell programming.
2. To understand the programming knowledge of scheduling algorithms.
3. To understand the working of semaphores in an operating system.
4. To understand how to code various algorithms used in operating systems.
5. To understand how to code and the working procedure of file management concepts in the operating system.

Course Outcomes:

1. Able to understand the basics of UNIX commands and shell programming.
2. Able to understand the programming knowledge of scheduling algorithms.
3. Able to understand the working of semaphores in an operating system.
4. Able to understand how to code various algorithms used in operating systems.
5. Able to understand how to code and the working procedure of file management concepts in operating systems.

SYLLABUS

1. Basics of UNIX commands.
2. Shell Programming.
3. Implement the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
4. Implement all file allocation strategies
   a) Sequential b) Indexed c) Linked
5. Implement Semaphores
6. Implement all File Organization Techniques

a) Single level directory b) Two level c) Hierarchical d) DAG

7. Implement Bankers Algorithm for Dead Lock Avoidance
8. Implement an Algorithm for Dead Lock Detection
9. Implement e all page replacement algorithms
   a) FIFO b) LRU c) LFU
10. Implement Shared memory and IPC
11. Implement Paging Technique of memory management.
12. Implement Threading & Synchronization Applications.

REFERENCES

NIL

SEM V	ELECTIVE I	Lecture	Practical	Credit
CECS54A	DATA MINING	3	0	3

Course Objectives

1. To learn about the basics of data and data mining concepts.
2. To understand the fundamentals of analytical and data warehousing concepts
3. To understand the techniques that are followed in data mining.
4. To understand the basics of outlier detection and clustering concepts
5. To understand the tools that are used in data mining.

Course Outcomes (five outcomes for each unit should be mentioned)

1. After studying unit-1, the student will be able to understand the basics of data mining and data.
2. After studied unit-2, the student will be able to understand about the methods of Data Warehousing
3. After studied unit-3, the student will be able to understand about the techniques of Data Mining
4. After studied unit-4, the student will be able to understand about the importance of Cluster and outlier detection
5. After studied unit-5, the student will be able to improve the student's knowledge with recent trends and tools

SYLLABUS

UNIT 1 - Data Mining Basics Introduction: Definition of data mining - data mining vs. query tools - machine learning - steps in data mining process - overview of data mining techniques.

UNIT 2 - Data Models Multidimensional Data Model - Data Cube - Dimension Modeling - OLAP Operations - Meta Data - Types of Metadata.

UNIT 3 - Data Editing Data Pre-Processing and Characterization: Data Cleaning - Data Integration and Transformation - Data Reduction - Data Mining Query Language - Generalization - Summarization - Association Rule Mining

UNIT 4 - Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT 5 - Analysis Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis. Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining.

REFERENCES

1. PaulrajPonnaiah, "**Data Warehousing Fundamentals"**, Wiley Publishers, 2001.
2. Jiawei Han, MichelineKamber, "**Data Mining: Concepts and Techniques**",Morgan Kaufman Publishers, 2006.
3. Usama.Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth RamasamyUthurusamy, "**Advances in Knowledge Discovery and Data Mining**", the M.I.T. Press, 2007.
4. Ralph Kimball, Margy Ross, "**The Data Warehouse Toolkit, John Wiley and Sons Inc**"., 2002
5. Alex Berson, Stephen Smith, Kurt Thearling, "**Building Data Mining Applications for CRM**", Tata McGraw Hill, 2000.
6. Margaret Dunham, "**Data Mining: Introductory and Advanced Topics**", Prentice Hall, 2002.
7. Daniel T. Larose John Wiley & Sons, Hoboken, "**Discovering Knowledge in Data: An Introduction to Data Mining**", New Jersey, 2004.

SEM V	ELECTIVE I	Lecture	Practical	Credit
CECS54B	**Information Security**	3	0	3

Course Objectives

1. To learn about the basics of information security.
2. To understand the fundamentals of information security.
3. To understand the risk management techniques.
4. To understand the current techniques that are used in information security.
5. To understand the concept of networking concepts and techniques.

Course out Comes (five outcomes for each unit should be mentioned)

1. After studied unit-1, the student will be able to understand the basic concepts of Information Security
2. After studied unit-2, the student will be able to understand the legal, ethical and professional issues in Information Security
3. After studied unit-3, the student will be able to know about risk management
4. After studied unit-4, the student will be able to understand the technological aspects of Information Security
5. After studied unit-5, the student will be able to understand the concepts of Cryptography and Hacking methods

UNIT I: INFORMATION SECURITY BASICS

Objective: To understand the basic concepts of Information Security

Introduction –History – What is Information Security? – Critical Characteristics of Information – NSTISSC Security Model – Components of an Information System – Securing the Components – Balancing Security and Access – The SDLC – The Security SDLC.

UNIT II SECURITY INVESTIGATION

Objective: To understand the legal, ethical and professional issues in Information Security

Security – Business Needs – Threats – Attacks – Legal – Ethical and Professional Issues – Relevant U.S. Laws – International Laws and Legal Bodies – Ethics and Information Security – Codes of Ethics and Professional Organizations

UNIT III SECURITY ANALYSIS

Objective: To know about risk management

Risk Management – Introduction – An Overview of Risk Management – Risk Identification – Risk Assessment – Risk Control Strategies – Selecting a Risk Control Strategy –Quantitative versus Qualitative Risk Control Practices – Risk Management Discussion Points

UNIT IV SECURITY MODELS

Objective: To understand the technological aspects of Information Security

Logical Design – Blueprint for Security – Information Security Policy – Standards and Practices– ISO 17799/BS 7799– NIST Models– VISA International Security Model – Design of Security Architecture – Planning for Continuity – Security Physical Design –Firewalls –Security Technology – IDS – IPS – Honey Pots – Honey Nets – Padded cell Systems Scanning and Analysis Tools – Access Control Devices.

UNIT V: CRYPTOGRAPHY AND ETHICAL HACKING

Objective: To understand the concepts of Cryptography and Hacking methods

Cipher methods – Cryptographic Algorithms and Tools – Attacks on Cryptosystems–Hacking – Effects of Hacking – Hacker – Types of Hacker– Ethical Hacker –Hacktivism– Networking & Computer Attacks – Malicious Software (Malware) – Protection Against Malware – Intruder Attacks on Networks and Computers – Wireless Hacking– Windows Hacking – Linux Hacking Session.

TEXT BOOKS:

1. "Principles of Information Security", Michael E Whitman and Herbert J Mattord, 5th Edition, Vikas Publishing House, New Delhi, 2003.
2. "Fundamentals of Information Systems Security", David Kim,MichaelG.Solomon, 3rd Edition ,Jones & Bartlett Learning, October 2016.
3. "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy", Patrick Engebretson, 2nd Edition, Syngress Basics Series – Elsevier, 2011.
4. "Hands-On Ethical Hacking and Network Defense", Michael T. Simpson, Kent Backman, James E. Corley, Second Edition, CENGAGE Learning, 2010.

REFERENCES:

1. "Handbook of Information Security Management", Micki Krause, Harold F. Tipton, sixth Edition, CRC Press LLC, 2004.
2. "Hacking Exposed", Stuart McClure, Joel Scrambray, George Kurtz, Tata McGraw–Hill, 2003.
3. "Computer Security Art and Science", Matt Bishop, 2ndEdition , Pearson/PHI, 2002.

SEM V	ELECTIVE I	Lecture	Practical	Credit
CECS54C	SOFTWARE TESTING	3	0	3

Course Objectives

1. To understand the basics of software testing.

2. To understand the fundamentals of software development models.

3. To understand the structural testing methods.

4. To understand the current techniques that are used in object oriented testing models.

5. To understand the concept of software testing quality details.

Course Out Comes (five outcomes for each unit should be mentioned)

1. After studied unit-1, the student will be able to understand the concept of software testing, and software quality

2. After studied unit-2, the student will be able to learn to inspect and detect errors by going through each and every code segment

3. After studied unit-3, the student will be able to gain knowledge of various functional and structural testing techniques

4. After studied unit-4, the student will be able to understand basic concept of Software Management tools and object oriented testing

5. After studied unit-5, the student will be able to understand basic concept of Software quality and software quality assurance

UNIT I: INTRODUCTION TO SOFTWARE TESTING

Objective: To understand the concept of software testing, and software quality

Fundamentals of software testing – need for software testing– Psychology of testing – various approaches – characteristics of testing – principles of testing – testing strategies – verification and validation – Defect and Prevention strategies.

UNIT II: SOFTWARE DEVELOPMENT MODEL AND TESTING

Objective: To learn to inspect and detect errors by going through each and every code segment

Waterfall model– V–model– Spiral model– Agile model – Life cycle of testing– Static Testing – dynamic testing – White box testing – Block box testing – Regression testing – Integration Testing – System and Performance Testing – Usability Testing

UNIT III: FUNCTIONAL AND STRUCTURAL TESTING

Objective: To gain knowledge of various functional and structural testing techniques

Boundary Value Analysis – Equivalence Class Testing – Decision Table – Based Testing – Cause Effect Graphing Technique – Path testing –Cyclomatic Complexity – Graph Metrics – Data Flow Testing – Slice based testing

UNIT IV: TEST MANAGEMENT AND TOOLS

Objective: To understand basic concept of Software Management tools and object oriented testing

Test planning – cost–benefit analysis of testing – monitoring and control– test reporting – test control – Specialized testing – Object Oriented Testing – Automated Tools for Testing – Tool Selection and Implementation – Challenges in test automation– GUI Testing

UNIT V: SOFTWARE QUALITY AND SOFTWARE QUALITY ASSURANCE

Objective: To understand basic concept of Software quality and software quality assurance

Introduction to software quality and software quality assurance – basic principles about the software quality and software quality assurance – Planning for SQA – various models for software product quality and process quality – SCM – RAD – System Documentation

TEXT BOOKS:

1. "Software Testing– A Craftsman's Approach" – Paul C. Jorgensen – Second Edition – CRC Press 2008
2. "Software Testing", – Ron Patton, Second Edition –Sams Publishing, Pearson Education, 2007.
3. "Software Testing– A Craftsman's Approach" – Paul C. Jorgensen, Second Edition – CRC Press, 2008

REFERENCES:

1. "Software Testing and Analysis: Process, Principles and Techniques" – Mauro Pezze, Michal Young – Wiley India , 2008
2. "Software Engineering" – K.K. Aggarwal&Yogesh Singh – New Age International Publishers – New Delhi, 2003.
3. "Software Testing – Principles and Practices" –SrinivasanDesikan and Gopalaswamy Ramesh, Pearson Education, 2006.

SEM V	SKILL BASED SUBJECT III	Lecture	Practical	Credit
CSCS55	SOFTWARE ENGINEERING	3	0	2

Course Objectives

1. To understand the basic method to develop a software.

2. To understand the fundamentals for choosing requirements of the project.

3. To understand the concept of software engineering.

4. To understand the methods involved in software testing.

5. To understand the basic knowledge in software project management.

Course Out Comes (five outcomes for each unit should be mentioned)

1. After studying unit-1, the student will be able to understand the concepts and methods required for the construction of large software intensive systems.

2. After studying unit-2, the student will be able to get the idea of choosing the Requirements in Software Engineering.

3. After studying unit-3, the student will be able to GIVE an understanding of the concept of Data Engineering.

4. After studying unit-4, the student will be able to impart knowledge on Testing and Debugging.

5. After studying unit-5, the student will be able to enable the students to learn the basics of Project Management & Scheduling.

UNIT–I: INTRODUCTION TO EVOLVING SOFTWARE

Objective: Introduces the concepts and methods required for the construction of large software intensive systems.

Evolving Role of Software – Nature of Software – Software Engineering – The Software Process– Software Engineering Practices – Software Myths – A Generic View of Process Model – Process Assessment and Improvement – Process Models : Waterfall Model – Incremental Process Models – Evolutionary Process Models – Concurrent Models.

UNIT–II: REQUIREMENTS ENGINEERING

Objective: Gets the idea of choosing the Requirements in Software Engineering.

Requirements Engineering: Establishing the Groundwork – Initiating the Requirements Engineering Process – Eliciting Requirements – Collaborative Requirements Gathering – Quality Function Deployment – Usage Scenarios – Elicitation work Products – Building the Requirements Model – Elements of Requirements Model – Analysis Pattern – Requirements

Analysis – Data Modeling Concepts.

UNIT–III: DATA ENGINEERING

Objective: Gives an understanding of the concept of Data Engineering.

Data Engineering: Design Process and Design Quality – Design Concepts – The Design Model - Creating an Architectural Design – Software Architecture – Data Design – Architectural style – Architectural Design – Architectural Mapping Using Data Flow – Performing User Interface Design – Golden Rules.

UNIT–IV: TESTING STRATEGIES

Objective: To impart knowledge on Testing and Debugging.

Testing Strategies: Strategic Approach to Software Testing – Strategic Issues – Test Strategies for Conventional and Object Oriented Software – Validation Testing – System Testing – Art of Debugging. Software Testing Fundamentals – White Box Testing – Basis Path Testing – Control Structure Testing – Black Box Testing – Model Based Testing.

UNIT–V: PROJECT MANAGEMENT

Objective: To enable the students to learn the basic of Project Management & Scheduling.

Project Management: Management Spectrum – People – Product – Process – Project – Critical Practices – Estimation: Project Planning Process – Software Scope and Feasibility – Resources – Software Project Estimation – Project Scheduling – Quality Concepts – Software Quality Assurance – Elements of Software Quality Assurance – Formal Technical Reviews.

TEXT BOOKS:

1. ”Software Engineering – A Practitioner’s Approach”, Roger S Pressman, McGraw Hill International Edition, New York: 2005, Seventh Edition
2. ” Software Engineering”, Mall Rajib, PHI Learning, 2009, 3 Third Edition.

REFERENCES:

1. “Software Engineering”, Ian Somerville, Pearson Education, 2006, 7th Edition.
2. “Software Engineering Concepts” Richard Fairley, Tata McGraw–Hill Education, 2011.
3. “Software Engineering: Theory and Practice “, Pfleeger and Lawrence, Pearson Education, 2001, Second Edition.

SEM VI	CORE THEORY	Lecture	Practical	Credit
CCS61	**Open Source Software**	**4**	**0**	**4**

Course Objectives

1. To understand about using pre-existing code to improve the software and even come up with their own innovations.

2. To understand the fundamentals of the LINUX operating system.

3. To understand the concept of scripting code for a website.

4. To understand the fundamentals of PHP language combined with HTML.

5. To understand the fundamentals of PERL languages.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studying unit-1, the student will be able to understand the concept of HTML, HTML5 and CSS.

2. After studied unit-2, the student will be able to learn to inspect and detect errors by going through each and

every code segment.

3. After studying unit-3, the student will be able to understand the basic concept of Java Script and MySQL.

4. After studied unit-4, the student will be able to understand basic concept of PHP

5. After studied unit-5, the student will be able to understand basic concept of PERL

UNIT I: INTRODUCTION TO HTML, CSS

Objective: To understand the concept of HTML, HTML5 and CSS.

Need of Open Source –Advantages of Open source –Application of Open Source – HTML – HTML tags –Dynamic Web content– HTTP Request and Response Procedure–Introduction to HTML5– HTML5 Canvas – HTML5 Audio and Video–Introduction to CSS– CSS Rules–Style Types–CSS Selectors– CSS Colors.

UNIT II: LINUX

Objective: To learn to inspect and detect errors by going through each and every code segment.

Introduction: Linux Essential Commands – Kernel Mode and user mode –File system Concept – Standard Files – The Linux Security Model – Vi Editor – Partitions Creation – Shell Introduction – String Processing – Investigation and Managing Processes – Network Clients – Installing Application.

UNIT III: JAVA SCRIPT AND MYSQL

Objective: To understand the basic concept of Java Script and MySQL.

Java script: Advantages of JavaScript –JavaScript Syntax–Data type– Variable– Array – Operators and Expressions– Loops – functions – Dialog box– MySQL – The show Databases and Table – The USE command –Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement.

UNIT IV: PHP

Objective: To understand basic concept of PHP

PHP Introduction – General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control Statement – Array – Functions – Basic Form Processing – File and Folder Access – Cooking – Sessions – Database Access with PHO.

UNIT V: PERL

Objective: To understand basic concept of PERL

PERL : Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures – Subroutines, Packages, and Modules– Working with Files – Data Manipulation.

TEXT BOOKS:

1. "The Complete Reference Linux", Peterson, Tata McGraw HILL–2010
2. "Perl: The Complete Reference", Martin C. Brown, Tata McGraw Hill Publishing Company Limited, Indian Reprint 2009.
3. "MYSQL: The Complete Reference", VikramVaswani, 2nd Edition, Tata McGrawHill Publishing Company Limited, Indian Reprint 2009
4. "PHP: The Complete Reference", Steven Holzner, 2nd Edition, Tata McGrawHill Publishing Company Limited, Indian Reprint 2009.
5. "Complete Reference HTML", T. A. Powell, 3rd Edition, Tata McGrawHill Publishing Company Limited, Indian Reprint 2002.
6. "Mastering Java script" –J. Jaworski, BPB Publications, 1999

REFERENCES:

1. “Fundamentals of Open Source Software”, by M.N. Rao, PHI publishers.
2. “MySQL Bible”, Steve Suchring, John Wiley, 2002
3. “The Linux Kernel Book”, Remy Card, Eric Dumas and Frank Mevel, Wiley Publications, 2003
4. Ivan Byross, HTML, DHTML, Javascript, Perl, BPB Publication

SEM VI	CORE THEORY	Lecture	Practical	Credit
CCS62	PYTHON PROGRAMMING	4	0	4

Course Objectives:

1. To understand the basic building blocks for PYTHON programming.
2. Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and
functions
3. Work with user input to create fun and interactive programs
4. To acquire Object Oriented Skills in Python
5. To develop the skill of designing Graphical user Interfaces in Python

Course OutComes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the basic building blocks for creating PYTHON
programming in detail.
2. After studied unit-2, the student will be able to understand the control statements and basic methods used in
PYTHON programming
3. After studying unit-3, the student will be able to understand the basic built- in functions.
4. After studied unit-4, the student will be able to understand some advanced methods to use in PYTHON
5. After studied unit-5, the student will be able to understand the concept of objects used in PYTHON

UNIT I:
Identifiers – Keywords - Statements and Expressions – Variables – Operators – Arithmetic operators – Assignment operators – Comparison operators – Logical operators – Bitwise operators - Precedence and Associativity – Data types - Number – Booleans – Strings - Indentation – Comments – Single line comment – Multiline comments - Reading Input – Print Output – Type Conversions – int function – float function – str() function – chr() function – complex() function – ord() function – hex() function – oct() function - type() function and Is operator – Dynamic and Strongly typed language.

UNIT II:
Control Flow Statements – If statement – If else statement – If elif else statement – nested if statement - while loop – for loop – continue and break statements – catching exceptions using try and except statement – syntax errors – exceptions – exception handling – Strings – str() function - Basic string operations – String comparison – Built in functions using strings – Accessing characters in string – String slicing – String joining – split() method – string traversing.

UNIT III:
Functions – Built in functions – function definition and calling - return statement – void function – scope and lifetime of variables – args and kwargs – command line arguments -

Tuples – creation – basic tuple operations – tuple() function – indexing – slicing – built-in functions used on tuples – tuple methods – packing – unpacking – traversing of tuples – populating tuples – zip() function - Sets – Traversing of sets – set methods – frozenset.

UNIT IV:

Lists: Using List- List Assignment and Equivalence – List Bounds- Slicing - Lists and Functions- Prime Generation with a List. List Processing: Sorting-Flexible Sorting- Search- List Permutations- Randomly Permuting a List- Reversing a List.

UNIT V:

Objects: Using Objects- String Objects- List Objects. Custom Types: Geometric Points- Methods- Custom Type Examples- Class Inheritance. Handling Exceptions: Motivation- Exception Examples- Using Exceptions - Custom Exceptions.

TEXT BOOKS:

1. Gowrishankar S, Veena A, "Introduction to Python programming", 1st Edition, CRC Press/Taylor & Francis, 2008. (Units 1-3)
2. Learn to Program with Python, 3th Edition, Richard L. Halterman, Southern Adventist University. (Units 4-5)

REFERENCE BOOKS:

1. Core Python Programming, 2thEdition, Wesley J. Chun, Prentice Hall.
2. Jake VanderPlas,"Python Data Science Handbook:Essential Tools for working with Data",1st edition, O'Reilly Media, 2016.

SEM VI	ELECTIVE II	Lecture	Practical	Credit
CECS63A	BIG DATA ANALYTICS	3	0	3

Course Objectives

1. To explore the fundamental concepts of big data analytics.

2. To learn to use various techniques for mining data streams.

3. To learn the Big Data Business Perspective

4. To understand the applications using Map Reduce Concepts.

5. To introduce programming tools HIVE in the Hadoop ecosystem.

Course Outcomes

1. After studying unit-1, the student will be able to understand the key issues in big data management.

2. After studying unit-2, the student will be able to outline big data planning, processing.

3. After studying unit-3, the student will be able to Acquire fundamental enabling techniques and be scalable.

4. After studying unit-4, the student will be able to examine various big data tools and techniques.

5. After studying unit-5, the student will be able to achieve adequate perspectives of Big Data Analytics in various Applications like recommender systems, Social Media Applications, etc.

UNIT–I: INTRODUCTION TO BIG DATA

Objective: To explore the fundamental concepts of big data analytics.

Introduction to big data: Introduction to Big Data Platform – Challenges of Conventional Systems – Intelligent data analysis – Nature of Data – Characteristics of Data – Evolution of Big Data – Definition of Big Data – Challenges with Big Data – Volume, Velocity, Variety – Other Characteristics of Data – Need for Big Data–Analytic Processes and Tools – Analysis vs. Reporting.

UNIT–II: MINING DATA STREAMS

Objective:To learn to use various techniques for mining data streams.

Mining data streams: Introduction To Streams Concepts – Stream Data Model and Architecture – Stream Computing – Sampling Data in a Stream – Filtering Streams –Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP) Applications – Case Studies – Real Time Sentiment Analysis– Stock Market Predictions.

UNIT III: BIG DATA FROM DIFFERENT PERSPECTIVES

Objective: To learn the Big Data Business Perspective

Big data from business Perspective: Introduction of big data–Characteristics of big data–Data in the warehouse and data in Hadoop– Importance of Big data– Big data Use cases– Patterns for Big data deployment. Big data from Technology Perspective: –Application Development in Hadoop–Getting your data in Hadoop.

UNIT –IV:HADOOP AND MAP REDUCE

Objective: To understand the applications using Map Reduce Concepts.

Hadoop: The Hadoop Distributed File System – Components of Hadoop Analysing the Data with Hadoop– Scaling Out–Hadoop Streaming– Design of HDFS–Java interfaces to HDFS Basics– Developing a Map Reduce Application–How MapReduce Works–Anatomy of a Map Reduce Job run–Failures–Job Scheduling–Shuffle andSort – Task execution – Map Reduce Types and Formats– Map Reduce Features–Hadoop environment.

UNIT – V: FRAMEWORKS

Objective: To introduce programming tools HIVE in the Hadoop ecosystem.

Frameworks: Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive – fundamentals of HBase and ZooKeeper– IBM InfoSphereBigInsights and Streams.

TEXT BOOKS:

1. "Intelligent Data Analysis", Michael Berthold, David J. Hand, Springer, 2007.
2. "Hadoop: The Definitive Guide ", Tom White Third Edition, Oreilly Media, 2012.

REFERENCES:

1. "Big Data and Analytics" SeemaAcharya, Subhasini Chellappan, Wiley 2015.
2. "Mining of Massive Datasets",AnandRajaraman and Jeffrey David Ullman,CUP,2012.
3. "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data" .Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos,McGrawHill Publishing, 2012.
4. "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", Bill Franks, John Wiley& sons, 2012.
5. "Making Sense of Data", Glenn J. Myatt, John Wiley & Sons, 2007.

SEM VI	ELECTIVE II	Lecture	Practical	Credit
CECS63B	CRYPTOGRAPHY	3	0	3

Course Objectives

1. Understand OSI security architecture and classical encryption techniques.

2. Understand the different cryptographic operations of symmetric cryptographic algorithm**s.**

3. Understand the different cryptographic operations of Public key cryptographic algorithms.

4. To make use of application protocols to design and manage a secure system.

5. To learn the configuration and manage E–mail and WLAN Security.

Course Outcomes

1. After studying unit-1, the student will be able to know the security attacks and services.

2. After studying unit-2, the student will be able to understand the concept of Encryption Standards.

3. After studying unit-3, the student will be able to understand public key cryptographic algorithms.

4. After studying unit-4, the student will be able to learn the concept of hash functions.

5. After studying unit-5, the student will be able to understand Email security.

UNIT – I: COMPUTER AND NETWORK SECURITY

Objective: Understand OSI security architecture and classical encryption techniques**.**

Computer Security Concepts –OSI security architecture –Security trends–Security attacks – Security Services– Security Mechanisms –Fundamental Security Design Principles – Attack Surfaces and Attack Trees – Model for Network Security – Network Standards.

UNIT – II:SYMMETRIC CRYPTOGRAPHY

Objective: Understand the different cryptographic operations of symmetric cryptographic algorithm**s.**

Symmetric Cipher – Classical Encryption Technique – Symmetric Cipher Model – Substitution Techniques, Transposition Technique – Steganography – Block Cipher and the Data Encryption Standard – The Data Encryption Standard – Differential and Linear Cryptanalysis – Block Cipher Principles.Advanced Encryption Standard – AES Structure – AES Transformation Function.

UNIT – III:PUBLIC KEY CRYPTOGRAPHY

Objective: Understand the different cryptographic operations of Public key cryptographic algorithms.

Public Key Cryptography and RSA Principles– RSA Algorithm, Key Management and other Public Key Cryptosystems Key Management, Diffie–Hellman Key Exchange, Elliptic Curve Arithmetic – Elliptic Curve Cryptography – Pseudorandom Number Generation**.**

UNIT –IV:HASH FUNCTIONS AND DIGITAL SIGNATURES

Objective: To make use of application protocols to design and manage a secure system.

Cryptographic Hash Functions – Application of Hash Functions – Two Simple Hash Functions – Secure Hash Algorithm(SHA) –Message Authentication Codes –Authentication requirement – Authentication function – MAC – HMAC – CMAC – Digital signature and authentication protocols – Digital Signature Standards –Digital Signatures Schemes– Digital Certificate – Key Management and Distribution.

UNIT –V: SECURITY APPLICATIONS

Objective: To learn the configuration and manage E–mail and WLAN Security.

Intrusion Detection System– Password Management – Introduction to Firewall– Firewall Generations– Web Security – Wireless network Security – Electronic Mail Security– Internet Mail Architecture–S/MIME – Pretty Good Privacy (PGP).

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TEXT BOOKS:

1. "Cryptography and Network security Principles and Practices",William Stallings,Pearson/PHI,Seventh Edition, 2017.
2. "CRYPTOGRAPHY & NETWORK SECURITY" – Principles and Practices, William Stallings, Pearson Education, Third Edition.

REFERENCES:

1. "Modern Cryptography Theory and Practice", Wenbo Mao, Pearson Education, 2004.
2. "Cryptography and Network Security ",BehourzForouzan, DebdeepMukhopadyay,Tata McGraw Hill Education Pvt. Ltd, New Delhi, 2010.
3. "Quantum Cryptography and Secret–Key Distillation", Gilles van Assche, Cambridge University Press, 2010.

SEM VI	ELECTIVE II	Lecture	Practical	Credit
CECS63C	DIGITAL IMAGE PROCESSING	3	0	3

Course Objectives

1. To know the basics of Digital image and techniques.

2. To understand various Image enhancement ideas.

3. To understand Image restoration techniques.

4. To understand degrees of image resolution and compression methods.

5. To understand concepts of image representation and recognition.

Course Outcomes

1. After studying unit-1, the student will be able to understand the concepts like MatLab, DIP, electromagnetic spectrum, etc.

2. After studying unit-2, the student will be able to analyze smoothing and sharpening techniques.

3. After studying unit-3, the student will be able to know about image filters.

4. After studying unit-4, the student will be able to gain knowledge about compression techniques.

5. After studying unit-5, the student will be able to know about image representation.

UNIT – I: FUNDAMENTALS

Objective: To know the basics of Digital image and techniques.

Introduction – Origin – Steps in Digital Image Processing – Components – Applications of DIP – Elements of Visual Perception – Light and Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization – Images in Matlab– Pixels – Color models – Digital Image Processing in Multimedia.

UNIT – II: IMAGE ENHANCEMENT

Objective: To understand various Image enhancement ideas.

Spatial Domain – Gray level transformations – Histogram Quantization – Histogram matching and processing – Basics of Spatial Filtering – Smoothing and Sharpening Spatial Filtering – Introduction to Fourier Series – Fourier Transform – Smoothing and Sharpening frequency domain filters – Ideal – Butterworth and Gaussian filters

UNIT – III: IMAGE RESTORATION AND SEGMENTATION

Objective: To understand Image restoration techniques.

Noise models – Mean Filters – Order Statistics – Adaptive filters – Band reject Filters – Band pass Filters – Notch Filters – Optimum Notch Filtering – Inverse Filtering – Wiener filtering Segmentation: Detection of Discontinuities–Edge Linking and Boundary detection – Region based segmentation– Active Contour Models – Snakes – Fuzzy Connectivity – Morphological processing– erosion and dilation.

UNIT – IV: WAVELETS AND IMAGE COMPRESSION

Objective: To understand degrees of image resolution and compression methods.

Wavelets – Subband coding – Multi resolution expansions – Compression: Fundamentals – Image Compression models – Error Free Compression – Predictive Compression Methods – Vector Quantization – Variable Length Coding – Bit–Plane Coding – Lossless Predictive Coding – Lossy Compression – Lossy Predictive Coding – Compression Standards

UNIT – V: IMAGE REPRESENTATION AND RECOGNITION

Objective: To understand concepts of image representation and recognition.

Knowledge Representation – Statistical Pattern Recognition – Neural Nets – Fuzzy Systems – Chain Code – Polygonal approximation, signature, boundary segments – Shape number – Fourier Descriptor moments – Regional Descriptors – Topological feature, Texture – Patterns and Pattern classes – Recognition based on matching.

TEXT BOOKS

1. "Digital Image Processing," Rafael C. Gonzalez, Richard E.Woods, Prentice Hall, Third Edition, 2008.
2. "Digital Image Processing and Computer Vision," Sonka, Hlavac, Boyle, Cengage Learning, 2009
3. "Fundamentals of Digital Image Processing", Anil Jain K, PHI Learning Pvt. Ltd., 2011.

REFERENCES:

1. **"Digital Image Processing", S. Sridhar, Oxford University Press; Second edition, 2016.**
2. **"Digital Image Processing", Gonzalez & woods, Pearson Education India, 2016.**

SEM VI	ELECTIVE III	Lecture	Practical	Credit
CECS64A	ARTIFICIAL INTELLIGENCE	3	0	3

Course Objectives

1. To know the basics of Artificial Intelligence.

2. To Understand the Methods and Algorithms in AI.

3. To learn to represent knowledge in solving AI problems.

4. To Understand Statistical logics and know about Software agents.

5. To learn how Machine learning is related to AI.

Course Outcomes

1. After studied unit-1, the student will be able to recall the fundamentals of artificial intelligence

2. After studied unit-2, the student will be able to understand the techniques used for AI

3. After studying unit-3, the student will be able to know about knowledge representation.

4. After studying unit-4, the student will be able to gain knowledge about fuzzy logic.

5. After studied unit-5, the student will be able to evaluate the design of new artificial intelligence and machine learning applications

UNIT I: INTRODUCTION TO ARTIFICIAL INTELLIGENCE:

Objective: To know the basics of Artificial Intelligence.

History of AI – Artificial Narrow Intelligence (ANI) – Artificial General Intelligence (AGI) – Artificial Super Intelligence (ASI) – Characteristics – Types of AI – Domains – Programming Languages of AI – Applications of AI – Future of AI.

UNIT II: AI – PROBLEM SOLVING METHODS:

Objective: To Understand the Methods and Algorithms in AI.

Problem solving Methods – Search Strategies: Uninformed – Informed – Heuristics – Generate and test – hill climbing – Best first search – problem reduction – Local Search Algorithms and Optimization – Game Playing mini–max procedure – Optimal Decisions in Games – Alpha – Beta Pruning – Stochastic Games

UNIT III: AI – KNOWLEDGE REPRESENTATION:

Objective: To learn to represent knowledge in solving AI problems.

Procedural Versus declarative knowledge – logic programming – Forward Versus backward reasoning – Matching – Control knowledge – Ontological Engineering– Categories and Objects – Events – Mental Events and Mental Objects – Reasoning Systems for Categories –Reasoning with Default Information.

UNIT IV: STATISTICAL REASONING AND AGENTS:

Objective: To Understand Statistical logics and know about Software agents.

Probability and Bayes Theorem – Certainty factors – Probabilistic Graphical Models – Bayesian Networks – Markov Networks – Fuzzy Logic. Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi–agent systems.

UNIT V: MACHINE LEARNING AND APPLICATIONS

Objective: To learn how Machine learning is related to AI.

Types of Machine Learning – Neural Networks – Deep Learning – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving.

TEXT BOOKS:

1. "Artificial Intelligence", Elaine Rich, Kevin Knight, Tata McGraw Hill, II Edition.
2. "Artificial Intelligence: A Modern Approach," Stuart Russell, Peter Norvig, Third Edition, Prentice Hall of India, New Delhi, 2010.
3. "Prolog: Programming for Artificial Intelligence", I. Bratko, Addison – Wesley Educational Publishers Inc., Fourth edition 2011.

REFERENCES:

1. "Machine Learning for Beginners 2019", Matt Henderson, This Is Charlotte, 2019
2. "Introduction to Artificial Intelligence and Expert Systems", Dan W. Patterson, Pearson, 2015

SEM VI	ELECTIVE III	Lecture	Practical	Credit
CECS64B	SYSTEM SOFTWARE	3	0	3

Course Objectives

1. To understand the basic concepts of system software
2. Ability to trace the path of a source code to object code and to executable file
3. To design and implementation of loaders and linkers
4. To understand the concepts of macro processor
5. Ability to analyze the functions of compilers

Course Outcomes (five outcomes for each units should be mentioned)

1. After studying unit-1, the student will be able to analyze CISC and RISC machines.
2. After studying unit-2, the student will be able to know how assemblers are working.
3. After studying unit-3, the student will be able to distinguish Linker and Loader.
4. After studying unit-4, the student will be able to learn macro processor.
5. After studying unit-5, the student will be able to understand the functions of compilers**.**

SYLLABUS

UNIT 1 - LANGUAGE PROCESSORS

Language Processing Activities – Fundamentals of Language Processing – Fundamentals of Language Specification – Language Processor Development Tools.

UNIT 2 - ASSEMBLERS AND MACRO

Elements of Assembly Language Programming – Overview of Assembly Process - Design of a Two – Pass Assembler - Macro Definition and Call – Macro Expansion – Nested Macro Calls.

UNIT 3 - COMPILER I

Scanning: Finite State Automata – Regular Expressions – Building DFA – Performing Semantic Action – Writing a Scanner – Parsing: Parse Tree and Abstract Syntax Trees – Top Down Parsing – Bottom-Up Parsing.

UNIT 4 - COMPILER II AND INTERPRETERS

Aspects of Compilation –Memory Allocation - Compilation of Expressions-Compilation of Control Structure-Code Optimization - Interpreters.

UNIT 5 - LINKERS

Relocation and Linking Concepts – Design of a Linker – Self-Relocating Programs – Linking for Overlays - Loader.

REFERENCES

D.M. Dhamdhere, "**System Programming and Operating Systems**",Tata McGraw-Hill Publishing Company Limited, New Delhi,1993.

SEM VI	ELECTIVE III	Lecture	Practical	Credit
CECS64C	MOBILE COMPUTING	3	0	3

Course Objectives

1. To understand basic concepts of mobile computing.

2. To learn the basics of mobile telecommunication system

3. To comprehend wireless LAN and cellular systems.

4.To understand protocols at the network and transport layer.

5. To learn development of applications in mobile computing platforms.

Course Outcomes (five outcomes for each unit should be mentioned)

1. After studying unit-1, the student will be able to understand basic concepts of mobile computing.

2. After studying unit-2, the student will be able to learn the basics of mobile telecommunication systems.

3. After studying unit-3, the student will be able to comprehend wireless LAN and cellular systems.

4. After studying unit-4, the student will be able to understand protocols at the network and transport layer.

5. After studying unit-5, the student will be able to learn development of applications in mobile computing platforms.

UNIT I: WIRELESS COMMUNICATION FUNDAMENTALS

Objective: To understand basic concepts of mobile computing.

Introduction–Applications–A short History of wireless Communications–Wireless Transmission – Frequencies for Radio transmission–Signals–Antennas–Signal Propagation–Multiplexing–Modulations–Amplitude shift keying–Frequency shift keying–Phase shift keying–Spread Spectrum.

UNIT II: MEDIUM ACCESS CONTROL AND TELECOMMUNICATION SYSTEM

Objective: To learn the basics of mobile telecommunication systems.

SDMA–FDMA–TDMA–Fixed TDM–Classical Aloha–CDMA–Global System for Mobile Communications –GPRS–Satellite Systems –Basics –Applications–Broadcast Systems – Digital Audio Broadcasting – Digital Video Broadcasting.

UNIT III: WIRELESS NETWORKS

Objective: To comprehend wireless LAN and cellular systems.

Infrared vs. Radio Transmission– Infrastructure Networks–Ad hoc Networks – IEEE 802.11 – System Architecture–Protocol Architecture–Bluetooth–User scenarios–Bluetooth Architecture– Introduction to Wireless ATM –Services–Location Reference Model.

UNIT IV: MOBILE NETWORK LAYER

Objective: To understand protocols at the network and transport layer.

Mobile IP–Goals– Assumption–Entities and Terminology– IP Packet delivery – Agent advertisement and discovery–Registration–Tunneling and encapsulation–Optimizations– Dynamic Host Configuration Protocol (DHCP) –Routing –DSDV–DSR – Alternative Metrics.

UNIT V: WIRELESS APPLICATION PROTOCOL

Objective: To learn development of applications in mobile computing platforms.

Introduction–Protocol Architecture–Wireless Markup Language(WML)–WML Script– Applications–Wireless Telephony Application (WTA) – Wireless Telephony Application Architecture.

TEXT BOOKS:

1. "Mobile Communications", Jochen Schiller –PHI/Pearson Education, Second Edition, 2003.
2. "Mobile Computing", Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal –Tata McGraw Hill Publications, Second edition, 2010.

REFERENCES:

1. "Principles of Wireless Networks", KavehPahalavan, PrasanthKrishnamoorthy, PHI/Pearson Education, 2003.
2. "Fundamentals of Mobile and Pervasive Computing", Frank Adelstein, ,SandeepK.S.Gupta, Golden G.Richard III, Loren Schwiebert –Tata McGraw Hill Publications, 2005.
3. "Wireless Communications and Networks", Williams Stallings–Pearson Education, Second Edition, 2009.