CURRICULUM FRAMEWORK AND SYLLABUS

FOR OUTCOME BASED EDUCATION IN

Bachelor of Computer Science (BSc CS) Degree Program

FOR THE STUDENTS ADMITTED FROM

THE ACADEMIC YEAR 2022-2023 ONWARDS

Naipunnya Institute of Management and Information Technology

(Affiliated to the University of Calicut, Accredited by NAAC with B++, ISO 9001-2015 Certified)
Pongam, Koratty East, Thrissur District, Kerala - 680308

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DEPARTMENT OF COMPUTER SCIENCE

VISION

"Be the very pinnacle of academic and research excellence in Computer Applications"

MISSION

As a department, we are committed to

- Achieve academic excellence in Computer Applications through innovative teaching and learning processes.
- To prepare the students to be professionally competent to face the challenges in the industry.
- Promote inter-disciplinary research among the faculty and the students to create state of art research facilities.
- To promote quality and ethics among the students.
- Motivate the students to acquire entrepreneurial skills to become global leaders.

Courses Offered

- BSc Computer Science
- BCA
- MSc Computer Science

2. Program Outcomes

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Citizenship ethics, and sustainability: Demonstrate empathetic social concern and equity centered national development. Guided by ethics. Promoting social, economic and environment sustainability.

PO4: Use of computer skills: Use the knowledge of computers and information technology for data acquisition and data analysis in experimental investigations and in communication.

PO5. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

4. Programme Specific Outcome

PSO1: Get familiar with the potentially rich and employable field of computer applications

PSO2: Become eligible for higher studies in the area of Computer Science/ Applications.

PSO3: Develop skills in software development to take up self-employment in Indian and global software market.

PSO4: Get trained and equipped with meeting the requirements of the software industry in the country and outside.

5. PSO-PO Mapping

	PSO1	PSO2	PSO3	PSO4
PO1.Critical Thinking	3	2	3	3
PO2.Effective Communication	3	2	3	2
PO3. Citizenship, ethics and Sustainability	3	3	3	1
PO4. Use of computer skills	2	2	3	3
PO5.Self-directed and Life-long Learning	1	2	2	2

5.Programme Structure

BACHELOR OF COMPUTER SCIENCE

(BSc CS)

(Choice Based Credit and Semester System for Under Graduate Curriculum 2019)

The basic objective of the Programme is to open a channel of admission for computing courses for students, who have done the 10+2 and are interested in taking computing/IT as a career. After acquiring the Bachelor's Degree (BSc CS) at University of Calicut, there is further educational opportunity to go for an MCA or other Master's Programme like MSc (Computer Science), MSc (IT), MBA, etc., at this university or at any other University/Institute. Also, after completing the BCA Programme, a student should be able to get an entry level job in the field of Information Technology or ITES or they can take up self-employment in the Indian & global software market. The specific objectives of the Programme include

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Duration: The duration of the BSc CS Programme shall be six semesters distributed over a period of three academic years. The odd semesters (1, 3, 5) shall be from June to October and the even Semesters (2, 4, 6) shall be from November to March. Each semester shall have 90 working days inclusive of all examinations. Courses: The UG programme shall include five types of courses, viz; Common Courses (Code A), Core courses (Code B), Complementary courses (Code C), Open Course (Code D) and Audit courses (Code E).

Add-on Courses (Code NCSAOC), Bridge Course (Code NCSBC) and Additional Certification Courses (Code NCSACC) are provided by the college in various semesters in addition to the university's insisted courses.

Credits(C): Each course shall have certain credits. A student is required to acquire a minimum of 140 credits for the completion of the UG programme, of which 120 credits are to be acquired from class room study and shall only be counted for SGPA and CGPA. Out of the 120 credits, 14 credits for common courses (English), 8 credits for additional language courses and 16 credits for General courses. The maximum credits for a course shall not exceed 5. Audit courses shall have 4 credits per course and a total of 16 credits in the entire programme. The maximum credit acquired under extra credit shall be 4. If more Extra credit activities are done by a student, it may be mentioned in the Grade card. The credits of audited courses or extra credits are not counted for SGPA or CGPA. 'Letter Grade" or simply Grade" (G): in a course is a letter symbol (O, A+, A, B+, B, C, P, F, I and Ab). Grade shall mean the prescribed alphabetical grade awarded to a student based on his/her performance in various examinations. Credit Point"(P) of a course is the value obtained by multiplying the grade point (G) by the credit (C) of the course: P=G x C. 'Extra Credit" is the additional credit awarded to a student over and above the minimum credits required in a programme, for achievements in co-curricular activities and social activities conducted outside the regular class hours, as decided by the University. For calculating CGPA, extra credits will not be considered.

Attendance: A student shall be permitted to appear for the semester examination, only if he/she secures not less than 75% attendance in each semester. Attendance shall be maintained by the Department concerned. Condonation of shortage of attendance to a maximum of 10% in the case of single condonation and 20% in the case of double condonation in a semester shall be granted by the University remitting the required fee. Benefits of attendance may be granted to students who attend the approved activities of the college/university with the prior concurrence of the Head of the institution. Participation in such activities may be treated as presence in lieu of their absence on production of participation/attendance certificate (within two weeks) in curricular/extracurricular activities (maximum 9 days in a semester). Students can avail of condonation of shortage of attendance in a maximum of four semesters during the entire programme (Either four single condonations or one double condonation and two single condonations during the entire programme). If a

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student fails to get 65% attendance, he/she can move to the next semester only if he/she acquires 50% attendance. In that case, a provisional registration is needed. Such students can appear for supplementary examinations for such semesters after the completion of the programme. Less than 50% attendance requires Readmission. Readmission is permitted only once during the entire programme. Strike off the roll: A student who is continuously absent for 14 days without sufficient reason and proper intimation to the Principal of the college shall be removed from the roll.

Ability Enhancement courses/Audit courses: These are courses which are mandatory for a programme but not counted for the calculation of SGPA or CGPA. There shall be one Audit course each in the first four semesters. These courses are not meant for classroom study. The students can attain only pass (Grade P) for these courses. At the end of each semester there shall be an examination conducted by the college from a pool of questions (Question Bank) set by the University. The students can also attain these credits through online courses like SWAYAM, MOOC etc. (optional). The list of passed students must be sent to the University from the colleges at least before the fifth semester examination.

Grace Marks: Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities (in Sports/Arts/ NSS/NCC/ Student Entrepreneurship) carried out besides the regular class hours. Such a benefit is applicable and limited to a maximum of 8 courses in an academic year spreading over two semesters. No credit shall be assigned for such activities. In addition, a maximum of 6 marks per semester can be awarded to the students of UG Programmes, for participating in the College Fitness Education Programme (COFE).

Project: Every student of a UG degree programme shall have to work on a project of 2 credits under the supervision of a faculty member or shall write a theory course based on Research Methodology as per the curriculum. College shall have the liberty to choose either of the above.

Extension Activities: Compulsory social service (CSS) for a period of 15 days is essential for the successful completion of the B.Sc. Computer Science Programme.

PROGRAMME STRUCTURE IN NIMIT

- The Bachelor of Computer Science programme will equip the students with the necessary knowledge and skills for the existing and emerging challenges that a career in computing and software technology will entail.
- In addition, it prepares graduates to show high quality of independent thought, flexibility and maturity based on a sound technical knowledge of the field.
- The Bachelor of Computer Science programme aims to provide graduates with the skills and methods needed to create new generations of software applications and to appreciate the technical basis on which they should be built.
- The emphasis throughout is on a thorough understanding of the foundations on which modern development rests, on the software life cycle and project control, on program specification and implementation, on modern software architectures and on human-computer interaction issues through Mathematical and Statistical concepts.
- After the successful completion of first year, the students will develop problem-solving strategies, techniques and skills that can be applied to computers and problems in other areas which give students an introduction to computer and analytical skills to use in their subsequent course work and professional development. Students will learn in detail about the mathematical foundations for various computer applications and discrete mathematics. Develop proficiency in C programming language. Develop fundamental ideas of Mathematical Logic. Develop data reduction techniques. Understand probability theory and random variables. Students will also accrue knowledge of various accounting principles and optimization techniques.
- In addition to the university syllabus, students will also learn "Basic Communication skills" and "MS Office". Students will also learn to develop Simple websites using HTML through Mini Projects.
- After the successful completion of second year, the students will be familiar with major algorithms and data structures such as balanced search trees, hash tables, priority queues etc. Be familiar with the role of project management including planning, scheduling, risk management, etc. Understand the approaches to verification and validation including static analysis, and reviews. Be proficient TOC and MY SQL Be able to interpret equations of lines and planes in space Expose the real-life applications of Probability distributions. Explain standard error and testing procedures for parameters of a normal population using large and small samples. Students will also be familiar with Python Programming Microprocessors, Data communication, Sensors and transducers.
- In addition to the university syllabus, students will also learn yoga, table manners, and Basic OOPs concepts. Students will also learn to develop simple Python applications, database design in real world organizations and Computer Graphics algorithms through Mini Projects.

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- After the successful completion of third year, the students will be proficient in Object Oriented Programming and Java programming, able to develop and manage a website, familiar with different operating systems, able to develop Android applications, able to develop quality software solution by following the software engineering principles and practices, able to understand, design, and analyze precise specifications of algorithms, procedures, and interaction behavior and experience of working in teams to build software systems.
- In addition to the university syllabus, students will also additional skills through add on courses, managerial and entrepreneurship skills, IPR, and cyber laws. Students will also learn to develop software /applications through their final year projects.
- Students will also develop their aptitude and technical interview skills.
- Students will also learn basics industrial practices and ethics through industrial visits and interactions.

Onwards

6. Semester wise Courses

Semester	Sl No	Course Type	Course Code	Course Description	Number of Hours
1	1	University Insisted Course	A01	Litmosphere: The World of Literature	72 (4hrs/wk)
	2		A02	Functional Grammar And Communication In English	90 (5hrs/wk)
	3		A07	Languages other than English	90 (5hrs/wk)
	4		BCS1B01	Computer Fundamentals & HTML	64 (4hrs/wk)
	5		XXXXC01	Complimentary course I	72 (4hrs/wk)
	6		XXXXC01	Complimentary course II	72 (4hrs/wk)
	7		Audit Course	Environment Studies	-
	7	Add-on Course	NCSAOC1	Communication Skills	30 hrs
	8	Bridge Course	NCSBC01	Mathematics	20 hrs
1 & 2	9	Additional Certification Course	NCSACC1	Basics Skill Enrichment Program	30 hrs
2	10	University Insisted Course	A03	Readings from the fringes	72 hrs.
	11		A04	Readings on Kerala	90 hrs.
	12		A08	Literature in Languages other than English	90 hrs

	13		BCS2B02	Problem Solving using C	64 hrs.
	14		BCS2B03	Programming Laboratory I: HTML and Programming in C	
	15		XXXXC02	Complementary Mathematics II	64 hrs.
	16		XXXXC02	Optional Complementary II	
	17		Audit Course	Environment Studies	
	18	Bridge Course	NCSBC02	Basics of C Programming	20 hrs.
	19	Additional Certification Course	NCSACC2	Advanced Excel	5 hrs.
3	20	University Insisted Course	A11	Python Programming	64 hrs.
	21		A12	Sensors and Transducers	64 hrs.
	22		BCS3B04	Data Structures using C	112 hrs.
	23		BCS3C05	Computer Oriented Numerical and Statistical Methods	80 hrs.
	24		XXXX C03	Complementary Mathematics III	80 hrs.
	25		XXXX C03	Optional Complementary III	80 hrs.
	26		Audit Course	Environment Studies	
	27	Add-on Course	NCSAOC2	STED Council- Python Programming	30 hrs.

3 & 4	28	Additional Certification Course	NCSACC3	Intermediate Skill Enrichment	30 hrs.
4	29	University Insisted Course	A13	Data Communication and Optical Fibers	64 hrs.
	30		A14	Microprocessors-Architecture and Programming	64 hrs.
	31		BCS4B05	Database Management System and RDBMS	112 hrs.
	32		BCS4B06	Programming Laboratory II: Data Structures and RDBMS	
	33		XXXXC04	Complementary Mathematics IV	
	34		XXXXC04	Optional Complementary IV	80 hrs.
	35		Audit Course	Environmental studies	
	36	Bridge Course	NCSBC03	Introduction to OOPs Concepts	
	37	Additional Certification Course	NCSACC4	Digital Marketing	5 hrs.
5	38	University Insisted Course	BCS5B07	Computer Organization and Architecture	64 hrs.
	39		BCS5B08	Java Programming	96 hrs.
	40		BCS5B09	Web Programming Using PHP	96 hrs.
	41		BCS5B10	Principles of Software Engineering	64 hrs.
	42		XXX5DXX	Open Course	48 hrs.

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	43	Add-on Course	NCSAOC3	STED Council - Introductory concepts of Digital Computing	30 hrs.
5 & 6	44	Additional Certification Course	NCSACC5	Advanced Skill Enrichment	30 hrs.
6	44	University Insisted Course	BCS6B11	Android Programming	80 hrs.
	45		BCS6B12	Operating Systems	80 hrs.
	46		BCS6B13	Computer Networks	80 hrs.
	47		BCS6B14	Programming Laboratory III: Java and PHP Programming	
	49		BCS6B15	Programming Laboratory IV: Android and Linux shell Programming	
	50		BCS6B16X	Elective Course- Software Testing	64 hrs.
	51		BCS6B17	Industrial Visit & Project Work	64 hrs.
	52	Additional Certification Course	NCSACC5	Introduction to Image Processing and Machine Learning	30 hrs.

7. Semester wise Activities

Semester	Sl No	Activity Code	Activity Type	Activity Details
1	1	NCSACT01	Ability test	Mathematics
	2	NCSACT02	Ability test	Basic Computer fundamentals
	3	NCSACT03	Mini Project	Computer Fundamentals & HTML
	4	NCSWWS01	WWS	Introduction to JavaScript
2	5	NCSACT04	Competition	PPT presentation on Recent Trends in IT
3	6	NCSACT05	Workshop	Introduction to system hardware
	7	NCSACT06	Mini Project	Python
	8	NCSACT07	Training	Aptitude Training
4	9	NCAWWS02	WWS	Research paper Writing
	10	NCSACT06	Industrial Interaction	Industry Ethics & Practices
	11	NCSACT07	Mini Project	Computer Graphics
	12	NCSACT08	Competition	Research paper review competition
5	13	NCSACT09	Training	Technical Interview preparation
	14	NCSACT10	Seminar	How to become an entrepreneur

	15	NCSACT11	Industrial Interaction	Getting ready for placements
6	16	NCSACT12	Workshop	Introduction to Manual & Automation testing
	17	NCSACT13	Industrial visit	Visit to an IT Industry

8. Detailed Syllabus of Courses with Course Outcomes, Course Objectives and CO-PO/PSO Mapping

Semester 1

ENG1A01– Litmosphere: The World of Literature
No. of sessions: 72

Course Objectives
1. To develop the ability to appreciate life and literature   2. To cultivate an interest in society and culture   3. To envisage creative approach to life and literature

Course Outcomes
CO1: Develop the qualities necessary to become good, kind and responsible human being   CO2: Attain confidence to ask questions   CO3: Apply logical and analytical skills in various situations   CO4: Understand and apply problem solving skills   CO5: Assimilate new perspectives on life   CO6: Enhance the ability to express themselves through writing

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CO-PO/PSO Mapping

PO → / CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	3	3	3	2	3	2	2	2
CO2	3	3	2	2	3	2	3	2	2
CO3	2	3	2	3	3	2	2	3	2
CO4	3	3	2	3	2	2	2	2	3
CO5	3	3	2	3	3	2	2	2	2
CO6	2	3	3	3	2	2	2	2	2

AIM OF THE COURSE:

This course aims to introduce the nature and types of literature to undergraduate students. This course is envisaged in such a way as to help students gain some insights into the art of creative thinking and writing and also to assist them in approaching literature in an analytical way. This eventually leads to develop the students' ability to understand various perspectives on life and literature. Another major purpose of the course is to familiarize the students with English language and literature so that they can appreciate and embrace the creative side of life too.

COURSE DESCRIPTION:

A. COURSE SUMMARY

Module 1: 14 hrs

Onwards

Module 2: 16 hrs

Module 3: 14 hrs

Module 4: 16 hrs

Evaluation: 12 hrs

Total: 72 hrs

B. COURSE DETAILS:

MODULE 1: Literature- Initiation

1. To Posterity (poem)- Louis MacNeice

2. The Rocking Horse Winner (Short Story) -D H Lawrence

3. "Memoirs of A Mad Man" (Prose excerpts from Autobiography) - Gustave Flaubert

MODULE 2: Creative Thinking and Writing

1. The Thought Fox (poem)-Ted Hughes

2. Poetry (poem)-Marianne Moore

3. Excerpt from An Autobiography (Prose)-Agatha Christie

4. Half a Day (Short story)-Naguib Mahfouz

MODULE 3: Critical Thinking

1. To a Reason (Poem)- Arthur Rimbaud

2. The Adventures of the Retired Colourman (Short Story) - Arthur Conan Doyle

3. Trifles (One-Act Play)-Susan Glaspe

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MODULE 4: Perspectives

1. Body Without the "d" (Poem)-Justice Ameer

2. Sleeping Fool (Poem)-Suniti Namjoshi

3. The Cockroach (Short Story)-Luis Fernando Verissimo; translated by Anna Vilner

4. About Dalit Literature" (Prose)- Sharankumar Limbale

5. Purl (Short Film)-Kristen Lester

READING LIST: CORE TEXT

CODE: ENG1A01

TITLE: LITMOSPHERE: THE WORLD OF LITERATURE

AUTHOR: BoS English (UG) University   of Calicut

PUBLISHER: University of Calicut

FURTHER READING:

Koshy, A V- A Treatise On Poetry for Beginners. CreateSpace Independent Publishing Platform, 2012

Rilke, Rainer Maria -Letters to a Young Poet. Yogi Impressions, 2003.

Esplugas, Celia & Landwehr, Margarete. "The Use of Critical Thinking Skills In Literary Analysis". Foreign Language Annals, 2008. 29. 449 - 461.10.1111/j.1944-9720.1996.tb01256.x.

LaPlante, Alice - The Making of a Story: A Norton Guide to Creative Writing. WW Norton, 2009.

Michael Michalko- Cracking Creativity. Ten Speed Press, 2001.

Onwards

ENG1A02: Functional Grammar And Communication In English

COURSE CODE	: A02
Title of the Course	**:** Functional Grammar and Communication in English
No. of Credits	: 3
No of contact hours	: 90(5 Hours/Week)

AIM OF THE COURSE:

This course aims at preparing undergraduate students to learn how to use the structure of language systematically and to get a good command over the language to produce the learned grammatical structures accurately. It aims to enable the learner to communicate effectively at the written and spoken level appropriately in real-life situations.

Course Objectives
1. To identify the key concepts of English grammar.
2. To describe the use of appropriate language through the understanding of the sentence patterns in English.
Course Outcomes
CO1: Demonstrate the ability to use the syntactic structures within English texts.

CO2: Distinguish logical and analytical skills in the use of language for communication.

CO3: Develop writing skills in various professional and career related situations

CO4: Formulate the basic skills in spoken communication in formal contexts

CO-PO/PSO Mapping

PO→ / CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	2	2	3	2	3	2
CO2	3	3	2	1	3	3	3	3	1
CO3	3	1	2	1	2	3	3	3	3
CO4	1	3	2	3	1	3	3	3	3
CO5									

COURSE DESCRIPTION:

A.   COURSE SUMMARY

Module 1: 26 hrs

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Module 2: 26 hrs

Module 3: 26 hrs

Evaluation: 12 hrs

Total: 90 hrs

B.   COURSE DETAILS:

Module1: Basic Concepts of Syntax

Word order and Sentence Patterns - Concord/ Subject-Verb Agreement - Types of Sentences based on Functions - Types of Sentences based on Clauses - Transformation of Sentences - Affirmative and Negative Sentences - Connectives- Collocations - Punctuations

Module 2: Basic Functional Aspects of Grammar

Use of major tense forms (Emphasis on tense forms in use in everyday transactions) – Use of Active and Passive Voice – Making use of Reported Speech – Use of functional elements in sentences – Articles – Prepositions.

Module 3: Skills for Communication

Aspects of Formal Communication – Barriers to Communication – Preparation for Minutes of Meeting – Writing of Memos - Emails – Letter writing – Writing Curriculum Vitae/Resume - Proposals and Statements of Purpose – Reviews - Case Studies – Group discussion – Presentation skills

READING LIST:

CORE TEXT: FUNCTIONAL GRAMMAR AND COMMUNICATIO N IN ENGLISH

CODE TITLE: ENG1A02

AUTHOR: BoS English (UG) University of Calicut

PUBLISHER: University of Calicut

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FURTHER READING:

Adair, John. Effective Communication. London: Pan Macmillan Ltd., 2003. Collins, Patrick. Speak with Power and Confidence. New York: Sterling, 2009.

Combleet. S and Carter, R The Language of Speech and writing London: Routledge. 2001. Dignen, Bob. Presentation Skills in English, Orion Printers, Hyderabad. 2007.

Guffey, Mary Ellen. Essentials of Business Writing. Ohio: South-Western College Pubg., 2000. Kroehnert, Gary. Basic Presentation Skills. Sidney: McGraw Hill, 2010.

Mohan Krishna and Meera Banerji. Developing Communication Skills 2nd Edition, Trinity Press Delhi. 2009.

Quirk R. & Sidney Greenbaum. A University Grammar of English. ELBS.

Shankar. R Communication Skills in English Language ABD Publishers, New Delhi. 2011. Swan, Michael. Practical English Usage. Oxford University Press, 2005.

Thomson, A. J. and Martinet. A Practical English Grammar Combined Exercises Vol. 1 & 2. Oxford University Press.

Wallace, Michael. Study Skills in English. London: Cambridge University Press. 1988

MAL1A07(3) Malayalabhashayum Sahithyavum-1

No. of sessions: 80

Course Objectives
1. Implant an interest in Science and literature in students of conventional graduate courses.

2. Make the students to prepare Science essays and studies in Mother tongue.
3. Improve the communication skills and the taste for creative writing.
Course Outcomes
CO1: Inculcate an interest in Mother tongue and regional literature thereby improve their cultural development
CO2: Improve the language skills.
CO3: Familiarize with Malayalam literature and the stylistic use of language in various periods.
CO4: Improve the basic grammatical structure of language use of students.
CO5: Familiarise with different and varied cultural realms of Kerala culture.

CO-PO/PSO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	3	2	0	1	0	2	3	3	2	2	1	0
CO2	2	2	2	3	1	3	2	3	1	1	2	2
CO3	3	1	2	0	2	2	2	1	1	2	1	2
CO4	2	2	2	1	2	2	3	2	2	1	2	3
CO5	1	2	2	3	1	2	1	1	3	1	2	2

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Course Description

Module 1: Essays
Kalayum Avishkaravum-Nithyachaithanya Yathi,
Njangal Ningalkku Bhoomi Vittal-Siyatil Moopan,
Kandal Jeevitham-Pokkudan

Module 2: Stories
Bonsayikal –Kovilan,
Lola enna American Penkidavu-Pathmarajan,
Vismayachihnangal-Ashitha

Module 3: Travelogue
Kappirikalude Nattil – S K Pottekkattu

Module 4: Poems
Budhanum Njanum Nariyum-Idassery,
Kollendathengane-Sugathakumari,
Meera Padunnu-Sachidanandan,
Pala posilulla Photokal-K G S

HIN 1A 07(3)

No. of sessions: 90

Course Objectives
1. To Acquaint the students with different forms of thoughts and styles used in Hindi prose writing ,to make them express their thoughts in these different forms.
2. To Introduce Hindi one act plays to the students for appreciation and critical analysis.
3. To Help them to develop their creative thinking and writing .
Course Outcomes

CO1: Approach literary texts in terms of genre, gender and the canon
CO2: Understand and use academic conventions: referencing and bibliography.
CO3: The learner will be aware of socio-political and economic conditions of the society from different periods .
CO4: Be familiar with the theoretical foundations of the genre;
CO5: Be able to compare and contrast the genre with other dramatic forms;

CO-PO/PSO Mapping

PO → CO ↓	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	2	0	2	0	1	2	1	1
CO2	2	2	0	2	0	1	1	2	1
CO3	2	2	0	2	0	1	2	1	1
CO4	2	2	0	1	0	1	1	2	1
CO5	2	2	0	1	0	1	2	1	1

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Course Description

Module 1

Selected prose –

1. Ramvriksh Benipuri – Subhan Khan
2. Hazariprasad Dwivedi – Bheeshm ko kshama nahin kiya gaya
3. .Harishankar Parsaee – Trishanku Bechaara
4. Mohan Rakesh – Yatra ka Romance

Module 2

One act plays

1. Mamta Kaliya – Jan se pyare
2. Vinod Rastogee – Bahu kee vida

Module 3

3. Swadesh Deepak – Shadee kee Bath
4. Omprakash Aditya-Rehearsal

COMMUNICATIVE SKILLS IN FRENCH FRE 1A07(1/2)

Course objective: Introduce students to French language, pronunciation, basic communication skills, and writing simple sentences and compositions, enabling effective communication and interaction in everyday situations.

CO1: To familiarise the students with a modern foreign language.
CO2: To familiarise the students with the sounds of French and their symbols.
CO3. To familiarise students with French for basic communication and functions in everyday situations.
CO4.To familiarise students with the basics of writing simple, direct sentences and short compositions.

CO-PO-PSO MAPPING

PO/PSO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4

CO1	1	2	0	0	1	1	1	1
CO2	0	1	0	0	0	0	1	1
CO3	0	2	0	1	0	0	1	2
CO4	1	2	0	00	1	1	1	1

Course Outline: 4 Modules

1. Module I: Current trends in French pronunciation, grammar, lexical

items, discourse models-oral and written.

2. Module II: Literary communication literary passages, versification,

lyrics and music.

3. Module III: Communication skills in everyday conversation.

4. Module IV: Training in creative writing.

TEXTBOOK: 'Echo A 1: Methode de francais' - (Lessons 0-3, Pages 1st to 29)

BCS1B01 – Computer Fundamentals and HTML
No. of sessions: 64

Course Objectives
1. To equip the students with fundamentals of Computer

2.To learn the basics of Computer organization of personal and professional contexts.
3.To equip the students to write algorithm and draw flow chart for solving simple problems
4.To learn the basics of Internet and webpage design

Course Outcomes
CO1:Identify and understand the basics of computer organization and gain functional knowledge of the hardware used in computers and how a software is being executed in a computer
CO2: Explain and apply the basic concepts of number systems and the use of Binary, Decimal and Hexadecimal number systems, and demonstrate competence in the conversion of numbers from one representation to another.
CO3: Demonstrate familiarity with Boolean Operations, the Laws of Boolean Algebra, DE Morgan Theorems and the application of Boolean Algebra and Karnaugh Maps to simplify logic circuits.
CO4: Develop problem-solving strategies,Algorithms and Flowcharts that can be applied to computers and problems in other areas which give students an introduction to computer and analytical skills to use in their subsequent course work and professional development.
CO5: Enable students to understand the internet and develop web page creation using basic HTML Tags and Student will be able to create web pages with different styles and formats.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	0	1	3	1	3	3	2	2
CO2	1	0	0	1	0	0	1	1	1
CO3	1	0	0	1	0	0	1	1	0

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CO4	3	1	2	2	3	3	3	3	2
CO5	3	1	2	3	3	3	3	3	3

Course Description

Unit I

Concepts of Hardware and Software: Computer Languages, Language Translators, Features of good language, Basics Computer Organization: Von Neumann Model, Input Unit, Output Unit, Storage Unit, Control Unit, Memory Hierarchy, Primary Storage, Cache Memory, Registers, Secondary Storage Devices, Basics of Hardware Components – SMPS, Motherboard, Add-on Cards, Ports, Memory, Adapters, Network cables, Basic Computer Configuration

Unit II

Number Systems and Boolean Algebra – Decimal, Binary, Octal and Hexadecimal Numbers, Arithmetic involving Number Systems, Inter Conversions of Number Systems, 1's and 2's Complements, Complement Subtractions, Digital Codes – Binary Coded Decimal (BCD), ASCII Code, Unicode, Gray Code, Excess-3 Code. Boolean Algebra: Boolean Operations, Logic Expressions, Postulates, Rules and Laws of Boolean Algebra, DeMorgan's Theorem, Minterms, Maxterms, SOP and POS form of Boolean Expressions for Gate Network, Simplification of Boolean Expressions using Boolean Algebra and Karnaugh Map Techniques (up to 4 variables)

Unit III

Fundamentals of Problem Solving – The Problem Solving Aspect, Top-down Design, Definition – Algorithm, Flowchart, Program - Properties of Flowcharts – Flowchart Symbols for Designing Application Programs, Sample Algorithms – Sum, Average, Finding Smallest Number, Checking Odd/Even Number, Prime Number, Quadratic Equation

Unit IV

Basics of Web Design – www, W3C, Web Browser, Web Server, Web Hosting, Web Pages, DNS, URL,

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Introduction to HTML, XHTML, DHTML, HTTP. Overview of HTML 5 – Basic Formatting Tags: heading, paragraph, break, underline, bold, italic, superscript, subscript, font and image, attributes: align, color, bgcolor, font face, border, size, navigation links using anchor tag: internal, external, mail and image, lists: ordered, unordered and definition, HTML media tags: audio and video

Unit V

Creating Simple Tables: row, col, heading, cell, border, spanning – Form Controls: Input types – text, password, text area, button, checkbox, radio button, select box, hidden controls, frames and frame sets CSS: Introduction - Concept of CSS, Creating Style Sheet: inline and internal, CSS Properties, CSS Styling: Background, Text Format, Controlling Fonts - Working with Block Elements and Objects, CSS ID and Class.

MTS1C01: MATHEMATICS-1

No. of sessions: 64

Course Objectives
1. To learn application of derivatives
2. To learn more about application of integration
Course Outcomes
CO1: To learn the application of the derivative and integration.
CO2: To explain the notion of continuity as related to functions. You should be able to relate an intuitive notion of continuity to the mathematical definition of continuity
CO3: To demonstrate integral representing the volume of a solid of revolution about a coordinate axis, given the formulas for solids of revolution.

CO4: To explain asymptotes in terms of graphical behavior

CO5: To demonstrate the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of a rate of change and should be able to use integrals to solve a variety of problems.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1	0	1	1	1	1	2	1
CO2	2	1	0	1	1	2	2	1	0
CO3	1	0	1	1	0	1	1	1	1
CO4	1	0	1	0	1	2	0	2	0
CO5	1	0	1	0	1	1	2	2	1

Module I - 14 hrs.

1.1: Introduction to the derivative-instantaneous velocity, slope of tangent line, differentiating simplest functions 1.2: Limits- Notion of limit, basic properties, derived properties, continuity, continuity of rational functions, one sided limit, limit involving ±∞ 1.3: The derivative as Limit- formal definition, examples, differentiability and continuity, Leibnitz notation, 1.4: Differentiating Polynomials-power rule, sum rule etc., 1.5: Product and quotients- product, quotient, reciprocal & integral power rule 1.6: Linear Approximation and Tangent Lines- equation of tangent line and linear approximation, illustrations .

Module II - 13 hrs.

2.1: Rate of change and Second derivative- linear or proportional change, rates of change, second derivative, 2.2: The Chain Rule- power of a function rule, chain rule, 2.3: Fractional Power & Implicit Differentiation-rational power of a function rule, implicit differentiation 2.4: Related rates and parametric curves- Related rates, parametric curves, word problems involving related rates 2.5: Anti derivatives- anti differentiation and indefinite integrals, anti-differentiation rules 81.

Module III - 18 hrs.

3.1: Continuity and Intermediate value theorem-IVT: first and second version 3.2: Increasing and decreasing function- Increasing and decreasing test, critical point test, first derivative test 3.3: Second derivative and concavity- second derivative test for local maxima , minima and concavity , inflection points 3.4: Drawing of Graphs- graphing procedure, asymptotic behaviour 3.5: Maximum- Minimum Problems- maximum and minimum values on intervals, extreme value theorem, closed interval test, word problems 3.6: The Mean Value Theorem- The MVT, consequences of MVT-Rolles Theorem, horserace theorem 11.2: L'Hospital rule-Preliminary version, strengthened version.

Module IV - 19 hrs.

4.1: Summation- summation, distance and velocity, properties of summation, telescoping sum (quick introduction- relevant ideas only) 4.2: Sums and Areas-step functions, area under graph and its counterpart in distance-velocity problem 4.3: The definition of Integral- signed area (The counterpart of signed area for our distance-velocity problem), The integral, Riemann sums 4.4: The Fundamental Theorem of Calculus-Arriving at FTC intuitively using distance velocity problem, Fundamental integration Method, proof of FTC, Area under graph, displacements and velocity 4.5: Definite and Indefinite integral-indefinite integral test, properties of definite integral, fundamental theorem of calculus: alternative version (interpretation and explanation in terms of areas) 4.6: Applications of the Integral- Area between graphs, area between

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intersecting graphs, total changes from rates of change, 9.1: Volume by slice method- the slice method, volume of solid of revolution by Disk method 829.3: Average Values and the Mean Value Theorem for Integrals- motivation and definition of average value, illustration, geometric and physical interpretation, the Mean Value Theorem for Integrals.

ELE1C01 - Electronic Devices

Number of Contact Hours: 45 Hrs.

Course Objectives
1. To learn the basics of electronic components
2. To learn the basics of testing and measuring instruments
3. To learn the circuit assembling
4. To study circuit troubleshooting
Course Outcomes
CO1: To understand basic knowledge of electronics components and its operations
CO2: Enable students to understand the PCB how to create for different applications
CO3: To understand the fundamentals of electronics and basic diode operations
CO4: students able to identify different diode and its working and applications

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CO5: To understand Transistor operations and applications in real life

CO6: :Identify and understand the basics of different types of transistors

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	2	0	1	2	0	2
CO2	1	2	2	0	1	2	0	2	2
CO3	2	2	0	1	2	0	2	2	1
CO4	0	1	2	0	2	2	1	2	2
CO5	1	2	0	2	2	1	2	2	0
CO6	0	2	1	2	2	2	1	0	2

Course Description

Module I

Introduction to electronics: Components - passive and active components- Resistors, capacitors, inductors types-identification-colour coding. Circuit control and protective devices- switches, fuses and relays, Printed Circuit Board

Module II

Fundamentals of electronics – Band theory, conductors, insulators, semiconductors. Intrinsic and extrinsic semiconductors, PN junction, diode, biasing and characteristics, breakdown, diode resistance and capacitance, switching diode, Zener diode

Module III

Structure and operation of LDR, Photovoltaic cell, Photo diode, LED and LCD.

Module IV

Bipolar junction transistor, operation, transistor configurations, characteristics and their comparison, current transfer ratio, transistor as a switch.

Module V

FET, structure, characteristics, parameter terminal current, transconductance model, comparison between BJT and FET, applications, MOSFET, types and characteristics, UJT.

NCSBC01-Bridge Course-Mathematics
Description:

The bridge course aims to act as a buffer for the new entrants with an objective to provide adequate time for the transition to hardcore of degree courses. The syllabus for the course is framed in such a way that they get basic knowledge on the subjects which they would be learning through graduation. The course consist of 30 hours of interactive sessions.

Course Objectives
1. To provide students the confidence and skills to successfully transition to new system
Course Outcomes
CO1: To define the basic concepts in mathematics

CO2: To develop academic skills and assist the students in mathematics.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

Course Description

Unit I

Limits and continuity- Properties of limits-infinite limits-continuity of functions

Unit II

Trigonometric functions: Laws of trigonometric functions-Identities

Unit III

Derivatives- formulas - rules of derivatives- substitution method-chain rule-exponential method

Unit IV

Integration: Formulas-Rules of integration-Application of integration

Unit V

Linear equations: Solution of linear equations Introduction of matrices

NCSACT02-Ability Test - Basic Computer fundamentals

Description –

This test has been designed to assess the ability of a candidate to work using a computer. It tests if an individual is aware of the functions in a computer including basic hardware and computer fundamentals. The test uses different difficulty levels of questions to accurately identify candidates who understand computer fundamentals.

Course Objectives
1. Understand the basic hardware and software functionalities.
Course Outcomes
CO1: Define the basic concepts computer fundamentals.
CO2: Will be able to understand the common hardware units.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

NCSACT03-Mini Project-Computer Fundamentals & HTML

Description: It enables the candidate to create a web page using HTML and can also be able to customize an existing web template which is available online. HTML can be used to create the web pages which are available on the web.

Course Objectives
1. To understand the real time software development environment. The student can gain a thorough knowledge in developing a web page using basic HTML tags.
2. Introduces stylesheets (CSS) and responsive (mobile) web design.

Course Outcomes
CO1: Use knowledge of HTML and CSS code and an HTML editor to create personal websites following current professional standards.
CO2: Use critical thinking skills to design and create websites.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

NCSWWS01-Walk with the scholar: Introduction to JavaScript

Description: The scheme originally introduced the idea of mentoring, building on the concept of mentor as a "Guide and Friend". The outcome of the programme indicated positive changes in the student participants such as increased self-confidence, improved communication skills, better academic performance, increased awareness regarding higher studies and career options in one's academic field and improved interpersonal functioning. The selection of the students was based on screening of their Marks, Interests, Potentials and Capabilities.

Course Objectives
1. To help the students to identify a better career option.

Course Outcomes
CO1: To develop certain generic skills, non-technical competencies, attitudes and behaviours.
CO2:.To provide necessary orientation, guidance ,motivation and support to enrich and nourish their talents.

Introduction, Client-side programming, script tag, comments, variables.

Including JavaScript in HTML, Data types, Operators, Conditional Statements, Loops, break and continue. Functions and Objects.

AUD1E01 ENVIRONMENTAL STUDIES

Course Objective

The study aims at imparting basic knowledge about the environment and its allied problems and acquiring an environmentally conscious mindset.

Course Outcomes:

- Comprehend the importance of ecosystem and biodiversity
- To correlate the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention Identify different types of environmental pollution and control measures
- To correlate the exploitation and utilization of conventional and non-conventional resources

Syllabus

Module 1:

Introduction – Environment in the Indian context: Concept of an ecosystem, Multidisciplinary nature of environmental studies. Components of environment- Atmosphere, hydrosphere, lithosphere and biosphere. Definition, scope and importance. Concept of sustainability and sustainable development.

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Module 2:

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. carbon footprint, water conservation, rain water harvesting, watershed management

Module 3:

Structure and function of an ecosystem. • Producers, consumers and decomposers. • Energy flow in the ecosystem. • Ecological succession. • Food chains, food webs and ecological pyramids. • Introduction, types, characteristic features, structure and function of the following ecosystem: - a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Module 4:

Biodiversity and its conservation • Introduction – Definition: genetic, species and ecosystem diversity. • Biogeographical classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels. • Hot-spots of biodiversity. • Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. • Endangered and endemic species of India • Conservation of biodiversity

Module 5:

Environmental Pollution Definition • Cause, effects and control measures of: - a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. nuclear hazards • Solid waste Management: Causes, effects and control measures of urban and industrial wastes. • Role of an individual in prevention of pollution.

Module 6:

Environmental Policies and practices: Climate change, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents.

Essential Reading

1. Bharucha Erach, The Biodiversity of India, Maupin Publishing Pvt. Ltd., Ahmedabad –

380 013, India, Email:mapin@icenet.net (R) c)

2. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p

3. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

4. Gadgil, M., & Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of

California Press.

3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.

4. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the

Twentieth Century.

5. Singh, J. S., Singh, S. P. and Gupta, S. R. 2014. Ecology, Environmental Science and

Conservation. S. Chand Publishing, New Delhi.

Subject Name: Basic Skills Enrichment Syllabus Code: BSE

Subject Code: SEP 01 Total: 5 Hours

Program Objective:

To make the students aware of themselves, their environment, about the challenges and to equip them with the basic communication and technical skills, along with practical training sessions.

Module 1: Effective Communication (LSRW) (5 hrs.)

Session 1: Orientation Class - Familiarize with language lab - do's and don'ts, introduce Tell Me More Software and its applications, discuss the syllabus.

Session 2: Listening Skill - Listen and draw, word search and crossword puzzle, video & questions.

Session 3: Speaking Skill - I have never, continue the story, and describe the image.

Session 4: Reading Skill - Reading comprehension, word jumble race, sentence pronunciation, Word scramble.

Session 5: Writing Skill - Written expression, fill in the blanks, sentence practice and grammar practice, write story.

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Semester II

ENG2A03 – Readings from the fringes

No. of hours: 72 hrs.

Aim of the Course:

This course aims to make the student understand the gender inequality, marginalization, disability studies, racism and casteism in our society. Though this engagement has been part of literary academic analysis, it has just begun making its foray into the syllabus of English departments of Indian universities. This paper hopes to introduce undergraduate students to perspectives within literatures that acquaint them with both experiences of marginalization, as well as the examination of modes of literary stylistics that offer a variation from conventional practice.

Course Objectives
1. To inculcate and apply the concepts of democracy and freedom in life and understand the basic tenets of our constitution 2. To critically think and examine various social issues prevailing in our society
Course Outcomes
CO1: Discuss and contemplate on the areas of gender inequality, marginalization, disability studies, racism and casteism CO2: Develop sensitivity towards environmental concerns and feel responsible towards protecting nature. CO3: Understand the everyday realities of the marginalized sections of the society and negate the stereotypes surrounding them and accept them as allies. CO4: To develop scientific temper and scientific thinking

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	1	2	1	1	1	1
CO2	1	3	1	1	2	1	1	1	0
CO3	2	2	1	1	1	0	1	1	0
CO4	2	2	1	2	3	1	1	0	0

COURSE DESCRIPTION:

A. COURSE SUMMARY

Module 1: 15 hrs

Module 2: 15 hrs

Module 3: 15 hrs

Module 4: 15 hrs

Evaluation: 12 hrs

Total: 72 hrs

B. COURSE DETAILS:

Module 1: Constitution, Democracy and Freedom

1.   "The Objectives Resolution"(Speech excerpt)- Jawaharlal Nehru

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2.   "How Many More Days, Democracy"(Poem) - Sameer Tanti

3.   "When Salihan took on the Raj"(Article) - P. Sainath

Module 2: Ecology and Science

1.   "Knowledge is Power"(Excerpt from Chapter 14 of Sapiens: A Brief History of Humankind)- Yuval Noah Harari

2.   "A White Heron"(Short story) - Sarah Orne Jewett

3.   "The Fish"(poem) - Elizabeth Bishop

4.   "Everything I Need to Know I Learned in the Forest"(essay) - Vandana Shiva

Module 3: Gender Equality

1.   "Fire" - Nikita Gill - Poem

2.   "Accept Me" from I am Vidya: A Transgender's Journey - Living Smile Vidya

3.   Dear Ijeawele (Letter-excerpt) - Chimamanda Ngozi Adichie

Module 4: Human Rights

1.   "Entre-vous to Adulthood" from One Little Finger - Malini Chib

2.   "The Body Politic" (Poem) - Hiromi Goto

3.   "Love- lines in the time of Chathurvarna" (Article) - Chandra Bhan Prasad

4.   "The History Lesson "(Poem) - Jeanette Armstrong

READING LIST:

CORE TEXT: Readings from the Fringes

CODE TITLE   AUTHOR   PUBLISHER

ENG2A03   BoS (UG) University of Calicut   University of Calicut

FURTHER READING:

Ambedkar, B. R. Annihilation of Caste: An undelivered Speech. New Delhi: Arnold Publishers, 1990.

Adichie, Chimamanda Ngozi. We Should all be Feminists. New York: Anchor Books, 2015.

Shiva, Vandana. Water Wars: Privatization, Pollution and Profit. Cambridge: South End Press, 2002.

Fanon, Frantz. Black Skin, White Masks. London: Pluto, 2008.

Gearty, Conor. Can Human Rights Survive? Cambridge: Cambridge UP, 2006.

Girma, Haben. Haben: The Deafblind Woman Who Conquered Harvard Law. New York: Twelve, 2019.

ENG2A04 – Readings On Kerala

No. of hours: 90 hrs.

Aim of the Course:

This course aims to give an overview of Malayalam literature and provides a detailed understanding of the cultural and historical tradition of the society and the development of literary sensibility. The course also provides a detailed analysis of the evolution of Malayalam literature through various genres.

Course Objectives
1. To enable the students to read and critically appreciate the different varieties of Kerala literature, writings and films

2. To read and understand the diversity of Malayalam literature and understand its distinctions

Course Outcomes

CO1: Develop critical understanding of literature of Kerala

CO2: Interrelate the cultural and historical tradition of the society and the development of literary sensibility

CO3: Identity the diversity of literary endeavours and the cultural representations

CO4: Identify and apply the insights and values in everyday life as a Keralite

CO5: Critically analyse and interpret the present cultural production

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	1	2	1	0	1	0
CO2	1	1	2	1	3	1	0	1	1
CO3	3	2	3	1	3	1	0	1	1
CO4	3	2	3	1	1	1	1	1	1
CO5	2	2	3	1	1	0	1	1	1

COURSE DESCRIPTION:

A.   COURSE SUMMARY:

Module 1: Formation 15 hrs.

Module 2: Evolution   22 hrs.

Module 3: Stimulation   16 hrs.

Module 4: Propagation   25 hrs.

Evaluation   12 hrs.

Total 90 hrs.

B.   COURSE DETAILS:

Module 1: Formation

1.   "History" (Prose) excerpt from Malabar Manual – William Logan

2.   "Tribal Tale of Kerala" (Prose) excerpt from Kerala Culture – Prof S Achutha Warrier

3.   "Ghoshayatra" (Poem excerpt) – Kunchan Nambiar

Module 2: Evolution

1.   Excerpt from Indulekha (Novel) -O. Chandu Menon

2.   Excerpt from "Atmopadeshashathakam" (Poem) - Sree Narayana Guru

3.   "Not an Alphabet in Sight" (Poem) – Poykayil Appachan

4.   " Ayyankali: A Dalit Leader of Organic Protest" (Prose-excerpt) -

M. Nisar,Meena Kandasamy

5.   "Vakkom Moulavi: My Grandfather, the Rebel" (Prose) - Sabin Iqbal

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Module 3: Stimulation

1.   "Daughter of Humanity" (Story) - Lalithambika Antharjanam

2.   "Kuttippuram Paalam"(Poem) – Edasseri

3.   "Christian Heritage" (Story) - Vaikom Muhammad Basheer

Module 4: Propagation

1.   "Myth and Literature" (Speech) -M T Vasudhevan Nair

2.   "Rain at Heart" (Poem) –Sugathakumari

3.   "Fifty years of Malayalam Cinema" (Prose) - VC Harris

4.   "Malayalam's Ghazal" (Poem) – Jeet Thayil

5.   "Agni" (Story) - Sithara A

6.   "Pictures Drawn on Water" (poem) - K.Satchidanandan

READING LIST:

CORE TEXT: Readings on Kerala

CODE TITLE   AUTHOR   PUBLISHER

ENG2A04   BoS English (UG), University of Calicut   University of Calicut

Further reading:

Logan, William. Malabar Manual. New Delhi: Low Price Publications, 2009 Prasad, Muni Narayana.
Narayana Guru: Complete Works. New Delhi: NBT, 2006

Appachan, Poykayil. Poykayil Appachante Paatukal (Unknown Subjects: Songs of Poykayil Appachan).
Tiruvalla: IPRDS Eraviperur, 2008

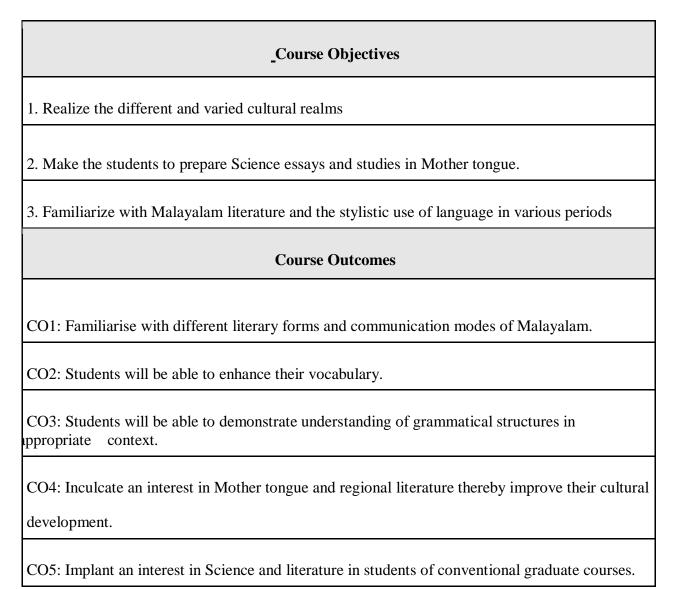Antherjanam, Lalithambika. Cast Me Out If You Will. Calcutta: Stree, 1998

48

Tharakan K M (Ed.). Malayalam Poetry Today. Thrissur: Kerala Sahitya Akademi, 1984 Abdulla, V, Asher, R E (Ed.). Wind Flowers. New Delhi: Penguin, 2004

MAL2A08(3) Malayalabhashayum Sahithyavum-2

No. of sessions: 80 hrs.

Course Objectives
1. Realize the different and varied cultural realms
2. Make the students to prepare Science essays and studies in Mother tongue.
3. Familiarize with Malayalam literature and the stylistic use of language in various periods
Course Outcomes
CO1: Familiarise with different literary forms and communication modes of Malayalam.
CO2: Students will be able to enhance their vocabulary.
CO3: Students will be able to demonstrate understanding of grammatical structures in appropriate   context.
CO4: Inculcate an interest in Mother tongue and regional literature thereby improve their cultural development.
CO5: Implant an interest in Science and literature in students of conventional graduate courses.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	3	0	2	1	3	2	1	0
CO2	2	2	1	3	1	2	1	3	2
CO3	2	1	3	0	2	1	2	1	2
CO4	2	2	1	1	2	2	1	2	3
CO5	1	2	3	3	1	3	2	2	2

COURSE DETAILS:

Module 1: Stories

Oru manushyan-Basheer,

Vanmarangal veezhumpol-N S

Madhavan,Payaru vallikalil ini nammalokke-Priya A S

Module 2: Novel

Enmagaje-Ambika Suthan Mangad

Module 3: Drama

Bhagnabhavanam-N Krishnapillai

Module 4: Autobiography, Memoire

Pavam manushyan - Cherukadu (Jeevithappatha)

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Santhanagopalam -M N Palooru (Kadhayillathavante Kadha)

Ulsavakalam – Chandramathi (Njandukalude nattil oridavela)

HIN2A08(3) Poetry and Short Stories
No. of sessions: 80 hrs.

Course Objectives
1. Appreciation of literature using the best specimens provided as reading list
2. Understanding literary works as cultural and communicative events.
3. Understanding different periods and movements ; literature and society.
Course Outcomes
CO1: Understand the common techniques underlying free verse and traditional forms of poetry
CO2: Identify personal experiences that can be used when writing poems
CO3: Understand the basic terminology and practical elements of poetry.
CO4: Students get to know various cultures and construction of gender, nation and race throughout the history.
CO5: The prescribed fiction helps the students to learn human values and the behavioral patterns from great works of art, and develops the ability to understand human race.

CO-PO/PSO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	0	2	1	3	2	1	3	2	1	0
CO2	2	2	1	3	1	2	2	3	2	1	3	2
CO3	2	1	3	0	2	2	1	1	1	2	1	2
CO4	2	2	1	1	2	2	2	2	2	1	2	3
CO5	1	2	3	3	1	2	2	2	3	2	2	2

Module 1

1 Kabir – 5 Dohas

2.Rahim – 5 Dohas

3.Meera Bai – one pada

4.Jayashankar Prasad –Madhumaya Desh

Module 2

5.Kedarnath singh—Akal mein doob

6 Sarveswar Dayal Saksena –Mukti kee Akanksha

7.Mahendra Bhatnagar –Nayee Naari

8.Gyanendrapathi -Pyasaa Kuan

Module 3

Premchand - Bade Ghar kee Beti

Yashpal – Aadmi Ka Bacha

Module 4

Bheeshm Sahni - Chief kee Dawat Madhukankariya – File

TRANSLATION AND COMMUNICATION IN FRENCH FRE 2A08(2)

Course objective: Improve language skills, learn about culture, and analyze translated texts. By doing this, students will become better at understanding and using the language.

CO1: To ameliorate the level of language proficiency.
CO2: To inculcate the cultural aspect of the region.
CO3: To analyze & evaluate other translated texts.

CO-PO-PSO MAPPING

PO/PSO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	0	2	0	0	0	0	1	1
CO2	1	1	1	0	0	0	1	1
CO3	0	1	0	0	0	0	1	1

Course Outline: 4 Modules

1. Module I: Translation as Communication, translation as transmission, social and cultural factors.

2. Module II: Literary translation, commercial translation from source language to target language and vice-versa.

3. Module III: Analysis of translated texts, treatment of technical terminology in the translated texts. General principles for the translation of key words and culture-specific terms.

4. Module IV: Business translation, translation of advertisements.

TEXTBOOK : La correspondence commerciale francais (Lessons in pages 1to39)

by L.Bas / C.Driot-Hesnard, Nathan, Paris.

BCS2B02– Problem Solving using C
 No. of sessions: 64 hrs.

Course Objectives
1. To equip the students with fundamental principles of Problem Solving aspects.
2.To learn the concept of programming
3.To study C language
4.To equip the students to write programs for solving simple computing problems
Course Outcomes
CO1: Identify and understand the basics of C program structure ,Familiarization of IDE, Tokens, Variable Declaration and how to define symbolic constant.
CO2: Explain and apply the basic concepts of operators and Expressions, Type conversions and operator precedence and associativity.

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CO3: Demonstrate familiarity with control structures such as branching, loops and expressions and simple programs
CO4: Develop the ability to create and use functions and to create arrays of elementary objects as well as equip with the basic concepts of Structures and Union and analytical skills to use in their subsequent coursework and professional development
CO5: Enable students to understand the creation and processing of files and command line operations. Student will be able to develop programs and understand a defensive programming concept as well as equip the ability to handle possible errors during program execution.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	3	3	2	3	3	2
CO2	3	0	1	2	1	1	1	1	1
CO3	3	2	2	2	2	3	2	3	3
CO4	3	2	3	2	3	3	2	3	3
CO5	3	2	3	3	3	3	3	3	3

COURSE DETAILS:

Unit I

Introduction to C Programming - Overview and Importance of C, C Program Structure, Sample programs. Familiarization of Integrated Development Environment - Invoking IDE, Opening a new window in IDE, Writing, Saving and Compiling a C program, making an Executable File. Elements of C Language and Program Constructs: Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable Declaration and Assignment of Values, Symbolic Constant Definition.

Unit II

C Operators - Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations - Library functions.

Unit III Data input output functions - Simple C programs – Flow of Control - Decision making with if statement, simple if statement, if-else statement, Nesting of If-else and else-if Ladder, Switch statement, Conditional operator, goto statement. Looping - While loop, Do-While, and For Loops, Nesting of loops, jumps in loop, skipping of loops.

Unit IV

Arrays and Strings - One dimensional array, two dimensional and multi-dimensional arrays, strings and string manipulation functions. The Concept of modularization and User defined functions - Definition - Multifunction Program, proto-types, passing arguments, calling functions, various categories of functions, Nesting of functions and recursion, functions and arrays, scope and lifetime of variables in functions, multi-file programs. Structures & Union structure definition - giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit fields.

Unit V

Pointers - Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer dynamic memory allocation. Files: Creating, Processing, Opening and Closing a data file, command line operations

MTS2 C02: MATHEMATICS-11
No. of sessions: 64

Course Objectives
1. To learn matrices and its applications
2. To learn more about convergence and divergence of sequences & series
Course Outcomes
CO1: To Understand the meaning of polar curves and their graphing, demonstrating comprehension of the principles behind polar coordinate systems and their graphical representation.
CO2: To Explain the derivatives and integration of hyperbolic functions, interpreting the concepts and operations involved in calculus with hyperbolic functions.
CO3: Apply the understanding of improper integrals and their applications, as well as comprehend diagonalization and L-U factorization of matrices, demonstrating the practical application of integration techniques and matrix operations
CO4: Apply the understanding of power series and their applications, showcasing the practical application of mathematical concepts in solving problems involving power series.
CO5: Understand the meaning of vector spaces and subspaces with examples, interpreting the foundational concepts of linear algebra and their application in real-world examples

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

CO1	1	1	0	1	1	1	1	2	0
CO2	1	1	0	1	0	1	2	1	0
CO3	1	0	1	1	1	1	1	1	1
CO4	1	0	1	0	1	2	0	1	1
CO5	1	0	1	0	1	1	2	1	0

COURSE DETAILS:

Module I

5.1: Polar coordinates and Trigonometry – Cartesian and polar coordinates (Only representation of points in polar coordinates, relationship between Cartesian and polar coordinates, converting from one system to another and regions represented by inequalities in polar system are required) 5.3 : Inverse functions-inverse function test, inverse function rule 5.6: Graphing in polar coordinates- Checking symmetry of graphs given in polar equation, drawings, tangents to graph in polar coordinates 8.3: Hyperbolic functions- hyperbolic sine, cosine, tan etc., derivatives, anti-differentiation formulas 8.4: Inverse hyperbolic functions- inverse hyperbolic functions (their derivatives and anti-derivatives) 10.3: Arc length and surface area- Length of curves, Area of surface of revolution about x and y axes 10.4: Parametric curves- parametric equations of lines and circles, tangents to parametric curves, length of a parametric curve, speed 10.5: Length and area in polar coordinates- arc length and area in polar coordinates , Area between two curves in polar coordinates 84

Module II

11.3: Improper integrals- integrals over unbounded intervals, comparison test, integrals of unbounded functions 11.4: Limit of sequences and Newton's method- $\varepsilon - N$ definition, limit of powers, comparison test, Newton's method 11.5: Numerical Integration- Riemann Sum, Trapezoidal Rule, Simpson's Rule 12.1: The sum of an infinite series- convergence of series, properties of limit of sequences (statements only), geometric series, algebraic rules for series, the i th term test 12.2: The comparison test and alternating series-

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comparison test, ratio comparison test, alternating series, alternating series test, absolute and conditional convergence 12.3: The integral and ratio test-integral test, p-series, ratio test, root test 12.4: Power series – ratio test for power series, root test, differentiation and integration of power series, algebraic operation on power series 12.5: Taylor's formula- Taylor and Maclaurian series, Taylor's formula with remainder in integral form, Taylor's formula with remainder in derivative form, convergence of Taylor series, Taylor series test, some important Taylor and Maclaurin series

Module III Text (3) 12 hrs.

7.6: Vector spaces – definition, examples , subspaces, basis, dimension, span 7.7: Gram-Schmidt Orthogonalization Process- orthonormal bases for $\mathbb{R}n$, construction of orthonormal basis of $\mathbb{R}\,n$ 8.2: Systems of Linear Algebraic Equations- General form, solving systems, augmented matrix, Elementary row operations, Elimination Methods: Gaussian elimination, Gauss–Jordan elimination, row echelon form, reduced row echelon form, inconsistent system , networks, homogeneous system, over and underdetermined system 8.3: Rank of a Matrix- definition, row space, rank by row reduction, rank and linear system, consistency of linear system 858.4: Determinants- definition, cofactor (quick introduction) 8.5: Properties of determinant- properties, evaluation of determinant by row reducing to triangular form

Module IV Text (3) 14 hrs.

8.6: Inverse of a Matrix – finding inverse, properties of inverse, adjoint method, row operations method, using inverse to solve a linear system 8.8: The eigenvalue problem- Definition, finding eigenvalues and eigenvectors, complex eigenvalues, eigenvalues and singular matrices, eigenvalues of inverse 8.9: Powers of Matrices- Cayley Hamilton theorem, finding the inverse 8.10: Orthogonal Matrices- symmetric matrices and eigenvalues, inner product, criterion for orthogonal matrix, construction of orthogonal matrix 8.12Diagonalization- diagonalizable matrix -sufficient conditions, orthogonal diagonalizability of symmetric matrix, Quadratic Forms 8.13: LU Factorization- definition, Finding an LU- factorization, Doolittle method, solving linear systems (by LU factorization), relationship to determinants

ELE2C02 - Electronic Circuits
Number of Contact Hours: 45 Hrs.

Course Objectives
1. To learn the basics of electronic components

2. To study circuit troubleshooting
3.To learn the circuit assembling
4.To learn the basics of testing and measuring instruments
Course Outcomes
CO1: Students able to understand the rectifiers, filters and voltage regulators circuits.
CO2: Ability to understand a SMPS circuits and different IC voltage regulators
CO3: Identify and understand how transistor working as an amplifier
CO4: Demonstrate familiarity with biasing methods
CO5: Enable students to understand different amplifiers and oscillators

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	0	2	2	2	1	0
CO2	1	2	0	2	2	2	1	1	0
CO3	2	0	2	2	2	1	2	2	1

CO4	**2**	**2**	**0**	**2**	**1**	**2**	**2**	**2**	**1**
CO5	**2**	**2**	**2**	**1**	**0**	**2**	**1**	**2**	**2**

COURSE DETAILS:

Module I
Rectifier circuits, half wave rectifier, full wave rectifier, bridge rectifier, Ripple factor, General filter consideration, different type of filters, comparison, voltage regulators – zener diode regulator, Three terminal regulators (78XX and 79XX) – Principle and working of switch mode power supply (SMPS).

Module II
Biasing of BJT- Q-point, stability factor and biasing circuits, BJT amplifiers, RC-coupled amplifiers, frequency response, voltage gain, current gain, input resistance and output resistance, comparison of BJT amplifiers concept of gain – applications.

Module III
Feedback amplifier, positive and negative feedback, Types of feedback, applications, power amplifier – class A, class B and class C amplifiers.

Module IV
Oscillators - sinusoidal oscillators, Barkhuizen criteria, RC-oscillators, LC oscillators, crystal oscillators, multivibrators, typical oscillators, applications, 555 timer – astable and monostable mode

**BCS2B03 - Programming Laboratory I: Lab Exam of 1st & 2nd Semester –
HTML and Programming in C**

Course Objectives
1.To make the students learn web designing

2.To make the students learn programming environments.
3.To practice procedural programming concepts
4.To make the students equipped to solve mathematical or scientific problems using C
Course Outcomes
CO1:Enable students to understand internet and develop web page creation using basic HTML Tags
CO2: Enable students to create web pages with different styles and formats.
CO3: Develop the students to create programs using basic C programming methods, Decision making statements, branching statements, looping statements and functions.
CO4: Develop the students to create programs using Array, structure , union, pointers and files.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3
CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	3	3	3	3

Part A: HTML lab work

List of Exercises:

1) Design a web page to display the information of Computer Science department of your college by using basic page tags. Display the information in the form of paragraphs/sentences. Also use effects to highlight the information like bold, italic or underline.

2) (a) Create a webpage with HTML describing your department. Use paragraph and list tags.

   (b) Apply various colors to suitably distinguish key words. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.

3) Use the above webpage to

> a) Create links on the words e.g. "Wi-Fi" and "LAN" to link them to Wikipedia pages.
>
> b) Insert an image and create a link such that clicking on image takes user to other page.
>
> c) Change the background color of the page. At the bottom create a link to take user to the top of the page.

4) Design a page to display the information in table format. Display the list of colleges offering B.Sc. Computer Science along with the details College Name, Address, Contact no. Address column will consist of sub columns as House Name, Post, City and pin code.

5) Create a webpage to create a photo Album. When the user clicks on the Image and Video Link it should open the corresponding album.

6) Design web pages which display the product images and its information with it. The products are computer, printers and laptop. The information displayed of product should be configuration/ technical details, price etc.

(Purpose: - Study image tag. Display image in tabular form along with the other text information.)

7) Design a page to display the B.Sc. Computer Science syllabus by using List tag.

(Purpose: - Introduce list tag to display data in ordered or unordered format as main, sub main, sub-sub main, etc. by using nos. or special types of bullets.)

8) Create HTML pages using Hyper Links

i. File Link

ii. Single Page Link

9) Create a hyperlink to show the information and syllabus of B.Sc. Computer Science. When click on the links each page should display the objective of respective course, Lesson plan, Course duration etc.

(Purpose: - Introduce anchor tag to create links between pages. One can able to transfer the control to next page, previous page or to a specific page like Home page.)

10) Design an HTML page describing your University infrastructure. Use tables to provide layout to your HTML pages.

11) Use <span> and <div> tags to provide a layout to the above HTML page instead of a table

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layout.

12) HTML pages with Tables

i. Use Tables to layout HTML pages

ii. Use <span> and <div> tags to provide a layout to the above page instead of table layout

iii. Use Frames to divide the page contents into different parts

iv. Embed Audio and Video into your HTML webpage

13) Design a page to display the information in table format. Display the list of colleges offering Computer Science along with the details College Name, Address, Contact no. Address column will consist of sub columns as Post Office, City, District and Pin code.

(Purpose: - Introduction of table tags along with the sub columns and other supportive tags like caption, cell spacing, cell padding etc.)

14) Create an HTML page to show the use of Navigation Frame

15) Create an HTML page to show the use of Floating Frame

16) Create an HTML page to show the use of Inline Frame

17) Design web pages to display the information about your college and UG Programmes offered in your college. Divide the page into three frames. The top frame should display the title of the college, left frame shout display the UG Programmes and the right frame display the details of selected programme like fees, syllabus etc.

(Purpose: - Study frame tag which allow to divide the screen into no of sections.)

18) Design web pages to accept the student information. Student should enter the details like first name, last name, middle name, city up to 25 characters, and address up to 50 characters. Show the combo box to select the qualification, option button for gender selection. Display the information accepted in a formatted form.

(Purpose: - Study form tag which allow to design the formatted screen to accept the information from the user.)

19) Design a website to show the use of the following input controls

i. Checkbox,

ii. Radio button,

20) Design a website to show the use of the following input controls

i. Select box,

ii. Hidden controls

21) Design CSS style sheet to define settings for heading, body, table and links.

(Purpose: - Study CSS style sheet facility. This allows setting the default settings for all the pages.)

22) Design a webpage to show the use of External Style Sheets

Part B: C Programming

Write programs to do the following:

1. Find the sum of digits and reverse of a number.
2. Find the distance between two points.
3. Find the factorial of a number.
4. Find the Nth Fibonacci number using recursion.
5. Print the reverse of a string using recursion.
6. Solve the problem of Towers of Hanoi using recursion.
7. Find Sin(x) and Cos(x) in the range 0o to 180o (interval 30o) using functions.
8. Create a pyramid using „*".
9. Display the multiplication tables up to the number N.
10. Find the number of words in a sentence.
11. Perform matrix addition, subtraction, multiplication, inverse, and transpose using pointers and functions.
12. Replace a part of the string with another string.
13. Find the power of a number using structure and union.
14. Find the average of prime numbers in a group of N numbers using function.
15. Find the sum of the series S = 1 + (½)2 + (1/3)3 + ... to 0.0001% accuracy.
16. Display the rightmost digit in a floating point number.
17. Create a pattern with the number N.

e.g. N = 39174 Pattern: 3 9 1 7 4

9 1 7 4

1 7 4

7 4

4

18. Display the short form of a string. E.g. Computer Science: CS
19. Currency conversion (any four currencies)
20. Find the currency denomination of a given amount.
21. Prepare sales bill using array of structures.
22. Addition and subtraction of complex numbers using structure.
23. Find the Armstrong numbers within a given range.
24. Check for palindrome string/number.
25. Check for leap year.
26. Find the number of special characters in a given string.
27. Store and read data from a text file.

28. Write odd and even numbers into separate files.
29. Swapping of two numbers using call-by-reference method.
30. Copy the contents of one file into another one using command line parameters.
31. Base conversion of numbers.
32. Calculate the percentage of marks obtained for N students appeared for examination in M subjects using array of structures.
33. Display a table of the values of function y = exp(-x) for x varying from 0.0 to N in steps of 0.1
34. Design a Scientific Calculator and include as many functions as possible.
35. Merge two numeric arrays in sorted order.
36. Fill upper triangle with 1, lower triangle with -1 and diagonal elements with 0.
37. Count the occurrence of different words in a sentence.
38. Convert an input amount into words.
39. Convert a time in 24-hour clock to a time in 12 hours.
40. Change the date/time format using structure.

NCSBC01-Bridge Course-Basics of C programming

Course Objectives
1. Impart the confidence and skills to successfully transition to new system
Course Outcomes
CO1: Define the basic concepts in C programming.
CO2: Develop academic skills and assist the students to learn C programming.

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

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CO ↓									
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

COURSE DETAILS:

Unit I

Structure of C: Header and body, Use of comments, Compilation of a program

Unit II

Data Concepts: Variables, Constants, data types like: int, float char, double and void. Declaring and initialize variables

Unit III

Types of operators: Arithmetic, Relational, Logical, Compound Assignment, Increment and

decrement, Conditional or ternary, Bitwise and Comma operators. statements and expressions.

Unit IV

Data Input and Output functions: printf() and scanf()

Unit V

Iterations: Control statements for decision making: branching: if statement, else… if statement, switch statement. Loop: while loop, do… while, for loop. jump statements: break, continue and goto.

AUD2E02 DISASTER MANAGEMENT

Course Objective

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The study aims at providing an understanding on disaster management and various types of disasters. It provides an awareness about disaster prevention and risk reduction and enables to impart knowledge on climate change adaptation and scenarios.

Course Outcomes:

- Understand the need and significance of studying disaster management
- Understand the different types of disasters and causes for disasters.
- Gain knowledge on the impacts Disasters on environment and society
- Study and assess vulnerability of a geographical area.
- Students will be equipped with various methods of risk reduction measures and risk mitigation.

Module 1:

Introduction – Hazard and Disaster. Concepts of Hazard, Vulnerability, Risks. Different Types

of Disaster: A) Natural Disaster: such as Flood, Cyclone, Earthquakes, Landslides etc B) Manmade Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc. Slow Disasters (famine, draught, epidemics) and Rapid Onset Disasters (Air Crash, tidal waves, Tsunami) Causes, effects and practical examples for all disasters. Water and Climate Disaster: flood, hail storms, cloudburst, cyclones, heat and snow avalanches, cold waves, droughts, sea erosion, thunder and lightning. Geological Disaster: landslides, earthquakes, Tsunami, mine fires, dam failures and general fires. Biological Disaster: epidemics, pest attacks, cattle epidemic and food poisoning. Nuclear and Industrial Disaster: chemical and industrial disasters, nuclear accidents. Accidental Disaster: urban and forest fires, oil spill, mine flooding incidents, collapse of huge building structures.

Module 2:

Natural disasters- Earthquakes, Tsunami, Floods, Drought, Landslides, Cyclones and Volcanic eruptions. Their case studies. Coastal disasters. Coastal regulation Zone. Risk and Vulnerability Analysis 1. Risk : Its concept and analysis 2. Risk Reduction 3. Vulnerability: Its concept and analysis 4. Strategic Development for Vulnerability Reduction Disaster Prevention and Mitigation. Refugee operations during disasters, Human Resettlement and Rehabilitation issues during and after disasters, Inter-sectoral coordination during disasters, Models in Disasters.

Module 3:

Disaster Preparedness and Response Concept and Nature Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster. Role of Information, Education, Communication, and Training, Disaster Management: Role of Government, International and NGO Bodies. Role of IT in Disaster Preparedness Role of Engineers on Disaster Management. Response Disaster Response: Introduction Disaster Response Plan Communication, Participation, and Activation of Emergency Preparedness Plan Search, Rescue, Evacuation and Logistic Management Role of Government, International and NGO Bodies Psychological Response and Management (Trauma, Stress, Rumor and Panic) Relief and Recovery Medical Health Response to Different Disasters.

Module 4:

Rehabilitation, Reconstruction and Recovery Reconstruction and Rehabilitation as a Means of Development. Damage Assessment Post Disaster effects and Remedial Measures. Creation of Long-term Job Opportunities and Livelihood Options, Disaster Resistant House Construction Sanitation and Hygiene Education and Awareness, Dealing with Victims' Psychology, Long term Counter Disaster Planning Role of Educational Institute.

Module 5:

The vulnerability atlas of India. Disaster Prevention and Mitigation. Agencies involved in Disaster Management. Warning and Prediction

Essential Reading:

1. Pandey, M., 2014. Disaster Management, Wiley India Pvt. Ltd., 240p.

2. Tushar Bhattacharya, Disaster Science and Management, McGraw Hill Education (India)

Pvt. Ltd

3. Jagbir Singh, Disaster, Management: Future Challenges and Opportunities, K W Publishers

Pvt. Ltd.

4. J.P. Singhal, Disaster Management, Laxmi Publications

5. C. K. Rajan, Navale Pandharinath, Earth and Atmospheric Disaster Management : Nature and Manmade, B S Publication

6. Shailesh Shukla, Shamna Hussain, Biodiversity, Environment and Disaster Management,

Subject Name: Basic Skills Enrichment Syllabus Code: BSE
Subject Code: SEP 01 Total: 15 Hours
Program Objective:
To make the students aware of themselves, their environment, about the challenges and to equip them with the basic communication and technical skills, along with practical training sessions.

Course Outcome:
To develop their self-management and communicational skills and also equip them with the basic technical skills.

Module 1: Effective Communication (LSRW) (5 Hrs)

Session 16: Listening skills: Listening to the words, sentences and passages. Sharing You Tube videos, homework related to the topics and its presentation in class.
Session 17: Speaking skills: vocabulary, speech, pronunciation of the words, sentences and passages. Assigning Situational conversation exercises.
Session 18: Reading skills: Comprehension passages, question and answers
Session 19-20: Writing skills: Grammar, basics, exercises, sentence formations

Module 2: MS office Suite (10 Hrs)

Session 21-23: Starting MS Word, working with symbols, working with tables, headers, footers and other controls, formatting
Session 24-26: MS Excel, MS PPT - Formatting a worksheet, formatting cells, Using formula & graphs
Session 27-28: Google docs, Google forms, Google spreadsheet, Google Meet
Session 29-30: Introduction to Photoshop/poster making and video editing

Onwards

SEMESTER III

A11 – Python Programming
No. of sessions: 64

Course Objectives
1. To learn basics of Python programming
2.To learn decision making, looping and functions in Python
3.Understand Object Oriented Programming using Python

Course Outcomes
CO1: Identify and recall Python programming basics and paradigm, demonstrating an understanding of fundamental concepts in Python programming.
CO2: Demonstrate an understanding of Python looping and control statements, interpreting how they function within the context of programming tasks.
CO3: Apply knowledge to develop the ability to create and use functions, global variables, recursion, and analytical skills. Demonstrate the practical application of Python programming in coursework and professional development.
CO4: Analyze and comprehend the use of Python string, list, tuple, dictionary, and manipulations on them showcasing the ability to break down and understand complex data structures in Python programming.
CO5: Equip students for developing mini projects using Python standards.

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

CO ↓								
CO1	3	0	1	3	3	2	3	3	2
CO2	3	0	0	3	3	3	3	3	2
CO3	3	0	1	3	3	3	3	3	2
CO4	3	0	1	3	3	3	3	3	2
CO5	3	0	3	3	3	3	3	3	2

COURSE DETAILS:

UNIT I
Introduction to python, features, IDLE, python interpreter, Writing and executing python scripts, comments, identifiers, keywords, variables, data type, operators, operator precedence and associativity, statements, expressions, user inputs, type function, eval function, print function.

UNIT II
Boolean expressions, Simple if statement, if-elif-else statement, compound boolean expressions, nesting, multi way decisions. Loops: The while statement, range functions, the for statement, nested loops, break and continue statements, infinite loops.

UNIT III
Functions, built-in functions, mathematical functions, date time functions, random numbers, writing user defined functions, composition of functions, parameter and arguments, default parameters, function calls, return statement, using global variables, recursion.

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UNIT IV

String and string operations, List- creating list, accessing, updating and deleting elements from a list, basic list operations. Tuple- creating and accessing tuples in python, basic tuple operations. Dictionary, built in methods to access, update and delete dictionary values. Set and basic operations on a set.

BCS3B04 – Data Structures Using C

Course Objectives
1. To introduce the concept of data structures
2. To make the students aware of various data structures
3. To equip the students implement fundamental data structures

Course Outcomes
CO1 - Develop ability to analyze algorithms and algorithm correctness and impart the basic concepts of data structures and algorithms
CO2 -Enable students to describe how arrays,, linked structures are represented in memory and used by algorithms aswell as describe common applications for arrays, linked structures
CO3 - Demonstrate stacks, queues are represented in memory and used by algorithms and describe common applications for stacks, queues
CO4 - Demonstrate different methods for traversing trees and how represented in memory
CO5-Enable students to Design and implement an appropriate hashing function
CO6 - Student will be able to summarize searching and sorting techniques

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
CO1	3	1	0	3	3	3	3	3	3
CO2	3	1	0	3	3	3	3	3	3
CO3	3	1	0	3	3	3	3	3	3
CO4	3	1	0	3	3	3	2	2	2
CO5	3	1	0	3	3	3	3	3	3
CO6	3	1	0	3	3	3	2	3	3

COURSE DETAILS:

UNIT I [9 T + 7L]
Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space trade off, Big-O notation. Strings: Introduction, strings, String operations, Pattern matching algorithms

UNIT II [10 T + 14 L]
Arrays: Introduction, Linear arrays, Representation of linear array in memory, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, sparse matrix. Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list,

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Header linked list, Circular linked list, Two-way linked list, Applications of linked lists, Algorithm of insertion/deletion in Singly Linked List (SLL).

UNIT III [10 T + 14 L]

Stack: primitive operation on stack, algorithms for push and pop. Representation of Stack as Linked List and array, Stacks applications: polish notation, recursion. Introduction to queues: Primitive Operations on the Queues, Circular queue, Priority queue, Representation of Queues as Linked List and array, Applications of queue: Algorithm on insertion and deletion in simple queue and circular queue.

UNIT IV [10 T + 14 L]

Trees - Basic Terminology, representation, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree: insertion, deletion and processing, Traversal of binary trees: In order, Pre-order & post-order, Algorithm of tree traversal with and without recursion, Binary Search Tree, Operation on Binary Search Tree, expression trees, implementation using pointers, applications.

UNIT V [10 T + 14 L]

Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, graph traversal- depth-first and breadth-first traversal of graphs, applications. Searching: sequential searching, binary searching, Hashing – linear hashing, hash functions, hash table searching; Sorting: Quick Sort, Exchange sort, Selection sort and Insertion sort.

A12-Sensors and Transducers   **No. of sessions: 64**

Course Objectives
1. To learn basics of transducers
2. To learn construction and working of transducers
3. To understand various types of transducers
Course Outcomes
CO1:Explain resistance, inductance and capacitance transducers.
CO2: Perceive the concepts of temperature and pressure transducers.
CO3: Perceive the concepts level transducers such as and flow transducers
CO4: Explain Electromagnetic transducers and radiation sensors.

CO5:Explain force and torque transducers and sound transducers

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	2	3	0	1	2	0	2	2
CO2	3	0	1	2	0	2	2	1	2
CO3	0	1	2	0	2	3	1	2	3
CO4	2	2	1	2	3	0	1	2	2
CO5	2	0	1	2	3	2	2	2	2

Unit I [16 T]

Transducers: Definition, Principle of sensing & transduction, Classification, Characteristics of transducers. Basic requirement of transducers. Resistance Transducer: Basic principle – Potentiometer –Loading effects, Resistance strain gauge– Types. Inductance Transducer: - Basic principle – Linear variable differential transformer – RVDT- types. Capacitance Transducer: Basic principle- transducers using change in area of plates – distance between plates- variation of dielectric constants –Types

Unit II [16 T]

Thermal sensors: Resistance change type: RTD - materials, construction, types, working principle, Thermistor - materials, construction, types, working principle, Thermo emf sensors: Thermocouple – Principle and types, Radiation sensors: Principle and types. Pressure Transducers: basic principle- different types of manometers-u tube manometer-well type manometers.

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Unit III [16 T]

Level transducer-continuous level measurement-discrete level measurement-mass – capacitive level gauges Flow Transducers: Bernoulli's principle and continuity, Orifice plate, nozzle plate, venture tube, Rotameter, anemometers, electromagnetic flow meter, impeller meter and turbid flow meter

Unit IV [16 T]

Hall effect transducers, Digital transducers, Piezo-electric sensors, eddy current transducers, tacho generators and stroboscope, Magnetostrictive transducers Radiation sensors: LDR, Photovoltaic cells, photodiodes, photo emissive cell types Force and Torque Transducers: Proving ring, hydraulic and pneumatic load cell, dynamometer and gyroscopes. Sound Transducers: Sound level meter, Microphone.

MTS3 C03: MATHEMATICS-111
No. of sessions: 64

Course Objectives
1. To learn vector valued functions
2. To learn more about Complex numbers and related theorems
Course Outcomes
CO1: Explain Vector valued functions
CO2: Understand more about partial differentiation and its applications
CO3: Learn more about double integral and triple integral
CO4: Understand more about the theorems related with the complex numbers and identify complex numbers
CO5: Understand more about the theorems related with the complex numbers.

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
CO1	2	1	1	1	1	1	0	1	0
CO2	3	1	1	1	1	0	1	1	1
CO3	3	1	1	1	1	1	1	0	0
CO4	2	1	1	1	1	0	0	1	1
CO5	2	1	1	1	1	1	1	0	0

COURSE DETAILS:

Module I - 21 hrs.
Vector Functions – Vector-Valued Functions, Limits, Continuity, and Derivatives, Geometric Interpretation of $r\,'(t)$, Higher-Order Derivatives, Integrals of Vector Functions, Length of a Space Curve, Arc Length as a Parameter 9.2: Motion on a Curve-Velocity and Acceleration, Centripetal Acceleration, Curvilinear Motion in the Plane 9.3: Curvature and components of Acceleration- definition, Curvature of a Circle, Tangential and Normal Components of Acceleration, The Binormal, Radius of Curvature 9.4: Partial Derivatives-Functions of Two Variables, Level Curves, Level Surfaces, Higher-Order and Mixed Derivatives, Functions of Three or More Variables, Chain Rule, Generalizations 9.5: Directional Derivative-The Gradient of a Function, A Generalization of Partial Differentiation, Method for Computing the Directional Derivative, Functions of Three Variables, Maximum Value of the Directional Derivative, Gradient Points in Direction of Most Rapid Increase off 9.6: Tangent planes and Normal Lines-Geometric Interpretation of the Gradient, Tangent Plane, Surfaces Given by $z = f(x, y)$, Normal Line

Module II 24 hrs

9.7: Curl and Divergence-Vector Fields, definition of curl and divergence, Physical Interpretations 9.8: Line Integrals-definition of smooth. Closed and simple closed curves, Line Integrals in the Plane, Method of Evaluation-curve as explicit function and curve given parametrically, Line Integrals in Space, Method of Evaluation, Work, Circulation 9.9: Independence of Path- Conservative Vector Fields, Path Independence, A Fundamental Theorem, definition of connected, simply connected and multiconnected 87regions, Integrals Around Closed Paths, Test for a Conservative Field, Conservative Vector Fields in 3-Space, Conservation of Energy 9.10: Double Integral- Integrability, Area, Volume, Properties, Regions of Type I and II, Iterated Integrals, Evaluation of Double Integrals (Fubini theorem), Reversing the Order of Integration, Laminas with Variable Density—Center of Mass, Moments of Inertia, Radius of Gyration 9.11: Double Integrals in Polar Coordinates- Polar Rectangles, Change of Variables: Rectangular to Polar Coordinates, 9.12: Green's Theorem- Line Integrals Along Simple Closed Curves, Green's theorem in plane, Region with Holes, 9.13: Surface Integral- Surface Area, Differential of Surface Area, Surface Integral, Method of Evaluation, Projection of S into Other Planes, Mass of a Surface, Orientable Surfaces, Integrals of Vector Fields-Flux, 9.14: Stokes's Theorem- Vector Form of Green's Theorem, Green's Theorem in 3- Space-Stoke's Theorem, Physical Interpretation of Curl

Module III - 21 hrs.

9.15:Triple Integral- definition, Evaluation by Iterated Integrals, Applications, Cylindrical Coordinates, Conversion of Cylindrical Coordinates to Rectangular Coordinates, Conversion of Rectangular Coordinates to Cylindrical Coordinates, Triple Integrals in Cylindrical Coordinates, Spherical Coordinates, Conversion of Spherical Coordinates to Rectangular and Cylindrical Coordinates, Conversion of Rectangular Coordinates to Spherical Coordinates, Triple Integrals in Spherical Coordinates 9.16: Divergence Theorem- Another Vector Form of Green's Theorem , divergence or Gauss' theorem, (proof omitted), Physical Interpretation of Divergence 9.17: Change of Variable in Multiple Integral- Double Integrals, Triple Integrals 17.1: Complex Numbers- definition, arithmetic operations, conjugate, Geometric Interpretation 17.2: Powers and roots-Polar Form, Multiplication and Division, Integer Powers of z , DeMoivre's Formula, Roots 8817.3: Sets in the Complex Plane- neighbourhood, open sets, domain, region etc. 17.4: Functions of a Complex Variable- complex functions, Complex Functions as Flows, Limits and Continuity, Derivative, Analytic Functions - entire functions 17.5: Cauchy Riemann Equation- A Necessary Condition for Analyticity, Criteria for analyticity, Harmonic Functions, Harmonic Conjugate Functions, 17.6:Exponential and Logarithmic function- (Complex)Exponential Function, Properties, Periodicity, ('Circuits' omitted), Complex Logarithm-principal value, properties, Analyticity 17.7: Trigonometric and Hyperbolic functions- Trigonometric Functions, Hyperbolic Functions, Properties -Analyticity, periodicity, zeros etc.

Module IV

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18.1: Contour integral- definition, Method of Evaluation, Properties, MLinequality. Circulation and Net 18.2: Cauchy-Goursat Theorem- Simply and Multiply Connected Domains, Cauchy's Theorem, Cauchy–Goursat theorem, Cauchy–Goursat Theorem for Multiply Connected Domains, 18.3: Independence of Path-Analyticity and path independence, fundamental theorem for contour integral, Existence of Antiderivative 18.4: Cauchy's Integral Formula- First Formula, Second Formula-C.I.F. for derivatives. Liouville's Theorem, Fundamental Theorem of Algebra

ELE3C03 - Digital Electronics
Number of Contact Hours: 45 Hrs.

Course Objectives
1. To equip the students with detailed knowledge in digital electronics
2. Many of the ideas are important to learn about microprocessors.
3.To learn different number systems, logic gates, comparators, flip flops etc
Course Outcomes
CO1: Explain and apply the basic concepts of number systems and the use of Binary, Decimal and Hexadecimal number systems, and demonstrate competence in the conversion of numbers from one representation to another.
CO2: Demonstrate familiarity with Boolean Operations, the Laws of Boolean Algebra, DeMorgan Theorems and the application of Boolean Algebra and Karnaugh Maps to simplify logic circuits.
CO3: To understand combinational logic circuits and implementing logic function
CO4: Enable to understand sequential logic design

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CO5: Student will be able to understand different types of memories used in digital and microprocessor system

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	0	2	2	2	1	2	2	2
CO2	1	2	2	0	1	2	0	2	2
CO3	2	0	1	2	0	2	2	2	2
CO4	1	2	0	2	2	1	2	2	0
CO5	2	2	2	2	2	1	0	2	2

COURSE DETAILS:

Module I

Number System and Codes: Decimal, Binary, Hexadecimal, Octal, BCD, conversion of one code to another, Complements (one's and two's), Signed and Unsigned numbers, Addition and Subtraction, Multiplication.

Logic Gates and Boolean Algebra: Truth Tables, OR, AND, NOT, XOR, XNOR, Universal (NOR and NAND) Gates, Boolean Theorems, DeMorgan's Theorems, Principle of duality.

Module II
Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Karnaugh map minimization. Multiplexers and Demultiplexers, Implementing logic functions with multiplexer, Adder (half and full) and subtractor, Encoder and Decoder.

Module III
Sequential logic design: Latch, Flip flop (FF), S-R FF, J-K FF, T and D type FFs, Clocked FFs, Registers, Counters (synchronous and asynchronous, ring, modulo-N), Shift registers – Serial and parallel

Module IV
Memories: General Memory Operation, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAPROM

NCSACT06-Mini Project-Python

Description: It provides a fundamental understanding of the Python programming language and enables one to have the skills and understanding of Python to confidently apply for Python programming jobs. It also acquires the prerequisite Python skills to move into specific branches - Machine Learning, Data Science, etc.

Course Objectives
1. To understand the real time software development environment. The student can gain a thorough knowledge in developing a application using python
Course Outcomes
CO1: To acquire programming skills in core Python and Object Oriented Skills in Python
CO2: To develop the skill of designing Graphical user Interfaces in Python

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

NCAWWS02-Walk with the Scholar-Research Writing

Course Objectives
1. To help the students to identify a better career option.
Course Outcomes
CO1: To develop certain generic skills, non-technical competencies, attitudes and behaviours
CO2: To provide necessary orientation, guidance ,motivation and support to enrich and nourish their talents.

COURSE DETAILS:

Overview of Research, Overview of Literature Survey: Literature Survey using Web of Science,

Literature Survey using Scopus, Data Analysis, how to make technical presentation – Technical Writing, Intellectual property, Research in Computer Science & Engineering.

AUD3E03- HUMAN RIGHTS

Course Objective

In-depth insight into the constitutional, statutory and institutional aspects of human rights and special legislations dealing with protection of vulnerable and marginalized groups.

Course outcomes

1. Understand the importance and different approaches to Human rights

2. Understand the different mechanisms of United Nations to ensure and protect the Human

Rights

3. Understand the different Constitutional provisions and legislations to protect Human Rights

in India

4. Analyse the functions of NHRC, Judiciary and PIL for protecting Human Rights in India

5. Examine the challenges to Human Rights of different vulnerable sections

MODULE –I

HUMAN RIGHTS; Meaning, Evolution and Importance Approaches; Western, Marxian, Feminist and Third World

MODULE – II

U N O AND HUMAN RIGHTS (a)Universal Declaration of Human Rights (b)International Covenants on Civil and Political Rights(ICCPR), International Covenant on Social Economic and Cultural Rights(ICSECR) (c) The Office of the United Nations High Commissioners for Human Rights(UNHCHR)

MODULE- III

HUMAN RIGHTS IN INDIA (a)Constitutional Provisions- Fundamental Rights, Directive Principles of State Policy

(b)Some important Legislations 1) Protection of Civil Rights Act-1955 2) Prevention of Atrocities (SC and ST) Act 1989

3) Sexual Harassment of Women at workplace (Prevention, Prohibition and Redressal) Act, 2013 4) The Rights of Persons with Disabilities Act-2016 5) Right to information Act 2005 (c) Agencies Protecting Human Rights ; Judiciary, Public Interest Litigation, National Human Rights Commission and Media

MODULE- IV

CHALLENGES TO HUMAN RIGHTS

Human Rights Violations against Women, Children, Other marginalized sections like Minorities, Dalits, Adivasis and Women, Refugees

BOOKS AND REFERENCES

1 Andrew Clapham, Human Rights: A Very Short Introduction, Oxford University Press, New York, 2007

2 Darren J O Byrne,(ed), Human Rights: An Introduction, Pearson, New Delhi,2004

3 Chiranjeevi Nirmal, Human Rights in India, Oxford University Press, New Delhi,1997.

4 Pavithran K S,(ed), Human Rights in India: Discourse and Contentions, Gyan books, NewDelhi,2018

5 Ujwal Kumar Singh, (ed), Human Rights and peace: Ideas, Laws, Institutions and Movements, Sage, New Delhi,2009

6 Upendra Bax,: The RIGHT to be Human Lasncer International New Delhi, 1987.

7 Johari J.C Human Rights and New World Order Anmol Publications, New Delhi, 0998

Subject Name: Intermediate Skills Enrichment Syllabus Code: ISE

Subject Code: SEP 02 Total: 15 Hours

Program Objective   To make the students aware of their career choices and competencies required to be successful in their domain and equip them with the required skills

MODULE 1: Session 1- 3 (Quantitative Aptitude) 3 hrs.

➢ Divisibility, LCM, HCF

➢ Numbers, Decimals, Fractions

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➢ Powers, Algebra, Percentages

MODULE 2: Session 4-5 (Quantitative Aptitude) 2 hrs.

➢ Profit, Loss

➢ Simple interest, Compound interest

MODULE 3: Session 6-8 (Quantitative Aptitude) 3 hrs.

➢ Speed, Distance, Time

➢ Work & wages

➢ Ratio, proportion and partnerships

MODULE 4: Session 9-11(Quantitative Aptitude) 3 hrs.

➢ Searing arrangements, Calendar dates

➢ Probability

➢ Permutations and combinations

MODULE 5: Session 12-14 (Quantitative Aptitude) 3 hrs.

➢ Train, Boat, Streams- Upstream/Downstream

➢ Cisterns and pipes

➢ Mensuration

Assessment Test -1 Hour at the end of semester

Course Outcome:

To equip the students with the skills required to excel in their respective domains

Semester 4

1. A13 – Data Communication and Optical Fibers
   No. of sessions: 64

Course Objectives
1. To learn basics of data communication, Networking architectures and applications.
2. Expose the students to the basic of signal propagation through optical fibers, fiber impairments, components and devices and system design
Course Outcomes
CO1:Identify and understand processes to communicate with each other across a computer network.
CO2:Able to understand the concept of network topology
CO3: Understand the concept of multiplexing, GSM and its applications.
CO4: Analyze the services, roles and features of the data link control of data networks
CO5: Identify and understand the fundamental knowledge about optical fiber communication systems.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	3	3	3	3	3	3
CO2	3	2	2	3	3	3	3	3	3
CO3	3	2	2	3	2	2	3	3	3
CO4	3	2	2	3	2	3	3	3	3
CO5	3	2	2	3	3	3	3	3	3

COURSE DETAILS:

Unit I

Introduction- Components, Networks, Protocols and standards, Basic Concepts: Line Configuration, Topology Transmission mode, analog and digital signals, Encoding and modulating analog- to-digital conversion, digital to analog conversion, digital data transmission, DTE-DCE interface, modems, cable modems. Transmission media: guided media, unguided media, and transmission impairment.

Unit II

Multiplexing: Many to one/ one to many, frequency division multiplexing, wave division multiplexing, TDM, multiplexing applications: the telephone system, Cellular System, Mobile Communication-GSM, Mobile Services, GSM system Architecture, Radio Interface in GSM

Unit III

Data link Control: Line Discipline, flow control, error control, Data link Protocols: Asynchronous Protocols, synchronous protocols, character oriented protocols, bit – oriented protocols, link access procedures. Local Area Networks: Ethernet, token bus, token ring, FDDI, Comparison, Switching Circuit switching, packet switching, message switching, integrated services digital networks (ISDN): services, history, subscriber access to ISDN.

Unit IV

Overview of Optical Fiber Communication - Introduction, historical development, general system, advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, fiber materials, Optical Sources and Detectors- Introduction, LED"s, LASER diodes, Photo detectors. Ray theory, cylindrical fiber, single mode fiber, cutoff wavelength, mode field diameter.

BCS4B05 – Database Management System and RDBMS

No. of sessions: 112

Course Objectives
1. To learn the basic principles of database and database design
2. To learn the basics of RDBMS
3. To learn the concepts of database manipulation SQL
4. To study PL/SQL language
Course Outcomes
CO1: To learn the basic concepts of databases and data models and explains the features of database management systems, architecture of database systems, and the role of database users.
CO2: Develops an Entity-Relationship model based on user requirements and Convert an Entity-Relationship diagram to Relational Schema.
CO3: Learn Functional Dependency and Functional Decomposition and Applies various Normalization techniques for database design improvement.
CO4: Use the basics of SQL and construct queries using SQL in database creation and interaction.
CO5: To understand the principle of transaction management design and Design a commercial relational database system (Postgres) by writing SQL using the system.

CO-PO/PSO Mapping

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PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
CO1	3	2	0	3	3	3	3	3	2
CO2	3	2	0	3	3	2	3	3	3
CO3	3	1	0	3	3	3	3	3	3
CO4	3	1	0	3	3	3	3	3	3
CO5	3	1	0	3	3	3	3	3	3

COURSE DETAILS:

Unit I [8 T+ 2L]

Database System concepts and applications Introduction to databases, File Systems vs. DBMS, Advantages and Disadvantages of using DBMS Approach, Database administrators and user, Data Models, Schemas, and Instances, Types of Data Models, Three Schema Architecture and Data Independence, Database Languages and Interfaces.

Unit II [10 T+ 6L]

Entity-Relationship Model - Conceptual Data Models for Database Design Entity Relationship Models, Concept of Entity, Entity Sets, Relationship Sets, Attributes, Domains, Constraints, Keys, Strong and Weak Entities, Concepts of EER. Relational Data Model Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus, Relational Database Design using ER to Relational Mapping.

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Unit III [10 T+12L]

Relational Database Design - Relational database design Anomalies in a Database, Normalization Theory, Functional Dependencies, First, Second and Third Normal Forms, Relations with more than one Candidate Key, Good and Bad Decompositions, Boyce Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit IV [10 T +20L]

SQL Concepts: Basics of SQL, DDL, DML, DCL, Tables – Create, Modify and Delete table structures, Rename and Drop tables, defining constraints – Primary key, foreign key, unique, not null, check, IN operator Select Command, Logical Operators, Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All. View - Creation, Renaming the column of a view, destroys view.

Unit V [10 T+24L]

Transaction Management and Concurrency Control - Transaction Properties (ACID), states, Commit, Rollback; Concurrency Control Lost update problems, Locks, two phase locking. Programming with SQL: Data types: Base and Composite, Attributes. Variables – Constants - Using set and select commands, Control Structures: IF, IF THEN ELSE, IF THEN ELSEIF, CASE. Loops: LOOP, EXIT, CONTINUE, WHILE, FOR, and FOREACH - Looping Through Arrays - Looping Through Query Results. Security: Locks: Table-level Lock, Row-level Lock, Deadlock, Advisory Lock. Cursors: Boud and Unbound Cursors, Declaration, Opening, working with cursors: FETCH, MOVE, UPDATE/DELETE, CLOSE, Looping through a Cursor. Concept of Stored Procedures – Advantages and Disadvantages – Creation – Parameters Setting for Function-Alter – Drop – Grant and Revoke - Passing and Returning data to/from Stored Procedures - Using stored procedures within queries – Triggers: Creation, Modification, Deletion, Error Handling: Control Structures, Cursors, Functions, Triggers.

A14 Microprocessors-Architecture and Programming

Number of Contact Hours: 64 Hrs.

Course Objectives
1. To understand internals of Microprocessor
2. To learn architecture of 8085 Microprocessor
3.To learn instruction set of 8085 Microprocessor

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Course Outcomes
CO1: Enable students to understand internals of Microprocessor
CO2: Enable students to understand architecture of 8085 Microprocessor
CO3: Enable students to understand instruction set of 8085 Microprocessor
CO4:Enable students to program a Microprocessor
CO5: Enable students to understand basics of 8086 microprocessor

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	3	3	3	3	3	3
CO2	3	3	1	3	3	3	3	3	3
CO3	3	3	0	3	3	3	3	3	3
CO4	3	3	0	3	3	3	3	3	3

CO5	3	3	0	3	3	3	3	3	3

COURSE DETAILS:

Module I

General architecture of computer, Introduction to Microprocessor, Memory classification, Introduction to 8085, Microprocessor bus organizations, data bus, address bus, control bus. Memory addressing, memory mapping. 8085 architectures in detail. General purpose registers and special purpose registers, flag register - 8085 pins and signals.

Module II

Assembly language programming basics. Opcode, Mnemonics etc. 8085 instruction set, Data transfer, Arithmetic and Logic, Shifting and rotating, Branching/Jump, Program control. Addressing modes. Memory read and write cycle. Timing diagram. Instruction cycle, machine cycle and T-states. Types of I/O addressing. Simple programs.

Module III

Types of programming techniques looping, indexing (pointers), delay generation. Stack in 8085, call and return Instructions. Data transfer between stack and microprocessor. Subroutine and delay programs. Interrupts in 8085. Interrupt driven programs. Interfacing - Programmable peripheral devices - 8255A, 8254, 8237.

Module IV

Introduction to 8086/88 microprocessors – overview, 8086 internal architectures. The execution unit, BIU, Registers, Flags, Segmentation, physical address calculation, addressing modes.

MTS4 C04: MATHEMATICS-IV
No. of sessions: 64
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Course Objectives
1. To learn matrices and its applications
2. To learn more about convergence and divergence of sequences & series
Course Outcomes
CO1: To Explain the concept of differential equation
CO2: Able to find solutions of higher order linear differential equations
CO3: To understand Laplace transforms and orthogonal functions
CO4: To solve the ordinary differential equations using Laplace transforms
CO5: To Explain application of Fourier series

CO-PO/PSO Mapping

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	1	1	2	0	1	0
CO2	3	1	1	1	1	0	1	0	1
CO3	3	1	1	1	1	1	0	1	0
CO4	2	1	1	0	1	0	1	0	1

CO5	2	1	0	1	1	1	0	1	0

COURSE DETAILS:

Module I - 21 hrs.

Ordinary Differential Equations
1.1: Definitions and Terminology- definition, Classification by Type, Classification by Order, Classification by Linearity, Solution, Interval of Definition, Solution Curve, Explicit and Implicit Solutions, Families of Solutions, Singular Solution, Systems of Differential Equations 1.2: Initial Value Problems-First- and Second-Order IVPs, Existence of solution 1.3: Differential Equations as Mathematical Models- some specific differential equation models in biology, physics and chemistry. 2.1: Solution Curves without Solution- Direction Fields Autonomous First Order DEs' omitted] 2.2: Separable Equations- definition. Method of solution, losing a solution, An Integral-Defined Function 2.3: Linear Equations-definition, standard form, homogeneous and non-homogeneous DE, variation of parameter technique, Method of Solution, General Solution, Singular Points, Piecewise-Linear Differential Equation, Error Function 2.4: Exact Equations- Differential of a Function of Two Variables, Criteria for an exact differential, Method of Solution, Integrating Factors, 2.5: Solutions by Substitution-Homogeneous Equations, Bernoulli's Equation, Reduction to Separation of Variables 2.6: A Numerical Method- Using the Tangent Line, Euler's Method [upto and including Example 2; rest omitted]

Module II - 22 hrs.

Higher Order Differential Equations
3.1: Theory of Linear Equations- Initial-Value and Boundary-Value Problems [Existence and Uniqueness (of solutions), Boundary-Value Problem] Homogeneous Equations [Differential Operators, Superposition Principle, Linear Dependence and Linear Independence, Wronskian] Nonhomogeneous Equations [Complementary Function, Another Superposition Principle] 3.2: Reduction of Order- a general method to find a second solution of linear second order equation by reducing to linear first order equation 3.3: Homogeneous Linear Equations with Constant Coefficients- Auxiliary Equation, Distinct Real Roots , Repeated Real Roots , Conjugate Complex Roots, Higher-Order Equations , Rational Roots ['Use of computer' part omitted] 3.4: Undetermined Coefficients- Method of Undetermined Coefficients for finding

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out particular solution 3.5: Variation of parameter- General solution using Variation of parameter technique 3.6: Cauchy-Euler Equations- Method of solution, Distinct Real Roots, Repeated Real Roots, Conjugate Complex Roots 3.9: Linear Models & Boundary Value Problems- Deflection of a Beam, Eigenvalues and Eigenfunctions [upto and including Example 3: the rest is omitted]

Module III 19 hrs.

Laplace Transforms

4.1: Definition of Laplace Transform- definition, examples, linearity, Transforms of some basic functions, Sufficient Conditions for Existence of transform, 4.2: Inverse Transform and Transforms of Derivative- Inverse Transforms:- A few important inverse transforms, Linearity, Partial Fractions, Transforms of Derivatives, Solving Linear ODEs 914.3: Translation Theorems- Translation on the s-axis, first translation theorem, its inverse form, Translation on the t-axis, Unit step function, second translation theorem. Its Inverse form, Alternative Form of second translation theorem. Beams 4.4: Additional Operational Properties- Derivatives of Transforms, Transforms of Integrals-convolution, convolution theorem (without proof) and its inverse form, Volterra Integral Equation, Series Circuits ['Post Script— Green's Function Redux' omitted], Transform of a Periodic Function 4.5: The Dirac delta Function- Unit Impulse, The Dirac Delta Function and its transform,

Module IV 18 hrs.

12.1: Orthogonal Functions- Inner Product, Orthogonal Functions, Orthonormal Sets, Vector Analogy, Orthogonal Series Expansion, Complete Sets, 12.2: Fourier Series-Trigonometric Series, Fourier Series, Convergence of a Fourier Series, Periodic Extension, Sequence of Partial Sums, 12.3: Fourier Cosine and Sine Series- Even and Odd Functions., Properties, Cosine and Sine Series, Gibbs Phenomenon, Half-Range Expansions, Periodic Driving Force, 13.1: Separable Partial Differential Equations- Linear Partial Differential Equation, Solution of a PDE, Separation of Variables (Method), Superposition Principle, Classification of Equations (- hyperbolic, parabolic, elliptic) 13.2: Classical PDE's and BVP's- Heat Equation, Wave Equation, Laplace's Equation, Initial Conditions, Boundary Conditions, Boundary-Value Problems ('Variations' omitted) 13.3: Heat Equation- Solution of the BVP (method of Separation of Variables

ELE4C04 - Communication Electronics
Number of Contact Hours: 45 Hrs.

Course Objectives
1. To equip the students with basic knowledge in Communication systems
2. To learn the basics of modulation basics of AM, FM, and PCM
3.TTo learn the Digital modulation techniques
Course Outcomes
CO1: Enable students to understand basics knowledge about communication system
CO2: Ability to understand electromagnetic spectrum
CO3: Students able to compare the AM, FM and PM
CO4: Identify and understand the basics of PAM and PCM
CO5: Enable students to understand basics of Digital Modulation Techniques

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	2	3	2	1	2	1	2
CO2	0	0	0	1	1	0	0	2	1
CO3	1	1	1	1	0	1	1	1	0

CO4	2	0	2	2	1	0	1	0	1
CO5	2	1	0	1	0	0	0	1	0

COURSE DETAILS:

Module I
Electronic communication: Block diagram of an electronic communication system, electromagnetic spectrum-band designations and applications, need for modulation, Amplitude Modulation: Amplitude Modulation, modulation index and frequency spectrum. Generation of AM, Amplitude Demodulation (diode detector).

Module II
Angle modulation: Frequency and Phase modulation, modulation index and frequency spectrum, equivalence between FM and PM, Generation and demodulation of FM – Types –De-emphasis and Pre-empasis , FM detector (PLL). Comparison between AM, FM and PM.

Module III
Pulse Analog Modulation: Channel capacity, Sampling theorem, PAM, PDM, PPM, Multiplexing, TDM and FDM. Pulse Code Modulation: Need for digital transmission, Quantizing, Quantization Noise, Compounding, Coding, Decoding, and Regeneration.

Module IV
Digital Carrier Modulation Techniques: Block diagram of digital transmission and reception, Information capacity, Bit Rate and Baud Rate. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK).

BCS4B06- Programming Laboratory II: Lab Exam of 3rd and 4th Semester - Data Structures and RDBMS

Course Number: 22
Number of Credits: 4
Course Evaluation: Internal – 20 Marks + External – 80 Marks
Objective
• To make the students equipped to solve mathematical or scientific problems using C
• To learn how to implement various data structures.
• To provide opportunity to students to use data structures to solve real life problems.

BCS4B06- Programming Laboratory II: Lab Exam of 3rd and 4th Semester - Data Structures and RDBMS

Course Number: 22
Number of Credits: 4
Course Evaluation: Internal – 20 Marks + External – 80 Marks

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	2	0	3	3	2	1	1
CO2	3	2	3	0	3	3	3	3	3
CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	2	3	3	3
CO5	3	2	3	0	3	3	3	3	3

Objective

• To make the students equipped to solve mathematical or scientific problems using C

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• To learn how to implement various data structures.

• To provide opportunity to students to use data structures to solve real life problems.

Part A: Data structure – Lab Questions

1. Sort a given list of strings
2. Reverse a string using pointers.
3. Implement Pattern matching algorithm.
4. Search an element in the 2-dimensional array
5. Append 2 arrays
6. Merge two sorted array into one sorted array.
7. Search an element in the array using iterative binary search.
8. Search an element in the array using recursive binary search.
9. Implement sparse matrix
10. Implement polynomial using arrays
11. Implement singly linked list of integers.
12. Delete a given element from a singly linked list
13. Sort a singly linked list.
14. Delete an element from a singly linked list
15. Implement a doubly linked list of integers
16. Implement a circular linked list.
17. Implement polynomial using linked list
18. Addition of 2 polynomials
19. Implement Stack using array
20. Implement Stack using linked list
21. Infix expression into its postfix expression
22. Implement Queue using array
23. Implement Queue using linked list
24. Implement a binary search tree of characters.
25. Traverse a binary search tree non recursively in preorder
26. Traverse a binary search tree non recursively in inorder
27. Traverse a binary search tree non recursively in postorder
28. Traverse a binary search tree recursively in preorder
29. Traverse a binary search tree recursively inorder
30. Traverse a binary search tree recursively postorder.
31. Delete an element from a binary search tree.

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32. Search an element in a binary search tree
33. Implement linear sort
34. Implement bubble sort
35. Implement exchange sort
36. Implement selection sort.
37. Implement insertion sort.
38. Implement quick sort.
39. Implement merge sort.
40. Implement heap sort

NCSBC01-Bridge Course-Introduction to Object Oriented Programming

Course Objectives
1. To provide students the confidence and skills to successfully transition to new system
Course Outcomes
CO1: To define the basic concepts in object oriented programming.
CO2:.To develop academic skills and assist the students in object oriented programming.

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

CO ↓									
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

Unit I

Introduction to Object Oriented Programming: Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming.

Unit II

Basic principles of Object Orientation-class, object, abstraction, encapsulation, inheritance, polymorphism, modularity, and message passing.

Unit III

Features of object orientation - attributes, state, identity, operation, behaviour. Access specifiers-private, public, protected

Unit IV

Classes and Objects: Introduction, class fundamentals, defining a class, creating objects, accessing

class members.

Unit V

Inheritance and polymorphism - Introduction - Defining derived classes - Types of inheritances, compile time and Runtime polymorphism (concepts only)

NCSACT06- Industrial Interaction-Industry Ethics & Practices

Description: The main purpose is to give students an insight into the regular, internal workings of a company. It gives good understanding of the industry and helps in building up useful case studies for improving the quality of future teaching. It provides an ability to identify research programmes of industrial importance.

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Course Objectives
To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
Course Outcomes
CO1: To learn as to how theatrical concepts are put into action, thereby aiding their practical learning.
CO2:.To enhance interpersonal skills and communication techniques and to become more aware of industry practices and regulations

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	3	3

NCSACT07-Mini Project-Computer Graphics

Description: The main aim is to illustrate the concepts and usage of pre-built functions in OpenGL. Creating Figures and the surrounding environment using inbuilt functions provided by the glut library.

Course Objectives
1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics.

2.Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
Course Outcomes
CO1: To acquire programming skills in developing graphics based applications
CO2: To develop the skill of animation

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

AUD4E06-Gender Studies

Course Objectives

• To provide the relevance and significance of the ideas of gender equality and gender

justice in our society

• To develop an understanding about the basic concepts of gender studies

• To provide a historical background of women's movements and its relevance

• To understand the major debates around gendered ways of violence and to introduce

gender perspectives on popular culture

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Course - Outcomes

1. It helps the student to acquire knowledge about the importance of gender equality and women's rights

2. It helps the student to develop gender sensitivity through an analysis of contemporary social issues at the global, national and local levels

3. It helps the student to familiarize with analyzing the popular culture and media with a gender perspective

4. It equips the student to acquire knowledge about the various organs, conventions, constitutional provisions and redressal systems to combat gender discrimination

Module I

Introducing the concepts of sex and gender, gender division of labour, patriarchy, sexualities and sexual orientations, gender stereotypes, masculinities, intersectionalities of race, class, caste and gender in family and society

Suggested Readings

1. 50 Key concepts in Gender Studies, Jane Pilcher and Imelda Whelehan, Sage Publications, 2005

2. Understanding Gender: Kamala Bhasin, Women Unlimited, New Delhi, 2003.

3. What is Patriarchy? Kamala Bhasin, Women Unlimited, New Delhi, 2003.

4. Exploring Masculinity, Kamala Bhasin, Women Unlimited, New Delhi, 2003.

Module II

Women's Experiences in family & work, community, public sphere kinship structures, various forms of violence against women – female foeticide, infanticide, dowry, domestic violence, sexual assaults, rape, sexual harassment at workplace, honour killings – Government mechanisms to combat Violence against women in India

Suggested Readings

1. An overview of the status of women in India: Neera Desai and Maithreyi Krishnaraj,

P 296-319, Class, Caste, Gender- Readings in Indian Government and Politics-5, Ed.

Manoranjan Mohanty, Sage Publications, New Delhi, 2004

2. 'Towards Equality', Report of the Committee on the Status of Women in India, 1975

Module III

Historical Roots of Women's Movements in India and global – Right to vote –Women's Question and social reform in 19th early 20th Century in India and Kerala –Women in National Movement – Left Movement- The Contemporary Women's Movements in India – Queer movements – International human rights instruments & UN conventions on gender rights, Indian Constitutional guarantees of equality and citizenship rights – gender in higher Education

1. History of Doing, Radha Kumar, Kali for Women, New Delhi

2. Mapping of Women's Movement, Threfall. M. (Ed.). Verso, London

3. Women, Ecology and Culture: Gabriele Dietrich, P. 72- 95, Gender and Politics in India, Kali for Women

4. Saksham Report on Measures for Ensuring the Safety of Women and Programmes for Gender Sensitisation on Campuses, 2013,

https://www.ugc.ac.in/pdfnews/5873997_saksham-book.pdf

Module IV

Gender perspectives on popular culture, discourse and practices of cinema, television, popular music, magazines and advertisements, representations of women and gender/sexual minorities in media, gendered dimensions of social media – analysis of gender in news – print, television, web and women's media initiatives

Suggested Readings

1. Whose News: The Media and Women's Issues, Ammu Joseph & Kalpana Sharma

(Ed), Sage Publishing, 2006

2. Films and Feminism - Essays in Indian Cinema - Jasbir Jain and Sudha Rai (Ed.),

Rawat Publications.

Suggested Activities

1. Analysis of popular films – films for analysis: (1) The Great Indian Kitchen

(Malayalam), Thappad (Hindi)

2. Analysis of (1) commercial television advertisements (2) Matrimonial Classifieds in

Malayalam Newspapers.

References

3. Understanding Gender: Kamala Bhasin, Women Unlimited, New Delhi

4. What is Patriarchy? Kamala Bhasin, Women Unlimited, New Delhi

5. Exploring Masculinity, Kamala Bhasin, Women Unlimited, New Delhi

6. History of Doing, Radha Kumar, Kali for Women, New Delhi

7. Gendering caste through a feminist lens, Uma Chakravarti, Sage Publications

8. Feminism in India, Maitreyi Chaudhuri (Ed.), Women Unlimited, New Delhi 2005

9. 50 Key concepts in Gender Studies, Jane Pilcher and Imelda Whelehan, Sage Publications

10. Feminism, Jane Freedman, Buckingham Open University Press, Buckingham, 2001,

11. Mapping of Women's Movement, Threfall. M. (Ed.). Verso, London

12. Anila Agarwal, Human Rights for survival of civilization, Kalinga Publication, Delhi

(2004).

13. V.N. Shukla's Constitution of India, Eastern Book Company, 13thedn.

14. Who's News? Ammu Joseph and Kalpana Sharma, Sage Publications, New Delhi,

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Link for Syllabus and Question Bank:

Syllabus: Audit Course Syllabus

Question Bank: Audit Course Question Bank

Subject Name: Intermediate Skills Enrichment Syllabus Code: ISE
Subject Code: SEP 02 Total: 15 Hours
Program Objective: To make the students aware of their career choices and competencies required to be successful in their domain and equip them with the required skills
Course Outcome:
To equip the students with the skills required to excel in their respective domains.

MODULE 1: Session 1-3 (Logical Reasoning) 3 hrs.
➢ Coding – decoding
➢ Series missing number
➢ Statements & Assumptions
➢ Statements & Arguments
MODULE 2: Session 4-6 (Logical Reasoning) 3 hrs.
➢ Blood relations
➢ Matrix arrangement
➢ Analogy Test
MODULE 3: Session 7-8 (Logical Reasoning) 2hrs.
➢ Direction & ranking
➢ Cause and effect
➢ Syllogism
MODULE 4: Session 9-11(Verbal Reasoning) 3 hrs.
➢ Reading comprehension
➢ Vocabulary – synonyms & antonyms
MODULE 5: Session 12-14 (Verbal Reasoning) 3 hrs.
➢ Jumbled words
➢ Idioms & phrases
Assessment Test -1 Hour at the end of semester

Semester V

BCS5B08 - Java Programming
No. of sessions: 96

Course Objectives
1.To understand the concepts and features of object oriented programming
2.To examine key aspects of java Standard API library such as util, io
3.To provide basics of multithreading, exception handling and database connectivity etc
4 To impart the techniques of creating GUI based applications.
Course Outcomes
CO1: Apply object oriented programming features and concepts for solving given problems.
CO2: Able to use java standard API library to write complex programs .
CO3: Implement object oriented programming concepts
CO4: Implement Exception Handling and database connections in java.
CO5: Use graphical user interface and Event Handling in java

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
CO1	2	2	1	3	1	3	3	3	3
CO2	3	3	0	3	2	3	2	3	1
CO3	2	3	1	2	1	2	3	2	2
CO4	2	3	0	2	3	3	2	2	2
CO5	3	2	0	3	1	2	2	2	1

Unit I

Introduction to OOPS, Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming, basic principles of Object Orientation-class, object, abstraction, encapsulation, inheritance, polymorphism, modularity, and message passing. Features of object orientation - attributes, state, identity, operation, behaviour.

Unit II

Introduction to Java: History, Versioning, The Java Virtual Machine, Byte code, writing simple java program, Language Components: Primitive Data Types, Comments, Keywords, literals, the break Statement, the continue Statement, Operators – Casts and Conversions, Arrays. Introduction to classes and methods, constructors, Passing Objects to Methods, Method Overloading, Static and final, This Reference, finalize, inner and nested classes. Inheriting class, extends, member access and inheritance, super keyword, Object class. Dynamic method dispatch, method overriding, abstract class, interface, packages, import statement.

Unit III

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Exceptions, I/O and Threads Input and Output in Java: The File Class, Standard Streams, Keyboard Input, File I/O Using Byte Streams, Character Streams, File I/O Using Character Streams - Buffered Streams, File I/O Using a Buffered Stream, Keyboard Input Using a Buffered Stream, Writing Text Files. Threads: Threads vs. Processes, Creating Threads by Extending Thread, Creating Threads by Implementing Runnable, Advantages of Using Threads, Daemon Threads, Thread States, Thread Problems, Synchronization. Exceptions: Exception Handling, The Exception Hierarchy, throws statement, throw statement, Developing user defined Exception Classes- The finally Block.

Unit IV

Database Connectivity & Applets: Introduction to JDBC: The JDBC Connectivity Model, Database Programming, connecting to the Database, creating a SQL Query, Executing SQL Queries, Getting the Results, Updating Database Data, Executing SQL Update/Delete, The Statement Interface, The ResultSet Interface, ResultSetMetaData. Introduction to GUI Applications - Applets - Types of Applet, Applet Skeleton, Update method, repaint Methods, Html Applet tag and passing parameter to applet.

Unit V

Events and GUI Applications: Event Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter Classes. Java Desktop Applications, Introduction to the AWT, Overview of the AWT, Structure of the AWT, The AWT hierarchy, Containers, Components, Canvas, Frame Working with: Color, Font, FontMetrics, Simple Graphics- Point, line, Rectangle, Polygon, Controls - Button, , Checkbox, Choice, , Label, List, Scroll bar, TextArea, TextField, Layout Manager, MenuBar, Menu, MenuItem , Checkbox MenuItem.

Text Books

1. Herbert Scheldt, Java The Complete Reference, 8th Edition, Tata McGraw-Hill Edition, ISBN: 9781259002465

References

1. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata McGraw Hill Education Private Limited, ISBN: 007014169X.
2. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024. 3. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise in a Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 0596101422.

Open Courses (XXX5DXX)

BCS5D01 - Introduction to Computers and Office Automation

Course Objective
1. Understand the terms hardware, software, I/O devices, Networks - LAN, MAN & WAN
2. Understand the features of MS Word
3. Understand the features of MS Excel
4. Understand the features of mS PowerPoint
Course Outcome
1. Facilitate the ability to use computers in day to day life.
2. Use the features learned, while preparing documents.
3. Use the features learned,while preparing worksheets.
4. Use the features learned,while creating presentations.

PO-CO mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3

Unit I

Introduction to Computers: Types of Computers - Desktop, Laptop, Notebook and Netbook. Hardware: CPU, Input / Output Devices, Storage Devices – System - Software - Operating Systems, Programming Languages, Application Software - Networks - LAN, WAN - Client - Server.

Unit II

Documentation Using a Word Processor (OpenOffice Writer / M.S. Word) - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features - Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Unit III

Electronic Spreadsheet (Open Office Calc/MS-Excel) - Introduction to Spreadsheet, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advanced features – Pivot table & Pivot Chart, Linking and Consolidation.

Unit IV

Presentation using (OpenOffice Impress/MS-Power Point): Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Charts, Word Art, layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

References:

1. Michael Miller, Absolute Beginner's Guide to Computer Basics, Prentice Hall.

2. Russell A. Stultz, Learn Microsoft Office, BPB Publication.

3. H.M.Deitel, P. J. Deitel, et al., Internet & World Wide Web - How to program, Prentice Hall.

Semester VI

1. BCS6B11 – Android Programming

  No. of sessions: 80

Course Objectives
1. Understand the basic concepts of Android programming.
2. Understand the different types of resources in Android.
3. Develop user interface for Android application.
4. Understand the concept of Menu, Fragment and ActionBar in Android.
5. Understand the concept of persisting data in files and SQLite databases.
Course Outcome
1. Explain the basic concepts of Android programming.
2. Identify the different types of resources in Android.
3. Design user interface for Android application.
4. Explain the concept of Menu, Fragment and ActionBar in Android.
5. Develop an application with database connectivity using Android.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

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CO1	3	2	1	3	3	3	3	3	3
CO2	3	2	1	3	3	3	3	3	3
CO3	3	2	1	3	3	3	3	3	3
CO4	3	2	1	3	3	3	3	3	3
CO5	3	2	1	3	3	3	3	3	3

Syllabus

Unit I

Introducing the android computing platform, History of android, an- droid software stack, developing end user application using Android SDK, Android java packages, setting up the development environment, installing android development tools(ADT), Fundamental components, Android virtual devices, Running on real device, Structure of android application, Application life cycle.

Unit II

 Understanding android resources - String resources, Layout resources, Resource reference syntax, Defining own resource IDs - Enumerating key android resources, string arrays, plurals, Colour resources, dimension resources, image resources, Understanding content providers - Android built in providers, exploring databases on emulator, architecture of content providers, structure of android content URIs ,reading data using URIs, using android cursor, working with where clause, inserting updates and deletes, implementing content, Understanding intents basics of intents, available intents, exploring intent composition, Rules for Resolving Intents to Their Components, ACTION PICK, GET CONTENT, pending intents.

Unit III

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User interfaces development in android - building UI completely in code, UI using XML, UI in XML with code, Android's common controls - Text controls, button controls, checkbox control, radio button controls, image view, date and time controls, map view control, understanding adapters, adapter views, list view, gridview, spinner control, gallery control, styles and themes, Understanding layout managers - linear layout manager, table layout manager, relative layout manager, frame layout manager, grid layout manager.

Unit IV

Android menus - creating menus, working with menu groups, responding to menu items, icon menu, sub menu, context menu, dynamic menus, loading menu through XML, popup menus, Fragments in Android structure of fragment, fragment life cycle, fragment transaction and back stack, fragment manager, saving fragment state, persistence of fragments, communications with fragments, startActivity() and setTargetFragment(), using dialogs in android, dialog fragments, working with toast, Implementing action bar - tabbed navigation action bar activity, implementing base activity classes, tabbed action bar and tabbedlistener, debug text view layout, action bar and menu interaction, list navigation action bar activity, spinner adapter, list listener, list action bar, standard navigation action bar activity, action bar and search view, action bar and fragments.

Unit V

Persisting data - Files, saving state and preferences - saving application data,creating, saving and retrieving shared preferences, preference framework and preference activity, preference layout in XML, native preference controls,preference fragments, preference activity, persisting the application state, including static files as resources, Working with file system, SQLLite - SQLLite types,database manipulation using SQLLite, SQL and database centric data model for Android, Android database classes.

References:

1. Satya Komatineni & Dave MacLean,Pro Android 4, Apress.

2. Retomeier, Professional Android 4 Application Development, Wrox.

3. Zigurd Mednieks, Laird Dornin, G. Blake Meike, and Masumi Nakamura, Programming Android, O'Reilly

BCS6B12 -Operating Systems

No. of sessions: 80

Course Objectives
1.To learn objectives & functions of Operating Systems
2.To understand processes and its life cycle.
3.To learn and understand various Memory and Scheduling Algorithms.
4.To have an overall idea about the latest developments in Operating Systems
Course Outcomes
CO1: Learn the basic concepts of operating systems. and about process management
CO2: Understand and experience the UNIX commands and language constructs in building shell scripts
CO3: Able to compare different process scheduling algorithms and process synchronization
CO4: Learn and apply different memory management techniques
CO5: Discuss various protection and security aspects and awareness on mobile operating systems

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	2	0	3	2	3	2	2	3

CO2	3	2	1	3	3	2	3	3	3
CO3	3	2	1	2	3	2	2	3	3
CO4	3	3	0	2	2	3	2	2	2
CO5	2	3	1	3	2	2	2	3	3

Unit I

Operating System - Objectives and functions - The Evolution of Operating Systems: Serial Processing, Simple batch Systems, Multi Programmed batch Systems, Time Sharing Systems, Parallel Systems, Distributed Systems, Real time systems. Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads, Concurrency, Principles of Concurrency, Mutual exclusion, Semaphores, Messages, Deadlock: Prevention, Detection, Avoidance.

Unit II

Linux Shell Programming: Introduction – Shells available in Unix: Bourne shell (sh), C shell (csh), TC shell (tcsh), Korn shell (ksh), Bourne Again SHell (bash). Bash: special characters – getting help – man pages – Linux Directory Layout – Command for Navigating the Linux Filesystems: pwd, cd, ls, file, cat, cp, mv, mkdir, rmdir, whereis – Piping and Redirection - Informational Commands: ps, w, id, free – clear, echo, more. File permissions – Setting Permissions – Making a file executable. Creating shell programs: comments, variables, operators (arithmetic, relational, logical) – single and double quotes - read – echo – test - conditional commands, iterative commands – break – continue - evaluating expressions using expr, bc – strings – grep – arrays.

Unit III

CPU Scheduling: Scheduling Criteria, Scheduling algorithms: FCFS, SJF, Priority, RR, Multilevel, Feedback Queue - Process synchronization, The Critical Section Problem, Synchronization Hardware, Classical Problems of Synchronization: Reader Writer, Dining Philosopher. File and Database System, File System, Functions of organization, Allocation and Free Space Management

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Unit IV

Memory Management, Address Binding, Logical Vs Physical Address Space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand Paging, Page Replacement, Thrashing.

Unit V

Protection and security: policy and mechanism, authentication, authorization. Mobile OS: Concepts, history, features, architecture, future scope. Case studies: Android, UNIX kernel and Microsoft Windows NT (concepts only).

Text Books

1. Silberschatz, Galvin and Gagne, Operating System Concepts, John Willey & Sons
2. William Stallings, Operating Systems, Internals and Design Principles, PHI
3. Mendel Cooper, Advanced Bash-Scripting Guide, Available at http://www.tldp.org/LDP/abs/abs-guide.pdf

BCS6B16d Computer Graphics   **No. of sessions: 80**

Course Objectives
1. To learn the basics of computer graphics
2.To learn the applications of Computer graphics in various contexts
3.To equip the students to execute graphics algorithms and and solve simple problems
4.To learn the basics of GIMP
Course Outcomes
CO1:Students will be able to learn the basics and applications of computer graphics
CO2: Students will be able to understand line drawing and filling algorithms
CO3: Students will be able to understand various 2D transformations
CO4: Students will be able to understand line and polygon clipping algorithms
CO5: Students will be able to learn the basics of color models and GIMP

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	0	1	2	2	1	1	1	1
CO2	3	2	2	1	1	1	2	2	1
CO3	3	2	0	2	2	2	2	2	1
CO4	3	2	2	1	1	1	2	2	1
CO5	3	2	2	3	3	3	3	3	3

Unit 1

Introduction to computer graphics definition, Application, Pixel, Frame Buffer, Raster and Random Scan Display, Display Devices CRT, Color CRT Monitors, basics of LCD and LED Monitors

Unit 2

Scan Conversion of Line, DDA Algorithm of Line Drawing, Scan Conversion of Circles- Bradenham's Circle Generating algorithm, Polygon Filling, Scan Line Polygon Filling

Algorithm

Unit 3

Two-Dimensional Transformation, Translation, Rotation, Scaling, Homogeneous Coordinates, Reflection, Shear

Unit 4

Window to Viewport Transformation, Clipping, Line Clipping, Cohen Sutherland Line Clipping, Polygon Clipping, Sutherland and Gray Hodgman Polygon Clipping Algorithm.

Unit 5

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Color Models and Color Applications Light and Color, Different color models, RGB, CMY,,YIQ. Introduction to GIMP, Image Manipulation Using GIMP.

BCS6B14 -Programming Laboratory III: Java and PHP Programming

Course Objectives
1.To practice Java programming
2.To provide basics of JAVA programs and its execution
3.To practice client side and server side scripting
4 .To practice developing dynamic websites
Course Outcomes
CO1: Able to apply OOP in problem solving and develop basic programs.
CO2: Able to develop basic programs on multithreading and exception handling
CO3: Able to create GUI based applications using applets
CO4: Students able to implement dynamic websites using PHP
CO5: Able to develop Web applications with Database Connectivity.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	1	3	2	3	3	2

CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	3	3	3	3
CO5	3	2	3	1	3	3	3	3	3

Part A-Java Programming

1. Write a program to find the distance between two points.
2. Write a program to find the sum, difference, product, quotient and remainder of two numbers passed as command line argument.
3. Write a java program to display Fibonacci series up to a limit.
4. Write a java program to display Armstrong numbers within a range.
5. Given the sides of a triangle, write a program to check whether the triangle is equilateral, isosceles or scalene and find its area.
6. Read an array of 10 or more numbers and write a program to find the
a) Smallest element in the array
b) Largest element in the array
c) Second largest element in the array
7. Write a program to perform base conversion
a) Integer to binary
b) Integer to Octal
c) Integer to Hexadecimal
8. Write a program to verify De Morgan's Law
9. Write a program to merge two arrays.
10. Write a program to find the trace and transpose of a matrix
11. Write java program to find the sum of the digits and reverse of a given number using class and objects.
12. Write a program to sort a set of n numbers using a class.
13. Create a class „Account‟ to represent a bank account. Write a program to deposit and withdraw amounts from the account.
14. Using class and objects, write a java program to find the sum of two complex numbers (Hint: Use object as parameter to function).
15. Create a class Time with hh, mm, ss as data members. Write a java program to find the sum of two time intervals (Hint: Use object as parameter to function).

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16. Write a program to count and display total number of objects created to a class (Hint: static members).

17. Write a java program to find the volume of cube, rectangular box, cylinder using function overloading.

18. Create a class student with methods to read and display the student details. Create a derived class result with methods to read marks of 5 subjects. Write a java program to display the total and grade of students, creating objects of class result.

19. Create a class Employee with ID, Name Designation and Dept. Create a child class salary with Basic, HRA, DA and Allowance. Write a program to compute the net salary assuming that HRA is 1250, DA, Allowance are 110% and 35% of the Basic salary.

20. Write a program to demonstrate inheritance hierarchy by using class a base class shape and 'TwoDim' and 'ThreeDim' as sub classes. Create classes „square" and 'triangle' derivedfrom TwoDim and 'sphere and 'cube' derived from ThreeDim. A reference variable of shape is used to determine area of various shapes.

21. Write a program to demonstrate the order in which constructors are invoked in multilevel inheritance.

22. Create an abstract class shape with two data members and an abstract method area. Create two child classes rectangle and triangle. Write a program to display the area of the shapes.

23. Create an interface calculator having methods to perform basic arithmetic operation. Write a program to implement the interface to perform operation on integer and float values.

24. Create a class factorial with a method that accept a number and return its factorial in a package P1. Using the factorial class, write a program to find the factorial of a number.

25. Write a multi thread java program for displaying odd numbers and even numbers up to a limit (Hint : Implement thread using Runnable interface).

26. Write a multi thread java program for displaying numbers ascending and descending order (Hint: create thread by inheriting Thread class).

27. Write a program to handle arithmetic exception.

28. Create a user defined exception „MinBalExp" to be invoked when the read number is less than a pre-set value.

29. Create a user defined exception „OddValExp" to be invoked when the read number is an odd number.

30. Write a program to copy a file to another. Pass the file names as command line arguments

31. Write a program to track keyboard events on an applet.

32. Write an applet to display a rectangle with specified coordinate and colour passed as parameter from the HTML file.

33. Create an AWT application to add, remove items in a list box.

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34. Create an AWT application to select gender using radio buttons.
35. Design a window to accept the qualifications of a user using checkboxes.
36. Create an applet for a displaying smiling face.
37. Write a program to display ip address of the system.
38. Write a program to implement echo server (A server that echo the messages the client sends).
39. Create a database table employee (id, name, design, dept). Write a program to list the employees using JDBC.
40. Write a program to insert a new employee record to the above table

Part B-PHP Programming

HTML and CSS

1. Design a website of an educational institution using framesets and links. A sample design is as shown below.

Top Frame	
Menu Frame	Details Frame

2. Design a webpage that illustrates the use of the following form controls: (i) input controls: single-line text, password, multi-line text. (ii) buttons: submit and reset.
3. Design a webpage that illustrates the use of the following form controls: (i) input controls: check box, radio button, select box (ii) buttons: submit and reset.
4. Design a webpage that illustrates the use of the following form controls: (i) input controls: datalist, multi-select box, grouped select box (ii) buttons: submit and reset.
5. Design a webpage that illustrates the use of field sets and legends.
6. Design a web page to demonstrate Border colors using internal CSS.
7. Design a web page to demonstrate Text alignment using CSS.
8. Design a web page to demonstrate inline CSS.
9. Design a webpage to invert the behavior of the <h1> to <h6> tags using external CSS.
10. Design a webpage for a simple image gallery

JavaScript

11. Write a javascript program to perform find the area and circumference of a circle

12. Write a javascript program to check whether a given number is perfect, abundant or deficient. Use alert box to display the output.

13. Write a javascript program to check whether the given sides can form a triangle. If yes, find the type (isosceles, equilateral and scalene) and area of the triangle. Use prompt dialogue box to accept the sides.

14. Write a javascript program to display the nth prime number. Value of n should be accepted from the user. Validate the value entered by the user: Only positive numbers except 0 are to be accepted.

15. Write a JavaScript program to find all years in which 1st January is a Sunday between a given range (eg:- between 2010 and 2017). Use

16. Design a webpage to illustrate image rollover.

17. Design a JavaScript program to illustrate the following events: onLoad, onClick, onBlur,onSubmit, onChange.

18. Design a JavaScript program to display the multiplication table of a no accepted from the user.

19. Design a form that accepts two integers. Provide 4 buttons for Add, Subtract, Multiply, Divide. Add JavaScript program to add, subtract, multiply and divide the given numbers when these buttons are clicked. Use output element to display the results.

20. Write a JavaScript program to create a table after accepting row and column numbersfrom the user. Contents of each cell should be corresponding row-column number (e.g. Row-0 Column-0).

21. Write a JavaScript program to store different colors in an array and change the background color of the page using this array elements

22. Write a JavaScript program to create clock with a timing event.

23. Write a JavaScript program for form validation for question numbers 2, 3 and 4.

24. Design a webpage to demonstrate the use of progress HTML element

PHP

25. Write a PHP program to check whether the given number is Armstrong or not.

26. Write a PHP program to check whether a given number is perfect, abundant or deficient.

27. Display the Fibonacci series up to a given number.

28. Create a php program to display the bio data of a person by reading the personal details using an HTML page.

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29. Create a login page using database.

30. Create a mysql table student with fields roll no, name, mark, grade. Insert records in the table. Write a PHP program to display the mark list of a student by accepting the register no of the student.

31. Write a php application to generate the pay slip of an employee by accepting name, basic salary and designation. The net salary will be calculated based on the following conditions.

Designation	conveyance allowance	extra allowance
Manager	1000	500
Supervisor	750	200
Clerk	500	100
Peon	250	

HRA – 25 %

Income tax

Gross <=200 0

2500 < gross <=4000 3%

4000< gross <=5000 5%

Gross >5000 8%

Gross= basic + HRA + conveyance + extra

Net = gross – income tax

32. Create a table "product" with fields item code, itemname, unit price. Write php program to insert 5 records into the table and display it in a table format.

33. Write a php program for delete and update operation on the account table. The account table contain fields such as accountno, name and amount.

34. Write an HTML page to display a list of fruits in a list box. Write php program to display the names of the fruits which are selected by the user.

35. Write php program to store current date/time in a cookie and display the "last visited on,, date time on the web page upon reopening of the same page.

36. Design a PHP page to implement a login screen using sessions. Login details are to be verified from the server side with values stored in a database.

37. Write a php program to create an array and store 10 names in the array. Do the following operations.

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a. Display the contents using for each statement.

b. Display the array in a sorted order.

c. Display the array without the duplicate elements

d. Remove the last element and display

e. Display the array in reverse order

f. Search an element in the given array.

38. Design a PHP page to illustrate the use of keygen HTML element.

39. Design a PHP page to illustrate the use of meter HTML element – accept five cities and the temperature of those cities and display the result graphically.

40. Design a PHP page to illustrate the use of file upload – uploading files of a type with a specified size to the web server.

Include any 20 Java Programming Lab questions and 20 PHP Programming Lab questions in the record book.

Note: All lab works should be neatly recorded in a Laboratory Record Book in written form. However, Program results can be pasted in the left hand side of the fare record. All students should have a rough record (observation notebook) too, in which they write all the works to be carried out in the lab prior to his/her entering the lab. He/She may also note down the i/p and o/p that he gives for program verification in the observation notebook (rough record).

BCS6B15 -Programming Laboratory IV: Android and Linux Shell Programming

Course Objectives
1.To practice Android programming.
2.To practice user interface applications
3.To practice shell programming
4 .To introduce LINUX basic commands

Course Outcomes
CO1:Able to develop user interface applications
CO2:Apply the knowledge acquired on developing various mobile application using Android
CO3:Students will be able to understand the basic commands of Linux operating system and can write shell scripts
CO4:Create or design different scripts using shell programming.
CO5:Able to write simple and complex shell scripts to automate various tasks using shell programming

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	1	3	2	3	3	2
CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	3	3	3	3
CO5	3	2	3	1	3	3	3	3	3

Part A: Android Programming

1. Programs to understand basic arithmetic operations

2. Programs to understand basic logic operations

3. Programs to understand loops and control statements

4. Programs to understand GUI in android

5. Android application for adding two numbers

6. Develop simple user interface to display message

7. Create two menu items-opening a file-saving a file

8. Inserting values into Spinner control using Text view and Button.

9. Implementation of background image

10. Starting another activity from your own activity using intent

11. Create a new activity that services ACTION-PICK for contact data which display each of the contact in the contact database and lets the user to select one before closing and returning the selected contacts URL to the calling activities

12. Create Android application to linkify a text view to display web and E-mail address as hyperlinks. When clicked they will open the browser and E-mail address respectively

13. Implementation of array adapter

14. Create an alert dialogs used to display a message and offer two button options to continue. Clicking either button will close the dialog after executing the attached click listener

15. Get data from Text view control and insert into database using SQLite. Another activity shows inserted data in a List View control

16. Load menu item by parsing XML data.

17. Program to implement simple calculator

18. Program to Get IP Address

19. Program to Home and Lock Screen Widget (Temperature Widget)

20. Create a new contact using intent

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21. A Button control shows Date picker and Text view control displays selected date.

22. Insert data into Spinner and delete selected item using SQLite.

23. Program to create simple login screen.

24. Create an Android application to display the map of your locality. Use ACTION_VIEW intent by passing latitude and longitude as parameters.

25. Create an Android application to convert a voice into text (using Google Speech to Text service)

26. Create an Android application to populate a list view by getting names & numbers from a SQLite database table.

27. Display the saved contacts available in the android phone in a listview using content providers

28. Create an image grid. Images should be placed under the resources section.

29. Create an android app with three tabs. First tab should contain two Edit text and that should accept age and name. In the second tab you need another 3 edit texts that accept education address and phone number. After these information is proved, when the third tab is open it should display all the provided information neatly.

30. Create a custom toast with an Image and a TextView.

31. Apply a Custom List style to a ListView. ListView should have at least 10 Items.

32. Determine the acceleration of your android device along all three axes using accelerometer? (i.e. x,y,z).

33. Capture an Image from the primary camera of an android device and save that picture into the internal storage.

34. Create an app to list files under a given folder name in an EditText

35. Fetch data from an arbitrary URL given in an EditText and display it in a TextView

36. Create an SQLite database named student. Accept student details from the MainActivity and save it in the table called student. Display the calculated result in the second activity when a

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button on the MainActivity is clicked.

37. Create an android app to switch the wifi on and off also illustrate the use of permission in android?

38. Create a spinner that takes data from the String.xml file.

39. Create a simple android application that opens the default messaging application available in the android device?

40. Create an app to display message in the notification bar?

Part B: Shell Programming

1. Write a script to find area of a circle

2. Write a shell script to find given number is even or odd

3. Write a shell script to make a menu driven calculator using case

4. Write a shell script to find the greatest of three numbers

5. Write a shell script to compute mean and standard deviation of three numbers

6. Write a shell script to find sum of all digits from a given number

7. Write a shell script to find reverse of a number

8. Write a shell script to find prime numbers upto a given number

9. Write a shell script to find n fibonacci numbers

10. Write a shell script to check whether a given number is Amstrong or not

11. Write a shell script to reverse a string and check whether a given string is palindrom or not

12. Write a shell script to count no of line,words and characters of a input file

13. Code for Write a shell program to convert all the contents into the uppercase in a particular file in Unix

14. Write a script to find the value of one number raised to the power of another. Two numbers are entered through the keyboard.

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15. Write a shell script find the factorial of a given number

16. An employee Basic salary is input through keyboard where da is 40% of basic salary and

hra is 20% of basic salary. Write a program to calculate gross salary

17. Write a shell script to find the average of the number entered as command line arguments

18. Code for Shell script which whenever gets executed displays the message Good

Morning / Good afternoon /Good Evening depending on the time it gets executed"

19. Write a shell script to Display Banner, calendar of given year

20. Code for a program to display current date and time, number of users, terminal name, login

date and time

21. Write a shell script which uses all the file test operators

22. Write a shell script to copy the contents of file to another. Input file names through

command line. The copy should not be allowed if second file exists.

23. Write a shell script to find number of vowels, consonants, numbers in a given string.

24. Code for Shell script to perform operations like display, list, make directory and copy,

rename, delete

25. Write a shell script to compare two files and remove one of them if they are same.

Include any 15 Android Programming Lab questions and 15 Shell Programming

Lab questions in the record book.

Note: All lab works should be neatly recorded in a Laboratory Record Book in written form. However, Program results can be pasted in the left hand side of the fare record. All students should have a rough record (observation note book) too, in which they write all the works to be carried out in the lab prior to his/her entering the lab. He/She may also note down the i/p and o/p that he gives for program verification in the observation note book (rough record)

9. Detailed Description of Activities

NCSACT11-Industrial Interaction-Getting ready for placements

Description:The main purpose is to give students an insight into the regular, internal workings of a company.It gives good understanding of the industry and helps in building up useful case studies for improving the quality of future teaching. It provides an ability to identify research programmes of industrial importance.

Course Objectives
To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
Course Outcomes
CO1: To learn as to how theatrical concepts are put into action, thereby aiding their practical learning.
CO2: To enhance interpersonal skills and communication techniques and to become more aware of industry practices and regulations

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	3	3

10. Course Evaluation and CIE

Total marks for each core, elective course is 75 and lab courses shall be 100 marks and Industrial Visit & Project Evaluation cum Programme viva- voce shall be 100 marks and open course shall be 75 marks. The evaluation scheme for each course shall contain two parts (1) Internal evaluation (2) external evaluation. 20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation.

Semester VI

BCS6B17 – Project and Industrial visit

Description: The objective of the B.Sc. Computer Science final project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle (SDLC). The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during five semesters of study in B.Sc. Computer Science Programme. The objective of industrial visit is to give students an insight into the regular, internal workings of a company. It gives good understanding of the industry and helps in building up useful case studies for improving the quality of future teaching. It provides an ability to identify research programmes of industrial importance.

Course Objectives
To provide practical knowledge on software development process
To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
Course Outcomes
CO1: To learn as to how theatrical concepts are put into action, thereby aiding their practical learning.
CO2: To enhance interpersonal skills and communication techniques and to become more aware of industry practices and regulations

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	3	3

EXTERNAL EVALUATION

There shall be University examinations for each course at the end of each semester. Practical examinations shall be conducted by the University at the end of second, fourth and sixth semesters. External evaluation of Project, Industrial Visit Report and Programme viva-voce shall be conducted along with the project evaluation at the end of the sixth semester. External evaluation carries 80% of marks, i.e., 60 marks, for each theory course. The model of the question paper for external examination for theory courses of 2Hours duration:

The students can answer all the questions in Sections A and B. But there shall be Ceiling in each section.

1. Section A: Short answer type carries 2 marks each - 12 questions (Ceiling - 20)

2. Section B: Paragraph/ Problem type carries 5 marks each - 7 questions (Ceiling - 30)

3. Section C: Essay type carries 10 marks (1 out of 2)- (Ceiling - 10)

The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation and answer keys shall be provided by the University. The external examination in practical courses shall be conducted by two examiners, one internal and an external, appointed by the University. The project evaluation with Programme viva voce will be conducted by two examiners, one internal and an external (appointed by the University), at the end of the sixth semester. No practical examination will be conducted in the odd semester. Practical examinations for BCA Programme shall be conducted in the even semesters 2, 4 and 6.

The model of the question paper for external examination (lab courses) of 3 Hours duration shall be:

1. Section A: One marked question of 30 Marks from Programming Lab Part A is to be attempted (Design Algorithm/Flowchart/Interface: 10 Marks, Code: 10 Marks Result: 10 Marks. Total 30 Marks)

2. Section B: One marked question of 30 Marks from Programming Lab Part B is to be attempted (Design Algorithm/Flowchart/Interface: 10 Marks, Code: 10 Marks Result: 10 Marks. Total 30 Marks)

3. Section C: Lab viva voce (Total 10 Marks)

4. Section D: Lab Record (Total 10 Marks)

Project guidelines – Students must be encouraged to do projects in the latest tools or tools appropriate for their topic. Department should conduct a monthly evaluation of the project and give necessary instructions to the students as and when required. Number of students in a project group must be limited to 4. The scheme of evaluation for project cum Programme viva voce shall be

1. Relevance of the Topic, Statement of Objectives (Total 15 Marks)

2. Methodology (Reference/ Bibliography, Presentation, quality of Analysis/Use of Statistical Tools) (Total 15 Marks)

3. Findings and recommendations (Total 20 Marks)

4. Project cum Programme Viva Voce (Total 20 Marks)

5. Report of Industrial visit (Total 10 Marks)

Audit course: The students can attain only pass (Grade P) for these courses. At the end of each semester (up to fourth semester) there will be an examination conducted by the college from a pool of questions set by the University. The students can also attain the credits through online courses like SWAYAM, MOOC etc. The College will send the list of passed students to the University at least before the commencement of fifth semester examination.

EVALUATION AND GRADING

Evaluation (both internal and external) is carried out using Mark system. The Grade on the basis of total internal and external marks will be indicated for each course, for each semester and for the entire programme. Indirect Grading System in 10-point scale is as below:

Ten Point Indirect Grading System

Percentage of marks (Both Internal & external put together)	Grade	Interpretation	Grade point Average (G)	Range of grade points	Class

95 and above	O	Outstanding	10	9.5 - 10	First Class with Distinction
85 to below 95	A+	Excellent	9	8.5 - 9.49	
75 to below 85	A	Very Good	8	7.5 - 8.49	
65 to below 75	B+	Good	7	6.5 - 7.49	First Class
55 to below 65	B	Satisfactory	6	5.5 – 6.49	
45 to below 55	C	Average	5	4.5 – 5.49	Second Class
35 to below 45	P	Pass	4	3.5 – 4.49	Third Class
Below 35	F	Failure	0	0	Fail
Incomplete	I	Incomplete	0	0	Fail
Absent	Ab	Absent 0	0	0	Fail

CURRICULUM FRAMEWORK AND SYLLABUS
FOR OUTCOME BASED EDUCATION IN
Bachelor of Computer Applications (BCA) Degree Program
FOR THE STUDENTS ADMITTED FROM
THE ACADEMIC YEAR 2022 ONWARDS

Naipunnya Institute of Management and Information Technology
(Affiliated to the University of Calicut , Accredited by NAAC with B++,ISO 9001-2015 Certified)
Pongam ,Koratty East , Thrissur District ,Kerala - 680308

Table of Contents

DEPARTMENT OF COMPUTER SCIENCE

VISION

"Be the very pinnacle of academic and research excellence in Computer Applications"

MISSION

As a Department, we are committed to

- Achieve academic excellence in Computer Applications through innovative teaching and learning processes.
- To prepare the students to be professionally competent to face the challenges in the industry.
- Promote inter-disciplinary research among the faculty and the students to create state of art research facilities.
- To promote quality and ethics among the students.
- Motivate the students to acquire entrepreneurial skills to become global leaders.

Courses Offered

- BSc Computer Science
- BCA
- MSc Computer Science

2. Program Outcomes

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Citizenship ethics, and sustainability: Demonstrate empathetic social concern and equity centered national development. Guided by ethics. Promoting social, economic and environment sustainability.

PO4: Use of computer skills: Use the knowledge of computers and information technology for data acquisition and data analysis in experimental investigations and in communication.

PO5. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

4. Programme Specific Outcome

PSO1: Get familiar with the potentially rich and employable field of computer applications

PSO2: Become eligible for higher studies in the area of Computer Science/ Applications.

PSO3: Develop skills in software development to take up self-employment in the Indian and global software market.

PSO4: Get trained and equipped with meeting the requirements of the software industry in the country and outside.

5. PSO-PO Mapping

	PSO1	PSO2	PSO3	PSO4
PO1.Critical Thinking	3	2	3	3
PO2.Effective Communication	3	2	3	2
PO3. Citizenship, ethics and Sustainability	3	3	3	1
PO4. Use of computer skills	2	2	3	3
PO5.Self-directed and Life-long Learning	1	2	2	2

5. Programme Structure

BACHELOR OF COMPUTER APPLICATION
(B. C. A)
(Choice Based Credit and Semester System for Undergraduate Curriculum 2019)

The basic objective of the Programme is to open a channel of admission for computing courses for students, who have done the 10+2 and are interested in taking computing/IT as a career. After acquiring the Bachelor's Degree (BCA) at University of Calicut, there is further educational opportunity to go for an MCA or other Master's Programme like MSc (Computer Science), MSc (IT), MBA, etc., at this university or at any other University/Institute. Also after completing the BCA Programme, a student should be able to get an entry level job in the field of Information Technology or ITES or they can take up self-employment in the Indian & global software market. The specific objectives of the Programme include

Duration: The duration of the BCA Programme shall be six semesters distributed over a period of three academic years. The odd semesters (1, 3, 5) shall be from June to October and the even Semesters (2, 4, 6) shall be from November to March. Each semester shall have 90 working days inclusive of all examinations. Courses: The UG programme shall include five types of courses, viz; Common Courses (Code A), Core courses (Code B), Complementary courses (Code C), Open Course (Code D) and Audit courses (Code E).

Add-on Courses (Code NCSAOC), Bridge Course (Code NCSBC), Additional Certification Courses (Code NCSACC) , walk with the scholar program(NCSWWS) and various activities (NCSACT)   are provided by the department in various semesters in addition to the university's insisted courses.

Credits(C): Each course shall have certain credits. A student is required to acquire a minimum of 140 credits for the completion of the UG programme, of which 120 credits are to be acquired from class room study and shall only be counted for SGPA and CGPA. Out of the 120 credits, 14 credits for common courses (English), 8 credits for additional language courses and 16 credits for General courses. The maximum credits for a course shall not exceed 5. Audit courses shall have 4 credits per course and a total of 16 credits in the entire programme. The maximum credit acquired under extra credit shall be 4. If more Extra credit activities are done by a student, it may be mentioned in the Grade card. The credits of audited courses or extra credits are not counted for SGPA orCGPA. 'Letter Grade" or simply „Grade" (G): in a course is a letter symbol (O, A+, A, B+, B, C, P, F, I and Ab). Grade shall mean the prescribed alphabetical grade awarded to a student based on his/her performance in various examinations. `Credit Point" (P) of a course is the value obtained by multiplying the grade point (G) by the credit (C) of the course: P=G x C. 'Extra Credit" is the additional credit awarded to a student over and above the minimum credits required in a programme, for achievements in co-curricular activities and social activities conducted outside the regular class hours, as decided by the University. For calculating CGPA, extra credits will not be considered.

Attendance: A student shall be permitted to appear for the semester examination, only if he/she secures not less than 75% attendance in each semester. Attendance shall be maintained by the Department concerned. Condonation of shortage of attendance to a maximum of 10% in the case of single condonation and 20% in the case of double condonation in a semester shall be granted by University remitting the required fee. Benefits of attendance may be granted to students who attend the approved activities of the college/university with the prior concurrence of the Head of the institution. Participation in such activities may be treated as presence in lieu of their absence on production of participation/attendance certificate (within two weeks) in curricular/extracurricular activities (maximum 9 days in a semester). Students can avail of condonation of shortage of attendance in a maximum of four semesters during the entire programme (Either four single condonations or one double condonation and two single condonations during the entire programme). If a student fails to get 65% attendance, he/she can move to the next semester only if he/she acquires 50% attendance. In that case, a provisional

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registration is needed. Such students can appear for supplementary examinations for such semesters after the completion of the programme. Less than 50% attendance requires Readmission. Readmission is permitted only once during the entire programme. Strike off the roll: A student who is continuously absent for 14 days without sufficient reason and proper intimation to the Principal of the college shall be removed from the roll.

Ability Enhancement courses/Audit courses: These are courses which are mandatory for a programme but not counted for the calculation of SGPA or CGPA. There shall be one Audit course each in the first four semesters. These courses are not meant for classroom study. The students can attain only pass (Grade P) for these courses. At the end of each semester there shall be an examination conducted by the college from a pool of questions (Question Bank) set by the University. The students can also attain these credits through online courses like SWAYAM, MOOC etc. (optional). The list of passed students must be sent to the University from the colleges at least before the fifth semester examination.

Grace Marks: Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities (in Sports/Arts/ NSS/NCC/ Student Entrepreneurship) carried out besides the regular class hours. Such a benefit is applicable and limited to a maximum of 8 courses in an academic year spreading over two semesters. No credit shall be assigned for such activities. In addition, a maximum of 6 marks per semester can be awarded to the students of UG Programmes, for participating in the College Fitness Education Programme (COFE).

Project: Every student of a UG degree programme shall have to work on a project of 2 credits under the supervision of a faculty member or shall write a theory course based on Research Methodology as per the curriculum. College shall have the liberty to choose either of the above.

Extension Activities: Compulsory social service (CSS) for a period of 15 days is essential for the successful completion of the B.Sc. Computer Science Programme.

PROGRAMME STRUCTURE IN NIMIT

- The Bachelor of Computer Application programme will equip the students with the necessary knowledge and skills for the existing and emerging challenges that a career in computing and software technology will entail.
- In addition it prepares graduates to show high quality of independent thought, flexibility and maturity based on a sound technical knowledge of the field.
- The Bachelor of Computer Application programme aims to provide graduates with the skills and methods needed to create new generations of software applications and to appreciate the technical basis on which they should be built.
- The emphasis throughout is on a thorough understanding of the foundations on which modern development rests, on the software life cycle and project control, on program specification and

implementation, on modern software architectures and on human-computer interaction issues through Mathematical and Statistical concepts.

- After the successful completion of first year, the students will develop problem-solving strategies, techniques and skills that can be applied to computers and problems in other areas which give students an introduction to computer and analytical skills to use in their subsequent course work and professional development. Students will learn in detail about the mathematical foundations for various computer applications and discrete mathematics. Develop proficiency in the C programming language. Develop fundamental ideas of Mathematical Logic. Develop data reduction techniques. Understand probability theory and random variables. Students will also accrue knowledge of various accounting principles and optimization techniques.
- In addition to the university syllabus, students will also learn "Basic Communication skills", "Basics Skill Enrichment Program" and "Advanced Excel". Students will also learn to develop Simple websites using HTML through Mini Projects.
- After the successful completion of second year, the students will be familiar with major algorithms and data structures such as balanced search trees, hash tables, priority queues etc. Be familiar with the role of project management including planning, scheduling, risk management, etc. Understand the approaches to verification and validation including static analysis, and reviews. Be proficient TOC and MY SQL Be able to interpret equations of lines and planes in space expose the real-life applications of Probability distributions. Explain standard error and testing procedures for parameters of a Normal population using large and small samples. Students will also be familiar with Python Programming Microprocessors, Data communication, Sensors and transducers.
- In addition to the university syllabus, students will also learn "Intermediate Skill Enrichment", "Basic OOPs concepts" and "Digital Marketing". Students will also learn to develop Simple Python Applications, Database design in real world organizations and Computer Graphics Algorithms through Mini Projects.
- After the successful completion of third year, the students will, be proficient in Object Oriented Programming and JAVA IDE. Be able to develop and manage a Website. Be familiar with different operating systems. Be able to develop Android applications. Be able to develop quality software solution by following the software engineering principles and practices. Be able to understand, design, and analyze precise specifications of algorithms, procedures, and interaction behavior. Have experience of working in teams to build software systems.
- In addition to the university syllabus, students will also learn "Introductory concepts of Digital Computing", "Advanced Skill Enrichment" and "Introduction to Image Processing and Machine Learning". Students will also learn to develop software's/applications through their final year projects.
- Students will also develop their Aptitude and technical interview skills.
- Students will also learn "Basics Industrial practices and Ethics" through Industrial visits and interactions.

6. Semester wise Courses

Semester	Sl No	Course Type	Course Code	Course Description	Number of Hours
1	1	University Insisted Course	A01	Litmosphere: The World of Literature	72 hrs.
	2		A02	Functional Grammar And Communication In English	72 hrs.
	3		A07	Languages other than English	90 hrs.
	4		BCA1B01	Computer Fundamentals & HTML	64 hrs.
	5		BCA1C01	Mathematical Foundation for Computer Applications	64 hrs.
	6		BCA1C01	Discrete Mathematics	64 hrs.
	7		Audit Course	Environment Studies	-
	7	Add-on Course	NCSAOC1	Communication Skills	30 hrs.
	8	Bridge Course	NCSBC01	Mathematics	20 hrs.
1 & 2	9	Additional Certification Course	NCSACC1	Basics Skill Enrichment Program	30 hrs.
2	10	University Insisted Course	A03	Readings from the Fringes	72hrs.
	11		A04	Readings on Kerala	90hrs.

			A08	Literature in Languages other than English	90hrs.
12					
13			BCA2B02	Problem Solving using C	64hrs.
14			BCA2B03	Programming Laboratory I: HTML and Programming in C	
15			BCA2C03	Financial and Management Accounting	64hrs.
16			BCA2C04	Operations Research	64hrs.
17			Audit Course	Environment Studies	
18	Bridge Course		NCSBC02	Basics of C Programming	20 hrs.
19	Additional Certification Course		NCSACC2	Advanced Excel	5 hrs.
3	20		A11	Python Programming	64 hrs.
	21		A12	Sensors and Transducers	64 hrs.
	22	University Insisted Course	BCA3B04	Data Structures using C	112 hrs.
	23		BCA3C05	Computer Oriented Numerical and Statistical Methods	80 hrs.
	24		BCA3C06	Theory of Computation	80 hrs.
	25		Audit Course	Environment Studies	
	26	Add-on Course	NCSAOC2	Coursera - Python Programming	

3 & 4	27	Additional Certification Course	NCSACC3	Intermediate Skill Enrichment	30 hrs.
4	28	University Insisted Course	A13	Data Communication and Optical Fibers	64 hrs.
	29		A14	Microprocessors-Architecture and Programming	64 hrs.
	30		BCA4B05	Database Management System and RDBMS	112 hrs.
	31		BCA4B06	Programming Laboratory II: Data Structures and RDBMS	
	32		BCA4C07	E-Commerce	80 hrs.
	33		BCA4C08	Computer Graphics	80 hrs.
	34		Audit Course	Environmental studies	
	35	Bridge Course	NCSBC03	Introduction to OOPs Concepts	20 hrs.
	36	Additional Certification Course	NCSACC4	Digital Marketing	5hrs
5	37	University Insisted Course	BCA5B07	Computer Organization and Architecture	64 hrs.
	38		BCA5B08	Java Programming	96 hrs.
	39		BCA5B09	Web Programming Using PHP	96 hrs.
	40		BCA5B10	Principles of Software Engineering	64 hrs.

	41		XXX5DXX	Open Course	48 hrs.
	42	Add-on Course	NCSAOC3	MOOC Course- Introductory concepts of Digital Computing	30 hrs.
5 & 6	43	Additional Certification Course	NCSACC5	Advanced Skill Enrichment	30 hrs.
6	44	University Insisted Course	BCA6B11	Android Programming	112 hrs.
	45		BCA6B12	Operating Systems	112 hrs.
	46		BCA6B13	Computer Networks	80 hrs.
	47		BCA6B14	Programming Laboratory III: Java and PHP Programming	
	48		BCA6B15	Programming Laboratory IV: Android and Linux shell Programming	
	49		BCA6B16X	Elective Course- Software Testing	64 hrs.
	50		BCA6B17	Industrial Visit & Project Work	64 hrs.
	51	Additional Certification Course	NCSACC5	Introduction to Image Processing and Machine Learning	5hrs

Ability Enhancement courses/Audit courses:

Courses	Semester	Credit
Environment Studies	1	4
Disaster Management	2	4
*Human Rights / Intellectual Property Rights / Consumer Protection	3	4
*Gender Studies/Gerontology	4	4

7. Semester wise Activities

Sem	Sl No	Activity Code	Activity Type	Activity Details
1	1	NCSACT01	Ability test	Mathematics
	2	NCSACT02	Ability test	Basic Computer fundamentals
	3	NCSACT03	Mini Project	Computer Fundamentals & HTML
	4	NCSWWS01	WWS	Introduction to JavaScript
2	5	NCSACT04	Competition	PPT presentation on Recent Trends in IT

	6	NCSACT05	Workshop	Introduction to system hardware
3	7	NCSACT06	Mini Project	Python
	8	NCSACT07	Training	Aptitude Training
	9	NCAWWS02	WWS	Research paper Writing
4	10	NCSACT06	Industrial Interaction	Industry Ethics & Practices
	11	NCSACT07	Mini Project	Computer Graphics
	12	NCSACT08	Competition	Research paper review competition
5	13	NCSACT09	Training	Technical Interview preparation
	14	NCSACT10	Seminar	how to become an Entrepreneur
	15	NCSACT11	Industrial Interaction	Getting ready for placements
6	16	NCSACT12	Workshop	Introduction to Manual & Automation testing
	17	NCSACT13	Industrial visit	visit to an IT Industry

8. Detailed Syllabus of Courses with Course Outcomes, Course Objectives and CO-PO/PSO Mapping

Semester 1

ENG1A01: LITMOSPHERE: THE WORLD OF LITERATURE **No. of sessions: 72**

Course Objectives
1. To develop the ability to appreciate life and literature
2. To cultivate an interest in society and culture
3. To envisage creative approach to life and literature

Course Outcomes
CO1: Develop the qualities necessary to become good, kind and responsible human being
CO2: Attain confidence to ask questions
CO3: Apply logical and analytical skills in various situations
CO4: Understand and apply problem solving skills
CO5: Assimilate new perspectives on life
CO6: Enhance the ability to express themselves through writing

CO-PO/PSO Mapping

PO → CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	3	3	3	2	3	2	2	2
CO2	3	3	2	2	3	2	3	2	2
CO3	2	3	2	3	3	2	2	3	2
CO4	3	3	2	3	2	2	2	2	3
CO5	3	3	2	3	3	3	2	2	2
C06	2	3	3	3	2	2	3	2	2

COURSE SUMMARY

Module 1: 14 hrs.

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Module 2: 16 hrs.

Module 3: 14 hrs.

Module 4: 16 hrs.

Evaluation: 12 hrs.

Total: 72 hrs.

COURSE DETAILS:

MODULE 1: Literature- Initiation

1. To Posterity (poem) - Louis MacNeice

2. The Rocking Horse Winner (Short Story) -D H Lawrence

3. "Memoirs of a Mad Man (Prose excerpts from Autobiography)-Gustave Flaubert

MODULE 2: Creative Thinking and Writing

1. The Thought Fox (poem)-Ted Hughes

2. Poetry (poem)-Marianne Moore

3. Excerpt from an Autobiography (Prose)-Agatha Christie

4. Half a Day (Short story)-Naguib Mahfouz

MODULE 3: Critical Thinking

1. To a Reason (Poem) - Arthur Rimbaud

2. The Adventures of the Retired Colourman (Short Story)--Arthur Conan Doyle

3. Trifles (One-Act Play)-Susan Glaspe

MODULE 4: Perspectives

1. Body without the "d" (Poem)-Justice Ameer

2. Sleeping Fool (Poem)-Suniti Namjoshi

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3. The Cockroach (Short Story)-Luis Fernando Verissimo; translated by Anna Vilner

4. About Dalit Literature" (Prose)-Sharankumar Limbale

5. Purl (Short Film)-Kristen Lester

ENG1A02: FUNCTIONAL GRAMMAR AND COMMUNICATION IN ENGLISH

Number of Hours: 90

Course Objectives
1. To identify the key concepts of English grammar.
2. To describe the use of appropriate language through the understanding of the sentence patterns in English.
Course Outcomes
CO1: Demonstrate the ability to use the syntactic structures within English texts.
CO2: Distinguish logical and analytical skills in the use of language for communication.
CO3: Develop writing skills in various professional and career related situations
CO4: Formulate the basic skills in spoken communication in formal contexts

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

CO ↓									
CO1	3	3	3	2	2	3	2	3	2
CO2	3	3	2	1	3	3	3	3	1
CO3	3	1	2	1	2	3	3	3	3
CO4	1	3	2	3	1	3	3	3	3

COURSE SUMMARY

Module 1: 26 hrs.

Module 2: 26 hrs.

Module 3: 26 hrs.

Evaluation: 12 hrs.

Total: 90 hrs.

COURSE DETAILS:

Module1: Basic Concepts of Syntax

Word order and Sentence Patterns - Concord/ Subject-Verb Agreement - Types of Sentences based on Functions - Types of Sentences based on Clauses - Transformation of Sentences - Affirmative and Negative Sentences - Connectives- Collocations - Punctuations

Module 2: Basic Functional Aspects of Grammar Use of major tense forms (Emphasis on tense forms in use in everyday transactions) – Use of Active and Passive Voice – Making use of Reported Speech – Use of functional elements in sentences – Articles – Prepositions.

Module 3: Skills for Communication Aspects of Formal Communication – Barriers to Communication – Preparation for Minutes of Meeting – Writing of Memos - Emails – Letter writing – Writing Curriculum Vitae/Resume - Proposals and Statements of Purpose – Reviews - Case Studies – Group discussion – Presentation skills

MAL1A07 (3) Malayalabhashayum Sahithyavum-1   No. of sessions: 90

Course Objectives
1. Implant an interest in Science and literature in students of conventional graduate courses.
2. Make the students to prepare Science essays and studies in Mother tongue.
3. Improve the communication skills and the taste for creative writing.
Course Outcomes
CO1: Inculcate an interest in Mother tongue and regional literature thereby improve their cultural development.
CO2: Improve the language skills.
CO3: Familiarize with Malayalam literature and the stylistic use of language in various periods.
CO4: Improve the basic grammatical structure of language use of students.
CO5: Familiarize with different and varied cultural realms of Kerala culture.

CO-PO/PSO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	3	2	0	1	0	2	3	3	2	2	1	0

CO2	2	2	2	3	1	3	2	3	1	1	2	2
CO3	3	1	2	0	2	2	2	1	1	2	1	2
CO4	2	2	2	1	2	2	3	2	2	1	2	3
CO5	1	2	2	3	1	2	1	1	3	1	2	2

Module 1: Essays
Kalayum Avishkaravum-Nithyachaithanya Yathi,
Njangal Ningalkku Bhoomi Vittal-Siyatil Moopan,
Kandal Jeevitham-Pokkudan

Module 2: Stories
Bonsayikal –Kovilan,
Lola enna American Penkidavu-Pathmarajan,
Vismayachihnangal-Ashitha

Module 3: Travelogue
Kappirikalude Nattil – S K Pottekkattu

Module 4: Poems
Budhanum Njanum Nariyum-Idassery,
Kollendathengane-Sugathakumari,
Meera Padunnu-Sachidanandan,
Pala posilulla Photokal-K G S

HIN 1A 07(3)   **No. of sessions: 90**

Course Objectives

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	Acquaint the students with different forms of thoughts and styles used in Hindi prose writing ,to make them express their thoughts in these different forms.

Acquaint the students with different forms of thoughts and styles used in Hindi prose writing ,to make them express their thoughts in these different forms.

Introduce Hindi one act plays to the students for appreciation and critical analysis.

Help them to develop their creative thinking and writing.

Course Outcomes
CO1:Approach literary texts in terms of genre, gender and the canon
CO2: Understand and use academic conventions: referencing and bibliography.
CO3: The learner will be aware of socio-political and economic conditions of the society from different periods.
CO4:Be familiar with the theoretical foundations of the genre;
CO5:Be able to compare and contrast the genre with other dramatic forms;

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	2	0	2	0	1	2	1	1
CO2	2	2	0	2	0	1	1	2	1
CO3	2	2	0	2	0	1	2	1	1
CO4	2	2	0	1	0	1	1	2	1
CO5	2	2	0	1	0	1	2	1	1

Module 1

Selected prose –

1.Ramvriksh Benipuri – Subhan Khan

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2. Hazariprasad Dwivedi – Bheeshm ko kshama nahin kiya gaya

3.Harishankar Parsaee – Trishanku Bechaara

4. Mohan Rakesh – Yatra ka Romance

 Module 2

One act plays

1.Mamta Kaliya – Jan se pyare

2.Vinod Rastogee – Bahu kee vida

Module 3

3.Swadesh Deepak – Shadee kee Bath

.Omprakash Aditya-Rehearsal

4. BCA1B01 – Computer Fundamentals and HTML   **No. of sessions: 64**

Course Objectives
1. To equip the students with fundamentals of Computer
2. To learn the basics of Computer organization in personal and professional contexts.
3.To equip the students to write algorithm and draw flowchart for solving simple problems
4.To learn the basics of Internet and web page design
Course Outcomes
CO1:Identify and understand the basics of computer organization and gain functional knowledge of the hardware used in computers and how a software is being executed in a computer
CO2: Explain and apply the basic concepts of number systems and the use of Binary, Decimal and Hexadecimal number systems, and demonstrate competence in the conversion of numbers from one representation to another.
CO3: Demonstrate familiarity with Boolean Operations, the Laws of Boolean Algebra, DE Morgan Theorems and the application of Boolean Algebra and Karnaugh Maps to simplify logic circuits.
CO4: Develop problem-solving strategies, Algorithms and Flowcharts that can be applied to computers and

problems in other areas which give students an introduction to computer and analytical skills to use in their subsequent course work and professional development.

CO5: Enable students to understand the internet and develop web page creation using basic HTML Tags and students will be able to create web pages with different styles and formats.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	0	1	3	1	3	3	2	2
CO2	1	0	0	1	0	0	1	1	1
CO3	1	0	0	1	0	0	1	1	0
CO4	3	1	2	2	3	3	3	3	2
CO5	3	1	2	3	3	3	3	3	3

Unit I

Concepts of Hardware and Software: Computer Languages, Language Translators, Features of good language, Basics Computer Organization: Von Neumann Model, Input Unit, Output Unit, Storage Unit, Control Unit, Memory Hierarchy, Primary Storage, Cache Memory, Registers, Secondary Storage Devices, Basics of Hardware Components – SMPS, Motherboard, Add-on Cards, Ports, Memory, Adapters, Network cables, Basic Computer Configuration

Unit II

Number Systems and Boolean Algebra – Decimal, Binary, Octal and Hexadecimal Numbers, Arithmetic involving Number Systems, Inter Conversions of Number Systems, 1"s and 2"s Complements, Complement Subtractions, Digital Codes – Binary Coded Decimal (BCD), ASCII Code ,Unicode, Gray Code, Excess-3 Code. Boolean Algebra: Boolean Operations, Logic

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Expressions, Postulates, Rules and Laws of Boolean Algebra, DeMorgan's Theorem, Minterms, Maxterms, SOP and POS form of Boolean Expressions for Gate Network, Simplification of Boolean Expressions using Boolean Algebra and Karnaugh Map Techniques (up to 4 variables)

Unit III

Fundamentals of Problem Solving – The Problem Solving Aspect, Top-down Design, Definition – Algorithm, Flowchart, Program - Properties of Flowcharts – Flowchart Symbols for Designing Application Programs, Sample Algorithms – Sum, Average, Finding Smallest Number, Checking Odd/Even Number, Prime Number, Quadratic Equation

Unit IV

Basics of Web Design – www, W3C, Web Browser, Web Server, Web Hosting, Web Pages, DNS, URL, Introduction to HTML, XHTML, DHTML, HTTP.

Overview of HTML 5 – Basic Formatting Tags: heading, paragraph, break, underline, bold, italic, superscript, subscript, font and image, attributes: align, color, bgcolor, font face, border, size, navigation links using anchor tag: internal, external, mail and image, lists: ordered, unordered and definition, HTML media tags: audio and video

Unit V

Creating Simple Tables: row, col, heading, cell, border, spanning – Form Controls: Input types – text, password, text area, button, checkbox, radio button, select box, hidden controls, frames and frame sets

CSS: Introduction - Concept of CSS, Creating Style Sheet: inline and internal, CSS Properties, CSS Styling: Background, Text Format, Controlling Fonts - Working with Block Elements and Objects, CSS ID and Class

5. BCA1C02 – Discrete Mathematics   **No. of sessions: 64**

Course Objectives
1. To learn mathematical logic and Boolean algebra.
1.   2. To learn Graph theory and trees.

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Course Outcomes
CO1:To explain basic notions of symbolic logic and prove boolean expressions
CO2: To Perform the operations of union, intersection, complement, and difference on sets using proper notation
CO3: To define the basic concepts of graphs, directed graphs, and weighted graphs and understand Eulerian and Hamitonian graphs
CO4: Will be able to understand the concept of plane graph and theory & is able to understand Eulerian and Hamitonian graphs
CO5: To understand various types of trees and methods for traversing trees.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	0	1	0	3	3	1	2
CO2	3	0	0	1	0	3	3	1	2
CO3	3	0	0	1	0	3	3	1	2
CO4	3	0	0	1	0	3	3	1	2
CO5	3	0	0	1	0	3	3	1	2

UNIT I

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and implementation, Laws of logic, Quantifiers. Set theory: Introduction, concept of set of theory relation, types of relation, equivalence relation.

UNIT II

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Boolean Algebra and its properties, Algebra of propositions & examples, De-Morgan's Laws, Partial order relations, greatest lower bound , least upper bound, Algebra of electric circuits & its applications. Design of simple automatic control system

UNIT III

Graph: Simple and multigraph, Incidence and degree, Isomorphism, Sub graphs and Union of graphs, connectedness, Walks, Paths and Circuits, Euler's Formula, Eulerian graph, Hamiltonian graph, Chromatic Graphs, Planar Graphs, Travelling salesman problem, Complete, Regular and Bipartite graphs, Directed Graphs

UNIT IV

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees, spanning tree algorithms, fundamental. Circuits; spanning trees of a weighted graph: cut sets and cut-vertices; fundamental cut sets; connectivity and separativity; network. Flows; max-flow min-cut theorem.

UNIT V

Plan on graphs, dual graphs, and Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Euler digraphs.

BCA1C01 – Mathematical Foundation for Computer Applications

Course Objectives
1. To learn the basic principles of linear algebra and vectors.
2. To learn the basic principles of differential and integral Calculus.
3. To learn mathematical modeling using ordinary and partial equations.

Course Outcomes
CO1:To Acquire knowledge of the principles of linear algebra and vectors, as well as their application in definite integrals
CO2: To Demonstrate an understanding of matrices and their operations, grasping the fundamental concepts associated with these mathematical structures.
CO3: To Apply the concept of Cayley Hamilton and solve systems of equations, showcasing the practical

application of linear algebra in solving mathematical problems.
CO4: To Analyze the concept of vectors in two and three dimensions, breaking down their components and understanding their geometric and algebraic properties
CO5: To Integrate knowledge to comprehend the basic principles of differential and integral calculus, including definite and indefinite integrals, synthesizing various mathematical concepts for problem solving

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	1	1	3	3	1	2
CO2	3	0	1	1	0	3	3	1	1
CO3	3	0	0	1	1	3	3	1	2
CO4	3	1	1	1	0	3	3	1	1
CO5	3	0	0	1	1	3	3	1	2

UNIT I (12T)
Linear Algebra and Vector Calculus: Matrices: Matrix definition, order of a matrix, types of matrices, addition of matrices, multiplication of matrices, various kinds of matrices, transpose of a matrix.
UNIT II (12T)
Linear system of equations and solutions using gauss elimination, Gauss Jordan, and Gauss Siedel methods. Linear independence and rank, determinants, inverse, Eigen values. Vectors: Vectors in 2- and 3-space, dot and cross products.
UNIT III (14T)
Differentiation: Limits (definition only).Derivative at a point, Derivative of a Function, Differentiation from first principle, Differentiation of important functions, Product rule, Quotient rule, Differentiation of a function of a function (problem based)
UNIT IV (12T)
Integration: Integral as Anti-derivative, Indefinite integral &constant of integration, Fundamental theorems, Elementary Standard results.

UNIT V (14T)

Methods of Integration, Integration through Partial Functions, Integration by parts. Definite Integral: Evaluation by Substitution, Properties of definite integrals (Problem Based)

AUD1E01 ENVIRONMENTAL STUDIES

Course Objectives
1 The study aims at imparting basic knowledge about the environment and its allied problems and acquiring an environmentally conscious mindset.
Course Outcomes
C01:Comprehend the importance of ecosystem and biodiversity
C02:To correlate the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention Identify different types of environmental pollution and control measures
C03:To correlate the exploitation and utilization of conventional and non-conventional resources

Syllabus

Module 1: Introduction – Environment in the Indian context: Concept of an ecosystem, Multidisciplinary nature of environmental studies. Components of environment- Atmosphere, hydrosphere, lithosphere and biosphere. Definition, scope and importance. Concept of sustainability and sustainable development.

Module 2:

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food

Problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. • Role of an individual in conservation of natural resources. Carbon footprint Water conservation, rain water harvesting, watershed management

Module 3:

Structure and function of an ecosystem. • Producers, consumers and decomposers. • Energy flow in the ecosystem. • Ecological succession. • Food chains, food webs and ecological pyramids. • Introduction, types, characteristic

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features, structure and function of the following ecosystem: - a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Module 4:

Biodiversity and its conservation • Introduction – Definition: genetic, species and ecosystem diversity. • Biogeographically classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels. • Hot-spots of biodiversity. • Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. • Endangered and endemic species of India • Conservation of biodiversity:

Module 5:

Environmental Pollution Definition • Cause, effects and control measures of: - a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards • Solid waste Management : Causes, effects and control measures of urban and industrial wastes. • Role of an individual in prevention of pollution.

Module 6:

Environmental Policies and practices: Climate change, Climate change, global Warming, acid rain, ozone layer depletion, nuclear accidents.

NCSAOC01- Communication Skills

Description:
The add on course on **"Communication Skills"** aims to provide the students with increasing the communication skills of students so that they will be able to communicate effectively in English with others. The training will be provided by the Department of English. It is a 30 hour program. Certificate will be provided to the students after successful completion of the course.

Course Objectives
1. Students will develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others.
Course Outcomes
CO1: Understand the relevance of the English language in the contemporary society and how this language acts as a lingua franca in a multilingual context
CO2: Develop language and vocabulary skills relevant to a professional

| CO3: Interpret, summarize and analyze different sorts of textual content |
| CO4: Improve the basic aspects of LSRW and use it accordingly |
| CO5: Create technical and professional documents that are precise and vivid. |

CO-PO/PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	3	0	2	2	3	3	2
CO2	3	2	3	0	2	2	3	3	2
CO3	3	2	3	0	2	3	3	3	3
CO4	3	2	3	0	2	3	3	3	3
CO5	3	2	3	0	2	3	3	3	3

Module 1 (2 hrs.)
Introduction to the English Language: English as the lingua franca: The relevance of using English in multilingual contexts and communication.
English as a non-phonetic language, change in the meaning of words with respect to pronunciation, loan words from other languages such as French, German, and Chinese etc.

Module 2 (4 hrs.)

Grammar: Basic Verb forms, pragmatic usage in sentences, auxiliary verbs, Subject-Verb agreement, common errors in the usage of the English language.

Module 3 (10 hrs.)

Tenses: Present Tense, Past Tense and Future Tense; Sentences: declarative sentences, imperative sentences, interrogative sentences, exclamatory sentences; using different sentence types in your writing, dependent clause, independent clause

Module 4 (5 hrs.)

Sentence types: Simple Sentences, Compound Sentences, Complex Sentences and Compound-Complex Sentences; Practice Questions; Conjunctions, linkers, connectors; degrees of comparison; idioms, onomatopoeic words, acronyms, homophones, Punctuation marks and its uses, the differences that punctuation marks make in a sentence

Module 5 (9 hrs.)

Introduction to LSRW: listening, speaking, reading and writing; Verbal communication, Non-verbal communication, Barriers to effective communication, fluency and accuracy, skimming, scanning, summarizing, paraphrasing

NCSBC01-Bridge Course-Mathematics

Description: The bridge course aims to act as a buffer for the new entrants with an objective to provide adequate time for the transition to hardcore of degree courses. The syllabus for the course is framed in such a way that they get basic knowledge on the subjects which they would be learning through graduation. The course consist of 30 Hrs. of interactive sessions.

Course Objectives
1. To provide students the confidence and skills to successfully transition to new system
Course Outcomes
CO1: To define the basic concepts in mathematics
CO2: To develop academic skills and assist the students in mathematics.

CO-PO/PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

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Unit I

Limits and continuity- Properties of limits-infinite limits-continuity of functions

Unit II

Trigonometric functions: Laws of trigonometric functions-Identities

Unit III

Derivatives- formulas - rules of derivatives- substitution method-chain rule-exponential method

Unit IV

Integration: Formulas-Rules of integration-Application of integration

Unit V

Linear equations: Solution of linear equations Introduction of matrices

NCSACC01- Basic Skill Enrichment program

Description: The additional certification program on "Basic Skill Enrichment Program" is given to students by the Training Department. It is a 30 hour course. Certificate will be provided to students after the completion of the course.

Course Objectives
1. To ensure that 'all education and training develops self-reliance, flexibility and breadth'. Learn the process of setting and reaching through learning the steps to goal setting and applying those steps in real life.
Course Outcomes
CO1: By the end of this program, students will be equipped with all skills needed to successfully face the interview and gets easily hired.

CO-PO/PSO Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	2	3	3	3	3	3

Session 1: Orientation Class - Familiarize with language lab - do's and don'ts, introduce Tell Me More

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Software and its applications, discuss the syllabus.

Session 2: Listening Skill - Listen and draw, word search and crossword puzzle, video & questions.

Session 3: Speaking Skill - I have never, continue the story, and describe the image.

Session 4: Reading Skill - Reading comprehension, word jumble race, sentence pronunciation, Word scramble.

Session 5: Writing Skill - Written expression, fill in the blanks, sentence practice and grammar practice, write story

NCSACT02-Ability test-Basic Computer fundamentals

Description -This test has been designed to assess the ability of a candidate to work using a computer. It tests if an individual is aware of the functions in a computer including basic hardware, and computer fundamentals. The test uses different difficulty levels of questions to accurately identify candidates who understand computer fundamentals.

Course Objectives
1. To understand the basic hardware and software functionalities.
Course Outcomes
CO1: To define the basic concepts computer fundamentals
CO2:.Will be able to understand the common hardware units

CO-PO/PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

NCSACT03-Mini Project-Computer Fundamentals & HTML

Description: It enables the candidate to create a web page using HTML and can also be able to customize an existing web template which is available online. HTML can be used to create the web pages which are available on the web.

Course Objectives
1. To understand the real time software development environment. The student can gain a thorough knowledge in developing a web page using basic HTML tags.
2. Introduces style sheets (CSS) and responsive (mobile) web design.
Course Outcomes
CO1: Use knowledge of HTML and CSS code and an HTML editor to create personal websites following current professional standards.
CO2:.Use critical thinking skills to design and create websites.

CO-PO/PSO Mapping

PO CO	PO 1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

NCSW S01-Walk with the scholar: Introduction to JavaScript

Description: The scheme originally introduced the idea of mentoring, building on the concept of mentor as a "Guide and Friend". The outcome of the programme indicated positive changes in the student participants such as increased self-confidence, improved communication skills, better academic performance, increased awareness regarding higher studies and career options in one's academic field and improved interpersonal functioning. The selection of the students was based on screening of their Marks, Interests, Potentials and Capabilities.

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Course Objectives
1. To help the students to identify a better career option.
Course Outcomes
CO1: To develop certain generic skills, non-technical competencies, attitudes and behaviors
CO2:.To provide necessary orientation, guidance, motivation and support to enrich and nourish their talents.

Introduction, Client side programming, script tag, comments, variables. Including JavaScript in HTML, Data types, Operators, Conditional Statements, Loops, break and continue. Functions and Objects.

Semester 2

ENG2A03: READINGS FROM THE FRINGES No. of hours: 72

Course Objectives
1. To inculcate and apply the concepts of democracy and freedom in life and understand the basic tenets of our constitution
2. To critically think and examine various social issues prevailing in our society
Course Outcomes
CO1: Discuss and contemplate on the areas of gender inequality, marginalization, disability studies, racism and casteism
CO2: Develop sensitivity towards environmental concerns and feel responsible towards protecting nature.

CO3: Understand the everyday realities of the marginalized sections of the society and negate the stereotypes surrounding them and accept them as allies.

CO4: To develop scientific temper and scientific thinking

CO-PO MAPPING

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	1	2	1	1	1	1
CO2	1	3	1	1	2	1	1	1	0
CO3	2	2	1	1	1	0	1	1	0
CO4	2	2	1	2	3	1	1	0	1

COURSE SUMMARY

Module 1: 15 hrs.

Module 2: 15 hrs.

Module 3: 15 hrs.

Module 4: 15 hrs.

Evaluation: 12 hrs.

Total: 72 hrs.

COURSE DETAILS:

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Module 1: Constitution, Democracy and Freedom

1.   "The Objectives Resolution" (Speech excerpt) - Jawaharlal Nehru

2.   "How Many More Days, Democracy" (Poem) - Sameer Tanti

3.   "When Salihan took on the Raj" (Article) - P. Sainath

Module 2: Ecology and Science

1.   "Knowledge is Power"(Excerpt from Chapter 14 of Sapiens: A Brief History of Humankind)- Yuval

Noah Harari

2.   "A White Heron" (Short story) - Sarah Orne Jewett

3.   "The Fish" (poem) - Elizabeth Bishop

4.   "Everything I Need to Know I Learned in the Forest" (essay) - Vandana Shiva

Module 3: Gender Equality

1.   "Fire" - Nikita Gill - Poem

2.   "Accept Me" from I am Vidya: A Transgender's Journey - Living Smile Vidya

3.   Dear Ijeawele (Letter-excerpt) - Chimamanda Ngozi Adichie

Module 4: Human Rights

1.   "Entre-vous to Adulthood" from One Little Finger - Malini Chib

2.   "The Body Politic" (Poem) - Hiromi Goto

3.   "Love- lines in the time of Chathurvarna" (Article) - Chandra Bhan

Prasad

4.   "The History Lesson "(Poem) - Jeanette Armstrong

ENG2AO4: READINGS ON KERALA   No. of hours: 90

Course Objectives
1. To enable the students to read and critically appreciate the different varieties of Kerala literature, writings and films

2. To read and understand the diversity of Malayalam literature and understand its distinctions

Course Outcomes
CO1: Develop critical understanding of literature of Kerala
CO2: Interrelate the cultural and historical tradition of the society and the development of literary sensibility
CO3: Identity the diversity of literary endeavors and the cultural representations
CO4: Identify and apply the insights and values in everyday life as a Keralite
CO5: Critically analyze and interpret the present cultural production

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	1	2	1	0	1	0
CO2	1	1	2	1	3	1	0	1	1
CO3	3	2	3	1	3	1	0	1	1
CO4	3	2	3	1	1	1	1	1	1
CO5	2	2	3	1	1	0	1	1	1

COURSE SUMMARY:

Module 1: Formation 15 hrs.

Module 2: Evolution   22 hrs.

Module 3: Stimulation   16 hrs.

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Module 4: Propagation 25 hrs.

Evaluation 12 hrs.

Total 90 hrs.

COURSE DETAILS:

Module 1: Formation

1.   "History" (Prose) excerpt from Malabar Manual – William Logan

2.   "Tribal Tale of Kerala" (Prose) excerpt from Kerala Culture – Prof S Achutha Warrier

3.   "Ghoshayatra" (Poem excerpt) – Kunchan Nambiar

Module 2: Evolution

1.   Excerpt from Indulekha (Novel) -O. Chandu Menon

2.   Excerpt from "Atmopadeshashathakam" (Poem) - Sree Narayana Guru

3.   "Not an Alphabet in Sight" (Poem) – Poykayil Appachan

4.   "Ayyankali: A Dalit Leader of Organic Protest" (Prose-excerpt) -

M. Nisar,Meena Kandasamy

5.   "Vakkom Moulavi: My Grandfather, the Rebel" (Prose) - Sabin Iqbal

Module 3: Stimulation

1.   "Daughter of Humanity" (Story) - Lalithambika Antharjanam

2.   "Kuttippuram Paalam"(Poem) – Edasseri

3.   "Christian Heritage" (Story) - Vaikom Muhammad Basheer

Module 4: Propagation

1.   "Myth and Literature" (Speech) -M T Vasudhevan Nair

2.   "Rain at Heart" (Poem) –Sugathakumari

3.   "Fifty years of Malayalam Cinema" (Prose) - VC Harris

4.   "Malayalam's Ghazal" (Poem) – Jeet Thayil

5.   "Agni" (Story) - Sithara A

6.   "Pictures Drawn on Water"(poem) - K.Satchidanandan

MAL2A08(3) Malayalabhashayum Sahithyavum-   **No. of sessions: 90**

Course Objectives
1. Realize the different and varied cultural realms
2. Make the students to prepare Science essays and studies in Mother tongue.
3. Familiarize with Malayalam literature and the stylistic use of language in various periods
Course Outcomes
CO1: Familiarize with different literary forms and communication modes of Malayalam.
CO2: Students will be able to enhance their vocabulary.

CO3: Students will be able to demonstrate understanding of grammatical structures in appropriate context.

CO4: Inculcate an interest in Mother tongue and regional literature thereby improve their cultural development.

CO5: Implant an interest in Science and literature in students of conventional graduate courses.

CO-PO/PSO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	0	2	1	3	2	1	3	2	1	0
CO2	2	2	1	3	1	2	2	3	2	1	3	2
CO3	2	1	3	0	2	2	1	1	1	2	1	2
CO4	2	2	1	1	2	2	2	2	2	1	2	3
CO5	1	2	3	3	1	2	2	2	3	2	2	2

Module 1: Stories
Oru manushyan-Basheer,
Vanmarangal veezhumpol-N S
Madhavan,Payaru vallikalil ini nammalokke-Priya A S

Module 2: Novel
Enmagaje-Ambika Suthan Mangad

Module 3: Drama
Bhagnabhavanam-N Krishnapillai
Module 4: Autobiography, Memoire

Pavam manushyan-Cherukadu(Jeevithappatha)
Santhanagopalam-M N Palooru(Kadhayillathavante Kadha)
Ulsavakalam –Chandramathi(Njandukalude nattil oridavela)

HIN2A08(3) Poetry and Short Stories

No. of sessions: 80 hrs.

Course Objectives
1. Appreciation of literature using the best specimens provided as reading list
2. Understanding literary works as cultural and communicative events.
3. Understanding different periods and movements ; literature and society.
Course Outcomes
CO1: Understand the common techniques underlying free verse and traditional forms of poetry
CO2: Identify personal experiences that can be used when writing poems
CO3: Understand the basic terminology and practical elements of poetry.
CO4: Students get to know various cultures and construction of gender, nation and race throughout the history.
CO5: The prescribed fiction helps the students to learn human values and the behavioral patterns from great works of art, and develops the ability to understand human race.

CO-PO/PSO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	0	2	1	3	2	1	3	2	1	0
CO2	2	2	1	3	1	2	2	3	2	1	3	2
CO3	2	1	3	0	2	2	1	1	1	2	1	2
CO4	2	2	1	1	2	2	2	2	2	1	2	3
CO5	1	2	3	3	1	2	2	2	3	2	2	2

Module 1

1 Kabir – 5 Dohas

2.Rahim – 5 Dohas

3.Meera Bai – one pada

4.Jayashankar Prasad –Madhumaya Desh

Module 2

5.Kedarnath singh—Akal mein doob

6 Sarveswar Dayal Saksena –Mukti kee Akanksha

7.Mahendra Bhatnagar –Nayee Naari

8.Gyanendrapathi -Pyasaa Kuan

Module 3

Premchand - Bade Ghar kee Beti

Yashpal – Aadmi Ka Bacha

Module 4

Bheeshm Sahni - Chief kee Dawat Madhukankariya – File

TRANSLATION AND COMMUNICATION IN FRENCH FRE 2A08(2)

Course objective: Improve language skills, learn about culture, and analyze translated texts. By doing this, students will become better at understanding and using the language.

CO1: To ameliorate the level of language proficiency.
CO2: To inculcate the cultural aspect of the region.
CO3: To analyze & evaluate other translated texts.

CO-PO-PSO MAPPING

PO/PSO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	0	2	0	0	0	0	1	1
CO2	1	1	1	0	0	0	1	1
CO3	0	1	0	0	0	0	1	1

Course Outline: 4 Modules

1. Module I: Translation as Communication, translation as transmission, social and cultural factors.

2. Module II: Literary translation, commercial translation from source language to target language and vice-versa.

3. Module III: Analysis of translated texts, treatment of technical terminology in the translated texts. General principles for the translation of key words and culture-specific terms.

4. Module IV: Business translation, translation of advertisements.

TEXTBOOK : La correspondence commerciale francais (Lessons in pages 1to39)

by L.Bas / C.Driot-Hesnard, Nathan, Paris.

BCA2B02 – Problem Solving using C   **No. of sessions: 64**

Course Objectives
1. To equip the students with fundamental principles of Problem Solving aspects.
2.To learn the concept of programming
3.To study C language
4.To equip the students to write programs for solving simple computing problems

Course Outcomes
CO1: Identify and understand the basics of C program structure ,Familiarization of IDE,Tokens,Variable Declaration and how to define symbolic constant.
CO2: Explain and apply the basic concepts of operators and Expressions,Type conversions and operator precedence and associativity.
CO3: Demonstrate familiarity with control structures such as branching, loops and expressions and simple programs
CO4: Develop the ability to create and use functions and to create arrays of elementary objects as well as equip with the basic concepts of Structures and Union and analytical skills to use in their subsequent coursework and professional development
CO5: Enable students to understand the creation and processing of files and command line operations.Student will be able to develop programs and understand a defensive programming concept as well as equip the ability to handle possible errors during program execution.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	3	3	2	3	3	2
CO2	3	0	1	2	1	1	1	1	1

CO3	**3**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**3**
CO5	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

Unit I

Introduction to C Programming - Overview and Importance of C, C Program Structure, Sample programs. Familiarization of Integrated Development Environment - Invoking IDE, Opening a new window in IDE, Writing, Saving and Compiling a C program, making an Executable File. Elements of C Language and Program Constructs: Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable Declaration and Assignment of Values,Symbolic Constant Definition.

Unit II

C Operators - Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations - Library functions.

Unit III

Data input output functions - Simple C programs – Flow of Control - Decision making with IF statement, Simple IF statement, If-else statement, Nesting of If-else and else-if Ladder, Switch statement, Conditional operator, goto statement. Looping - While loop, Do-While, and For Loops, Nesting of loops, jumps in loop, skipping of loops.

Unit IV

Arrays and Strings - One dimensional array, two dimensional and multidimensional arrays, strings and string manipulation functions.The Concept of modularization and User defined functions - Definition - Multifunction Program,proto-types, Passing arguments, calling functions, various categories of functions, Nesting of functions and recursion, functions and arrays, scope and lifetime of variables in functions, multi-file programs.Structures & Union structure definition - giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit fields.

Unit V

Pointers - Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string,

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pointers and functions, pointers and structures, pointer to pointer dynamic memory allocation.Files: Creating, Processing, Opening and Closing a data file, command line operations

BCA2C04 - Operations Research   **No. of sessions: 64**

Course Objectives
1. To get a general introduction in solving linear programming problems.
2.To get a general understanding of network analysis techniques.
3.To get a general understanding of different mathematical models
Course Outcomes
CO1:- To comprehend the meaning of Operations Research (OR) and its various applications in decision making and problem-solving
CO2: To apply graphical and simplex methods to solve Linear Programming Problems (LPP), demonstrating practical problem-solving skills in Operations Research.
CO3: To apply Operations Research techniques to solve transportation problems, showcasing the ability to use quantitative methods in logistics and distribution
CO4: To apply Operations Research methodologies to solve assignment problems and sequencing problems, demonstrating proficiency in optimization and decision-making.
CO5: - To analyze and construct network diagrams, as well as determine critical paths for finding project durations, showcasing higher-order thinking skills in Operations Research

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	1	1	1	2	1	1
CO2	3	1	1	1	1	0	1	1	1
CO3	3	1	1	1	1	0	1	1	1

| CO4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CO5 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

UNIT I

Operation research and LPP: Operation Research and Decision making, Advantages of O.R approach in decision making, Application of O.R, uses and limitations of O.R.

UNIT II

LPP: Introduction, mathematical formulation of the problem, canonical and standard forms of LPP. Simplex method, artificial variable technique - Big M and two phase method - problem of degeneracy - concept of duality - dual simplex method.

UNIT III

Transportation model - North West corner rule, Least cost method, Vogel''s approximation method - loops in transportation table - Degeneracy in transportation table - Transshipment problem.

UNIT IV

Assignment model: Mathematical formulation of the problem - assignment algorithm impossible algorithms - traveling salesman problem

UNIT V

Network Scheduling: Concept of network, basic components, PERT and CPM, Rules of network construction, maximal flow problem, project scheduling critical path calculations, advantages of network (PERT/CPM). Sequencing models: processing n jobs through two machines, n jobs through three machines, two jobs through m machines.

BCA2B03 - Programming Laboratory I: Lab Exam of 1st & 2nd Semester –
HTML and Programming in C

Course Objectives
1.To make the students learn web designing
2.To make the students learn programming environments.
3.To practice procedural programming concepts
4.To make the students equipped to solve mathematical or scientific problems using C

Course Outcomes
CO1:Enable students to understand internet and develop web page creation using basic HTML Tags
CO2: Enable students to create web pages with different styles and formats.
CO3: Develop the students to create programs using basic C programming methods, Decision making statements, branching statements, looping statements and functions.
CO4: Develop the students to create programs using Array, structure , union, pointers and files.

CO-PO/PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3
CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	3	3	3	3

Part A: HTML lab work

List of Exercises:

1) Design a web page to display the information of Computer Science department of your college by using basic page tags. Display the information in the form of paragraphs/sentences. Also use effects to highlight the information like bold, italic or underline.

2) (a) Create a webpage with HTML describing your department. Use paragraph and list tags. (b) Apply various colors to suitably distinguish key words. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.

3) Use the above webpage to

a) Create links on the words e.g. "Wi-Fi" and "LAN" to link them to Wikipedia pages.

b) Insert an image and create a link such that clicking on the image takes the user to another page.

c) Change the background color of the page. At the bottom create a link to take the user to the top of the page.

4) Design a page to display the information in table format. Display the list of colleges offering B.Sc. Computer Science along with the details College Name, Address, Contact no. Address column will consist of sub columns as House Name, Post, City and pin code.

5) Create a webpage to create a photo Album. When the user clicks on the Image and Video Link it should open the corresponding album.

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6) Design web pages which display the product images and its information with it. The products are computers, printers and laptops. The information displayed of the product should be configuration/ technical details, price etc.

(Purpose: - Study image tag. Display image in tabular form along with the other text information.)

7) Design a page to display the B.Sc. Computer Science syllabus by using List tag.

(Purpose: - Introduce list tag to display data in ordered or unordered format as main, sub main, sub-sub main, etc by using nos. or special types of bullets.)

8) Create HTML pages using Hyper Links

i. File Link

ii. Single Page Link

9) Create a hyperlink to show the information and syllabus of B.Sc. Computer Science. When click on the links each page should display the objective of respective course, Lesson plan,

Course duration etc.

(Purpose: - Introduce anchor tag to create links between pages. One can able to transfer the control to next page, previous page or to a specific page like Home page.)

10) Design an HTML page describing your University infrastructure. Use tables to provide layout to your HTML page.

11) Use <span> and <div> tags to provide a layout to the above HTML page instead of a table layout.

12) HTML pages with Tables

i. Use Tables to layout HTML pages

ii. Use <span> and <div> tags to provide a layout to the above page instead of table layout

iii. Use Frames to divide the page contents into different parts

iv. Embed Audio and Video into your HTML webpage

13) Design a page to display the information in table format. Display the list of colleges offering Computer Science along with the details College Name, Address, Contact no.Address column will consist of sub columns as Post Office, City, District and Pin code.

(Purpose: - Introduction of table tags along with the sub columns and other supportive tags like caption, cell spacing, cell padding etc.)

14) Create an HTML page to show the use of Navigation Frame

15) Create an HTML page to show the use of Floating Frame

16) Create an HTML page to show the use of Inline Frame

17) Design web pages to display the information about your college and UG Programmes offered in your college. Divide the page into three frames. The top frame should display the title of the college, left frame shout display the UG Programmes and the right frame display the details of selected programmes like fees, syllabus etc.

(Purpose: - Study frame tag which allows to divide the screen into no of sections.)

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18) Design web pages to accept the student information. Student should enter the details like first name, last name, middle name, city up to 25 characters, and address up to 50 characters. Show the combo box to select the qualification, option button for gender selection. Display the information accepted in a formatted form.
(Purpose: - Study form tag which allow to design the formatted screen to accept the information from the user.)
19) Design a website to show the use of the following input controls
i. Checkbox,
ii. Radio button,
20) Design a website to show the use of the following input controls
i. Select box,
ii. Hidden controls
21) Design CSS style sheet to define settings for heading, body, table and links.
(Purpose: - Study CSS style sheet facility. This allows setting the default settings for all the pages.)
22) Design a webpage to show the use of External Style Sheets

Part B: C Programming
Write programs to do the following:
1. Find the sum of digits and reverse of a number.
2. Find the distance between two points.
3. Find the factorial of a number.
4. Find the Nth Fibonacci number using recursion.
5. Print the reverse of a string using recursion.
6. Solve the problem of Towers of Hanoi using recursion.
7. Find Sin(x) and Cos(x) in the range 0o to 180o (interval 30o) using functions.
8. Create a pyramid using „*".
9. Display the multiplication tables up to the number N.
10. Find the number of words in a sentence.
11. Perform matrix addition, subtraction, multiplication, inverse, and transpose using pointers and functions.
12. Replace a part of the string with another string.
13. Find the power of a number using structure and union.
14. Find the average of prime numbers in a group of N numbers using a function.
15. Find the sum of the series S = 1 + (½)2 + (1/3)3 + ... to 0.0001% accuracy.
16. Display the rightmost digit in a floating point number.
17. Create a pattern with the number N.
e.g. N = 39174 Pattern: 3 9 1 7 4
9 1 7 4
1 7 4
7 4
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18. Display the short form of a string. E.g. Computer Science : CS
19. Currency conversion (any four currencies)
20. Find the currency denomination of a given amount.
21. Prepare a sales bill using an array of structures.
22. Addition and subtraction of complex numbers using structure.
23. Find the armstrong numbers within a given range.
24. Check for palindrome string/number.
25. Check for leap years.
26. Find the number of special characters in a given string.
27. Store and read data from a text file.
28. Write odd and even numbers into separate files.
29. Swapping of two numbers using call-by-reference method.
30. Copy the contents of one file into another one using command line parameters.
31. Base conversion of numbers.
32. Calculate the percentage of marks obtained for N students appeared for examination in M subjects using an array of structures.
33. Display a table of the values of function y = exp(-x) for x varying from 0.0 to N in steps of 0.1
34. Design a Scientific Calculator and include as many functions as possible.
35. Merge two numeric arrays in sorted order.
36. Fill the upper triangle with 1, lower triangle with -1 and diagonal elements with 0.
37. Count the occurrence of different words in a sentence.
38. Convert an input amount into words.
39. Convert a time in a 24 hour clock to a time in 12 hours.
40. Change the date/time format using structure.

AUD2E02 DISASTER MANAGEMENT

Course Objectives
1. The study aims at providing an understanding on disaster management and various types of disasters.
2. It provides an awareness about disaster prevention and risk reduction and enables to impart knowledge on climate change adaptation and scenarios.
Course Outcomes
C01:Understand the need and significance of studying disaster management
C02:Understand the different types of disasters and causes for disasters.

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C03:Gain knowledge on the impacts Disasters on environment and society	
C04: Study and assess vulnerability of a geographical area.	
C05: Students will be equipped with various methods of risk reduction measures and risk mitigation.	

Module 1:

Introduction – Hazard and Disaster. Concepts of Hazard, Vulnerability, Risks. Different Types of Disaster : A) Natural Disaster: such as Flood, Cyclone, Earthquakes, Landslides etc B) Manmade Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures(Building and Bridge), War & Terrorism etc. Slow Disasters (famine, draught, epidemics) and Rapid Onset Disasters(Air Crash, tidal waves, Tsunami) Causes, effects and practical examples for all disasters. Water and Climate Disaster: flood, hail storms, cloudburst, cyclones, heat and snow avalanches, cold waves, droughts, sea erosion, thunder and lightning. Geological Disaster: landslides, earthquakes, Tsunami, mine fires, dam failures and general fires. Biological Disaster: epidemics, pest attacks, cattle epidemic and food poisoning. Nuclear and Industrial Disaster: chemical and industrial disasters , nuclear accidents. Accidental Disaster: urban and forest fires, oil spill, mine flooding incidents, collapse of huge building structures.

Module 2:

Natural disasters- Earthquakes, Tsunami, Floods, Drought, Landslides, Cyclones and Volcanic eruptions. Their case studies. Coastal disasters. Coastal regulation Zone. Risk and Vulnerability Analysis 1. Risk : Its concept and analysis 2. Risk Reduction 3. Vulnerability : Its concept and analysis 4. Strategic Development for Vulnerability Reduction Disaster Prevention and Mitigation. Refugee operations during disasters, Human Resettlement and Rehabilitation issues during and after disasters, Inter-sectoral coordination during disasters,Models in Disasters.

Module 3:

Disaster Preparedness and Response Concept and Nature Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster. Role of Information, Education, Communication, and Training, Disaster Management : Role of Government, International and NGO Bodies. Role of IT in Disaster Preparedness Role of Engineers on Disaster Management. Response Disaster Response : Introduction Disaster Response Plan Communication, Participation, and Activation of Emergency Preparedness Plan Search, Rescue, Evacuation and Logistic Management Role of Government, International and NGO Bodies Psychological Response and Management (Trauma, Stress, Rumor and Panic) Relief and Recovery Medical Health Response to Different Disasters.

Module 4:

Rehabilitation, Reconstruction and Recovery Reconstruction and Rehabilitation as a Means of Development. Damage Assessment Post Disaster effects and Remedial Measures. Creation of Long-term Job Opportunities and Livelihood Options, Disaster Resistant House Construction Sanitation and Hygiene Education and Awareness, Dealing with Victims' Psychology, Longterm Counter Disaster Planning Role of Educational Institute.

Module 5:

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The vulnerability atlas of India. Disaster Prevention and Mitigation. Agencies involved in Disaster Management. Warning and Prediction

NCSBC01-Bridge Course-Basics of C programming

Course Objectives
1. To provide students the confidence and skills to successfully transition to new system
Course Outcomes
CO1: To define the basic concepts in C
CO2:.To develop academic skills and assist the students in C.

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

Unit I

Structure of C: Header and body, Use of comments, Compilation of a program

Unit II

Data Concepts: Variables, Constants, data types like: int, float char, double and void. Declaring and initialize variables

Unit III

Types of operators: Arithmetic, Relational, Logical, Compound Assignment, Increment and decrement, Conditional or ternary, Bitwise and Comma operators.Statements and Expressions.

Unit IV

Data Input and Output functions:printf(), scanf()

Unit V

Iterations: Control statements for decision making:Branching: if statement, else… if statement, switch statement.Looping: while loop, do.. while, for loop.Jump statements: break, continue and goto.

Additional Certification Course:

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Description-An additional Certification Course on Advanced Excel will be provided to 3rd semester students. The duration of the course will be 5hrs.Faculties from Computer Science Department or IT Department will handle the session.

Course Objectives
1. This course is aimed at exposing participants to the use of Advanced Excel formulas and features in intensive data analyse
Course Outcomes
CO1: To explore the magic of analyzing data using Advanced Excel

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

Course Outline are
- Excel Basics
- Work with Cells and Worksheets
- Calculate Your Data
- Format your Workbook
- Add Charts and Graphics
- Collaborate with Others
- Analyze your Data
- Work with Macros and the Web

Basic Skills Enrichment

Program Objective:
To make the students aware of themselves, their environment, about the challenges and to equip them with the basic communication and technical skills, along with practical training sessions.
Course Outcome:

To develop their self-management and communicational skills and also equip them with the basic technical skills.

Module 1: Effective Communication (LSRW)

Session 16: Listening skills: Listening to the words, sentences and passages. Sharing You Tube videos, homework related to the topics and its presentation in class.

Session 17: Speaking skills: vocabulary, speech, pronunciation of the words, sentences and passages. Assigning Situational conversation exercises.

Session 18: Reading skills: Comprehension passages, question and answers

Session 19-20: Writing skills: Grammar, basics, exercises, sentence formations

Module 2: MS office Suite

Session 21-23: Starting MS Word, working with symbols, working with tables, headers, footers and other controls, formatting

Session 24-26: MS Excel, MS PPT - Formatting a worksheet, formatting cells, Using formula & graphs

Session 27-28: Google docs, Google forms, Google spreadsheet, Google Meet

Session 29-30: Introduction to Photoshop/poster making and video editing

Semester 3

1. A11 – Python Programming

Course Objectives
1. To learn basics of Python programming
2.To learn decision making, looping and functions in Python
3.Understand Object Oriented Programming using Python
Course Outcomes
CO1: Identify and recall Python programming basics and paradigm, demonstrating an understanding of fundamental concepts in Python programming.
CO2: Demonstrate an understanding of Python looping and control statements, interpreting how they function within the context of programming tasks.
CO3: Apply knowledge to develop the ability to create and use functions, global variables, recursion, and analytical skills. Demonstrate the practical application of Python programming in coursework and

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professional development.

CO4: Analyze and comprehend the use of Python string, list, tuple, dictionary, and manipulations on them, showcasing the ability to break down and understand complex data structures in Python programming.

CO5: Equip students for developing mini projects using Python standards.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	1	3	3	2	3	3	2
CO2	3	0	0	3	3	3	3	3	2
CO3	3	0	1	3	3	3	3	3	2
CO4	3	0	1	3	3	3	3	3	2
CO5	3	0	3	3	3	3	3	3	2

UNIT I

Introduction to python, features, IDLE, python interpreter, Writing and executing python scripts, comments, identifiers, keywords, variables, data type, operators, operator precedence and associativity, statements, expressions, user inputs, type function, eval function, print function.

UNIT II

Boolean expressions, Simple if statement, if-elif-else statement, compound boolean expressions, nesting, multi way decisions. Loops: The while statement, range functions, the for statement, nested loops, break and continue statements, infinite loops.

UNIT III

Functions, built-in functions, mathematical functions, date time functions, random numbers, writing user defined functions, composition of functions, parameter and arguments, default parameters, function calls, return statement, using global variables, recursion.

UNIT IV

String and string operations, List- creating list, accessing, updating and deleting elements from a list, basic list operations. Tuple- creating and accessing tuples in python, basic tuple operations. Dictionary, built in methods to access, update and delete dictionary values. Set and basic operations on a set.

A12-Sensors and Transducers   **No. of sessions: 64**

Course Objectives
1. To learn basics of transducers
2.To learn construction and working of transducers
3. To understand various types of transducers
Course Outcomes
CO1:Explain resistance, inductance and capacitance transducers.
CO2: Perceive the concepts of temperature and pressure transducers.
CO3: Perceive the concepts level transducers such as and flow transducers
CO4: Explain Electromagnetic transducers and radiation sensors.
CO5:Explain force and torque transducers and sound transducers

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	2	3	0	1	2	0	2	2
CO2	3	0	1	2	0	2	2	1	2
CO3	0	1	2	0	2	3	1	2	3
CO4	2	2	1	2	3	0	1	2	2
CO5	2	0	1	2	3	2	2	2	2

Unit I [16 T]

Transducers: Definition, Principle of sensing & transduction, Classification, Characteristics of transducers. Basic requirement of transducers.

Resistance Transducer: Basic principle – Potentiometer –Loading effects, Resistance strain gauge– Types.

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Inductance Transducer: - Basic principle – Linear variable differential transformer – RVDT-types. Capacitance Transducer: Basic principle- transducers using change in area of plates – distance between plates- variation of dielectric constants –Types

Unit II [16 T]

Thermal sensors: Resistance change type: RTD - materials, construction, types, working principle, Thermistor - materials, construction, types, working principle, Thermo emf sensors: Thermocouple – Principle and types, Radiation sensors: Principle and types.
Pressure Transducers: basic principle- different types of manometers-u tube manometer-well type manometers.

Unit III [16 T]

Level transducer-continuous level measurement-discrete level measurement-mass – capacitive level gauges
Flow Transducers: Bernoulli‟s principle and continuity, Orifice plate, nozzle plate, venture tube, Rotameter, anemometers, electromagnetic flow meter, impeller meter and turbid flow meter

Unit IV [16 T]

Hall effect transducers, Digital transducers, Piezo-electric sensors, eddy current transducers, tacho generators and stroboscope, Magnetostrictive transducers
Radiation sensors: LDR, Photovoltaic cells, photodiodes, photo emissive cell types
Force and Torque Transducers: Proving ring, hydraulic and pneumatic load cell, dynamometer and gyroscopes.
Sound Transducers: Sound level meter, Microphone.

BCA3C05- Computer Oriented Numerical & Statistical Methods   No. of sessions: 80

Course Objectives
1.To learn the floating point arithmetic
2.Learning to solve linear equations.
3.To learn numerical differentiation and integration.
4.To learn the basics of statistics and probability theory
Course Outcomes

CO1:	To learn the application and statistical methods such as correlation and regression.
CO2:	To Learn the techniques to calculate the measures of central tendency and different measures of dispersion
CO3:	To gain insight into consequences of plan by probability techniques and processing samples using sampling techniques
CO4:	To demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems sampling techniques
CO5:	To derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	1	1	1	1	0	1
CO2	2	1	1	0	1	0	1	1	1
CO3	2	0	0	0	1	0	1	1	0
CO4	2	1	1	0	1	0	1	1	1
CO5	2	1	1	0	1	0	1	0	1

UNIT I

Floating Point Arithmetic - Errors, Significant digits and Numerical Instability, Roots of Algebraic Equations - Bisection Method - Method of False Position - Newton Raphson Method.

UNIT II

Interpolation and Approximation–Lagrange & Newton; Interpolations- Finite Difference Operators, Interpolating; Polynomials using finite differences, Simpson''s 1/3rd rule ,Trapezoidal method.

UNIT III

Basics statistics: Measures of central tendencies - Mean, Median, Mode, Geometric mean and Harmonic mean. Measures of dispersion - Range, quartile deviation, Lorenz curve. Mean deviation and standard deviation.

UNIT IV

Curve fitting- Principles of least squares, fitting of straight lines. Correlation (Bivariate case only) Pearson''s coefficient of correlation. Rank correlation and Regression analysis. Probability theory: Random experiment. Sample point, sample space, events, union, intersection and compliment of event

BCA3C06 –Theory of Computation   **No. of sessions: 80**

Course Objectives
1. To get a general introduction to the theory of Computer Science
2. To get a general understanding on different languages, grammar and automata
Course Outcomes
CO1:To understand the basic concepts of mathematical preliminaries
CO2:To use basic concepts of formal languages of finite automata techniques
CO3: To Design Finite Automata for different Regular Expressions and Languages
CO4: Explain the models of computation, including formal languages, grammars and automata, and their connections
CO5: Analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

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CO1	3	1	1	3	3	2	3	3	3
CO2	3	3	3	1	3	2	2	3	3
CO3	3	1	2	3	3	3	3	3	2
CO4	2	2	2	3	2	3	3	3	3
CO5	3	1	3	3	3	3	3	3	3

UNIT I (10T)

Introduction to Mathematical preliminaries: Sets, Functions and Relations, graphs and trees, Strings and their Properties, Proof techniques: By induction, by contradiction.

UNIT II (10T)

Formal languages: Definitions and examples, Chomsky classification of languages, Languages and their relation, Recursive and Recursively enumerable sets, Languages and automata.

UNIT III (20T)

Theory of Automata: Definition of automaton, description of a finite automaton, DFA, transition systems, properties of transition functions, acceptability of a string by a finite automaton, Non deterministic finite state machines: with epsilon moves and without epsilon moves, equivalence of DFA and NDFA, Mealy and Moore Models, minimization of finite automata. Regular sets and grammar: Regular expressions, Finite automata and regular expressions, closure properties of regular sets, Algebraic laws for regular expressions, regular sets and regular grammars

UNIT IV (20T)

Context free languages: Context free languages and derivation trees, Ambiguity in context free grammars, Simplification of context free languages, normal forms for context free languages.

UNIT V (20T)

Pushdown automata: Definition, Acceptance by PDA, Pushdown automata and Context-free languages, Parsing and Pushdown Automata. Turing Machines: Turing machine model, representation of Turing machines, languages accepted by Turing machine.

BCA3B04 – Data Structures Using C

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Course Objectives
1. To introduce the concept of data structures
2. To make the students aware of various data structures
3. To equip the students implement fundamental data structures
Course Outcomes
CO1 - Develop ability to analyze algorithms and algorithm correctness and impart the basic concepts of data structures and algorithms
CO2 -Enable students to describe how arrays,, linked structures are represented in memory and used by algorithms as well as describe common applications for arrays, linked structures
CO3 - Demonstrate stacks, queues are represented in memory and used by algorithms and describe common applications for stacks, queues
CO4 - Demonstrate different methods for traversing trees and how represented in memory
CO5-Enable students to Design and implement an appropriate hashing function, searching and sorting techniques

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	3	3	2	3	2	1
CO2	3	1	0	3	3	3	3	2	3
CO3	3	1	0	3	3	3	3	2	3
CO4	3	1	0	3	3	2	3	2	3
CO5	3	1	0	3	3	3	3	2	3

UNIT I [9 T + 7L]

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure,

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Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space trade off, Big-O notation.

Strings: Introduction, strings, String operations, Pattern matching algorithms

UNIT II [10 T + 14 L]

Arrays: Introduction, Linear arrays, Representation of linear array in memory, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, sparse matrix.

Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Applications of linked lists, Algorithm of insertion/deletion in Singly Linked List (SLL).

UNIT III [10 T + 14 L]

Stack: primitive operation on stack, algorithms for push and pop. Representation of Stack as Linked List and array, Stacks applications: polish notation, recursion.

Introduction to queues: Primitive Operations on the Queues, Circular queue, Priority queue, Representation of Queues as Linked List and array, Applications of queue: Algorithm on insertion and deletion in simple queue and circular queue.

UNIT IV [10 T + 14 L]

Trees - Basic Terminology, representation, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree: insertion, deletion and processing, Traversal of binary trees: In order, Pre-order & post-order, Algorithm of tree traversal with and without recursion, Binary Search Tree, Operation on Binary Search Tree, expression trees, implementation using pointers, applications.

UNIT V [10 T + 14 L]

Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, graph traversal- depth-first and breadth-first traversal of graphs, applications.

Searching: sequential searching, binary searching, Hashing – linear hashing, hash functions, hash table searching; Sorting: Quick Sort, Exchange sort, Selection sort and Insertion sort.

NCSACT06-Mini Project-Python

Description:It provides a fundamental understanding of the Python programming language and enables one to have the skills and understanding of Python to confidently apply for Python programming jobs.It also acquire the prerequisite Python skills to move into specific branches - Machine Learning, Data Science, etc..

Course Objectives
1. To understand the real time software development environment. The student can gain a thorough knowledge in developing a application using python
Course Outcomes
CO1: To acquire programming skills in core Python and Object Oriented Skills in Python
CO2:.To develop the skill of designing Graphical user Interfaces in Python

CO-PO/PSO Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

AUD3E03- HUMAN RIGHTS

Course Objectives
In-depth insight into the constitutional, statutory and institutional aspects of human rights and special legislations dealing with protection of vulnerable and marginalized groups.
Course Outcomes
C01. Understand the importance and different approaches to Human rights
C02. Understand the different mechanisms of United Nations to ensure and protect the Human Rights
C03. Understand the different Constitutional provisions and legislations to protect Human Rights in India
C04. Analyse the functions of NHRC, Judiciary and PIL for protecting Human Rights in India
C05. Examine the challenges to Human Rights of different vulnerable sections

MODULE –I

HUMAN RIGHTS; Meaning, Evolution and Importance Approaches; Western, Marxian, Feminist and Third World

MODULE – II

U N O AND HUMAN RIGHTS (a)Universal Declaration of Human Rights (b)International Covenants on Civil and Political Rights(ICCPR), International Covenant on Social Economic and Cultural Rights(ICSECR) (c) The Office of the United Nations High Commissioners for Human Rights(UNHCHR)

MODULE- III

HUMAN RIGHTS IN INDIA (a)Constitutional Provisions- Fundamental Rights, Directive Principles of

State Policy (b)Some important Legislations 1) Protection of Civil Rights Act-1955 2) Prevention of Atrocities (SC and ST) Act 1989 3) Sexual Harassment of Women at workplace (Prevention, Prohibition and Redressal) Act, 2013 4) The Rights of Persons with Disabilities Act-2016 5) Right to information Act 2005

(c) Agencies Protecting Human Rights ; Judiciary, Public Interest Litigation, National Human Rights Commission and Media

MODULE- IV
CHALLENGES TO HUMAN RIGHTS Human Rights Violations against Women, Children, Other marginalized sections like Minorities, Dalits, Adivasis and Women, Refugees

NCSACC1-Add on Course -Python Programming
Description:An add on course on Python Programming will be provided to students.All the students should register for the course via Coursera. The duration of the course will be 30 hours.The course aims to increase the basic knowledge of Python and to improve the problem solving skills of students through the implementation programs using Python.

Course Objectives
This course aims to teach everyone the basics of programming computers using Python.. The course has no pre-requisites and avoids all but the simplest mathematics. Anyone with moderate computer experience should be able to master the materials in this course.The course is designed to provide Basic knowledge of Python and to develop the skill of designing Graphical user Interfaces in Python
Course Outcomes
CO1: To cover the basics of how one constructs a program from a series of simple instructions in Python.
CO2: To prepare students to take more advanced programming courses.
CO3: To develop the ability to write applications in Python

CO-PO/PSO Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	3	3	3	2
CO3	2	2	3	0	3	3	3	3	3

UNIT I

Introduction to python, features, IDLE, python interpreter, Writing and executing python scripts, comments, identifiers, keywords, variables, data type, operators, operator precedence and associativity, statements, expressions, user inputs, type function, eval function, print function.

UNIT II

Boolean expressions, Simple if statement, if-elif-else statement, compound boolean expressions, nesting, multi way decisions. Loops: The while statement, range functions, the for statement, nested loops, break and continue statements, infinite loops.

UNIT III

Functions, built-in functions, mathematical functions, date time functions, random numbers, writing user defined functions, composition of functions, parameter and arguments, default parameters, function calls, return statement, using global variables, recursion.

UNIT IV

String and string operations, List- creating list, accessing, updating and deleting elements from a list, basic list operations. Tuple- creating and accessing tuples in python, basic tuple operations. Dictionary, built in methods to access, update and delete dictionary values. Set and basic operations on a set, practicing lab programs

NCSACT05-Workshop-Introduction to system hardware
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Description: The objective of this workshop is to acquaint the students with the basic principles, developments and research trends in the area of Computer Hardware. The workshop covers the perfect combination of theory and practical sessions in the well balanced manner. This workshop will certainly help students to improve technical skill set and hence employability, and the faculty members to improve teaching methodology and efficiency.

Course Objectives
1. To impart the skills needed to assemble a PC, PC troubleshooting, installation of system/application software. Student will be able to prepare cables for LAN, assemble a PC
Course Outcomes
CO1: To acquire knowledge about Computer Hardware components
CO2:.To develop the skill of assembling a PC

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

Intermediate Skills Enrichment

Program Objective: To make the students aware of their career choices and competencies required to be successful in their domain and equip them with the required skills.
Course Outcome:
 To equip the students with the skills required to excel in their respective domains.
Includes domain specific activities

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MODULE 1: Session 1- 3 (Quantitative Aptitude)   3 Hrs

➢ Divisibility, LCM, HCF ➢ Numbers, Decimals, Fractions ➢ Powers, Algebra, Percentages

MODULE 2: Session 4-5 (Quantitative Aptitude)   2 Hrs

➢ Profit, Loss ➢ Simple interest, Compound interest

MODULE 3: Session 6-8 (Quantitative Aptitude)   3 Hrs

➢ Speed, Distance, Time ➢ Work & wages ➢ Ratio, proportion and partnerships

MODULE 4: Session 9-11(Quantitative Aptitude)   3 Hrs

➢ Searing arrangements, Calendar dates ➢ Probability ➢ Permutations and combinations

MODULE 5: Session 12-14 (Quantitative Aptitude)   3 Hrs

➢ Train, Boat, Streams- Upstream/Downstream ➢ Cisterns and pipes ➢ Mensuration

Assessment Test -1 Hour at the end of semester

Semester 4

1. A13 – Data Communication and Optical Fibers

No. of sessions: 64

Course Objectives
1. To learn basics of data communication, Networking architectures and applications.
2. Expose the students to the basic of signal propagation through optical fibers, fiber impairments, components and devices and system design
Course Outcomes
CO1: Identify and understand processes to communicate with each other across a computer network.
CO2:Able to understand the concept of network topology
CO3: Understand the concept of multiplexing, GSM and its applications.
CO4: Analyze the services, roles and features of the data link control of data networks
CO5: Identify and understand the fundamental knowledge about optical fiber communication systems.

CO-PO/PSO Mapping

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	3	3	3	3	3	3

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CO2	3	2	2	3	3	3	3	3	3
CO3	3	2	2	3	2	2	3	3	3
CO4	3	2	2	3	2	3	3	3	3
CO5	3	2	2	3	3	3	3	3	3

Unit I

Introduction- Components, Networks, Protocols and standards, Basic Concepts: Line Configuration, Topology Transmission mode, analog and digital signals, Encoding and modulating analog- to-digital conversion, digital to analog conversion, digital data transmission, DTE-DCE interface, modems, cable modems. Transmission media: guided media, unguided media, and transmission impairment.

Unit II

Multiplexing: Many to one/ one to many, frequency division multiplexing, wave division multiplexing, TDM, multiplexing applications: the telephone system, Cellular System, Mobile Communication-GSM, Mobile Services, GSM system Architecture, Radio Interface in GSM

Unit III

Data link Control: Line Discipline, flow control, error control, Data link Protocols: Asynchronous Protocols, synchronous protocols, character oriented protocols, bit – oriented protocols, link access procedures. Local Area Networks: Ethernet, token bus, token ring, FDDI, Comparison, Switching Circuit switching, packet switching, message switching, integrated services digital networks (ISDN): services, history, subscriber access to ISDN.

Unit IV

Overview of Optical Fiber Communication - Introduction, historical development, general system, advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, fiber materials, Optical Sources And Detectors- Introduction, LED‟s, LASER diodes, Photo detectors. Ray theory, cylindrical fiber, single mode fiber, cutoff wavelength, mode field

A14 Microprocessors-Architecture and Programming
Number of Contact Hours: 64 Hrs.

Course Objectives
1. To understand internals of Microprocessor
2. To learn architecture of 8085 Microprocessor
3.To learn instruction set of 8085 Microprocessor

Course Outcomes
CO1: Enable students to understand internals of Microprocessor
CO2: Enable students to understand architecture of 8085 Microprocessor
CO3: Enable students to understand instruction set of 8085 Microprocessor
CO4:Enable students to program a Microprocessor
CO5: Enable students to understand basics of 8086 microprocessor

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	0	0	3	3	3	3	3
CO2	3	3	1	1	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3
CO4	3	3	1	3	3	3	3	3	3
CO5	3	3	0	3	3	3	3	3	3

Module I

General architecture of computer, Introduction to Microprocessor, Memory classification, Introduction to 8085,Microprocessor bus organizations ,data bus, address bus, control bus. Memory addressing, memory mapping. 8085 architecture in detail. General purpose registers and special purpose registers, flag register -8085 pins and signals.

Module II

Assembly language programming basics. Opcode, Mnemonics etc. 8085 instruction set ,Data transfer ,Arithmetic and Logic, Shifting and rotating, Branching/Jump, Program control. Addressing modes. Memory read and write cycle. Timing diagram. Instruction cycle , machine cycle and T-states. Types of I/O addressing .Simple programs.

Module III

Types of programming techniques looping, indexing (pointers),delay generation. Stack in 8085, call and return Instructions. Data transfer between stack and microprocessor. Subroutine and delay programs. Interrupts in 8085. Interrupt driven programs. Interfacing - Programmable peripheral devices - 8255A, 8254, 8237.

Module IV

Introduction to 8086/88 microprocessors – overview, 8086 internal architecture. The execution unit, BIU, Registers, Flags, Segmentation, physical address calculation, addressing modes.

BCA4B05 – Database Management System and RDBMS   **No. of sessions: 112**

Course Objectives
1. To learn the basic principles of database and database design
2.To learn the basics of RDBMS
3.To learn the concepts of database manipulation SQL
4.To study PL/SQL language
Course Outcomes
CO1:To learn the basic concepts of databases and data models and explains the features of database management systems, architecture of database systems, and the role of database users.
CO2: Develops an Entity-Relationship model based on user requirements and Convert an Entity-Relationship diagram to Relational Schema.
CO3: Learn Functional Dependency and Functional Decomposition and Applies various Normalization techniques for database design improvement.
CO4:   Use the basics of SQL and construct queries using SQL in database creation and interaction.
CO5: To understand the principle of transaction management design and Design a commercial relational database system (Postgres) by writing SQL using the system.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	1	3	3	3	3	2

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CO2	2	2	1	2	3	2	3	3	3
CO3	3	2	2	3	3	3	3	3	3
CO4	3	2	1	3	3	3	3	3	3
CO5	3	2	1	3	3	3	3	3	3

Unit I [8 T+ 2L]

Database System concepts and applications Introduction to databases, File Systems vs. DBMS, Advantages and Disadvantages of using DBMS Approach, Database administrators and user, Data Models, Schemas, and Instances, Types of Data Models, Three Schema Architecture and Data Independence, Database Languages and Interfaces.

Unit II [10 T+ 6L]

Entity-Relationship Model - Conceptual Data Models for Database Design Entity Relationship Models, Concept of Entity, Entity Sets, Relationship Sets, Attributes, Domains, Constraints, Keys, Strong and Weak Entities, Concepts of EER. Relational Data Model Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus, Relational Database Design using ER to Relational Mapping.

Unit III [10 T+12L]

Relational Database Design - Relational database design Anomalies in a Database, Normalization Theory, Functional Dependencies, First, Second and Third Normal Forms, Relations with more than one Candidate Key, Good and Bad Decompositions, Boyce Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit IV [10 T +20L]

SQL Concepts: Basics of SQL, DDL, DML, DCL, Tables – Create, Modify and Delete table structures, Rename and Drop tables, Defining constraints – Primary key, foreign key, unique, not null, check, IN operator Select Command, Logical Operators, Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All. View - Creation, Renaming the column of a view, destroys view.

Unit V [10 T+24L]

Transaction Management and Concurrency Control - Transaction Properties (ACID), states, Commit, Rollback; Concurrency Control Lost update problems, Locks, two phase locking. Programming with SQL: Data types: Base and Composite, Attributes. Variables – Constants - Using set and select commands, Control Structures: IF, IF THEN ELSE, IF THEN ELSEIF, CASE. Loops: LOOP, EXIT, CONTINUE, WHILE, FOR, and FOREACH -

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Looping Through Arrays - Looping Through Query Results. Security: Locks: Table-level Lock, Row-level Lock, Deadlock, Advisory Lock. Cursors: Boud and Unbound Cursors, Declaration, Opening, Working with cursors: FETCH, MOVE, UPDATE/DELETE, CLOSE, Looping through a Cursor. Concept of Stored Procedures – Advantages and Disadvantages – Creation – Parameters Setting for Function- Alter – Drop – Grant and Revoke - Passing and Returning data to/from Stored Procedures - Using stored procedures within queries – Triggers: Creation, Modification, Deletion, Error Handling: Control Structures, Cursors, Functions, Triggers.

BCA4C08 – Computer Graphics   **No. of sessions: 80**

Course Objectives
1. To learn the basics of computer graphics
2.To learn the applications of Computer graphics in various contexts
3.To equip the students to execute graphics algorithms and and solve simple problems
4.To learn the basics of GIMP
Course Outcomes
CO1:Students will be able to learn the basics and applications of computer graphics
CO2: Students will be able to understand line drawing and filling algorithms
CO3: Students will be able to understand various 2D transformations
CO4: Students will be able to understand line and polygon clipping algorithms
CO5: Students will be able to learn the basics of color models and GIMP

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	0	1	2	2	1	1	1	1
CO2	3	2	2	1	1	1	2	2	1
CO3	3	2	0	2	2	2	2	2	1
CO4	3	2	2	1	1	1	2	2	1

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CO5	3	2	2	3	3	3	3	3	3

Unit 1

Introduction to computer graphics definition, Application, Pixel, Frame Buffer, Raster and Random Scan Display, Display Devices CRT, Color CRT Monitors, basics of LCD and LED Monitors

Unit 2

Scan Conversion of Line, DDA Algorithm of Line Drawing, Scan Conversion of Circles- Bradenham's Circle Generating algorithm, Polygon Filling, Scan Line Polygon Filling
Algorithm

Unit 3

Two-Dimensional Transformation, Translation, Rotation, Scaling, Homogeneous Coordinates, Reflection, Shear

Unit 4

Window to Viewport Transformation, Clipping, Line Clipping, Cohen Sutherland Line Clipping, Polygon Clipping, Sutherland and Gray Hodgman Polygon Clipping Algorithm.

Unit 5

Color Models and Color Applications Light and Color, Different color models, RGB, CMY,,YIQ. Introduction to GIMP, Image Manipulation Using GIMP.

BCA4C07- E-Commerce

No : of sessions :80

Course Objectives
1. To get a general introduction of the Electronic Commerce framework.
2.To get a general understanding on the various electronic payment system
3.To get a general understanding on the Internal information systems.
4.To get a general understanding on the new age information.
Course Outcomes
CO1:Understand the concept of E-commerce and its transition in India
CO2: Identify the different models for E-commerce
CO3: Understand the networking technologies that facilitate E-commerce

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CO4: Identify the key security threats in the E-commerce environment.
C05: Able to do online transactions through different payment methods

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	1	3	2	2	2	2
CO2	2	1	0	2	3	3	2	2	2
CO3	3	2	1	2	3	3	2	3	3
CO4	3	0	2	2	3	2	2	2	3
CO5	3	2	3	3	3	3	2	2	3

UNIT I (15T)

History of E-commerce and Indian Business Context : E-Commerce, Emergence of the Internet, Emergence of the WWW, Advantages of E-Commerce, Transition to E-Commerce in India, The Internet and India, E-transition Challenges for Indian Corporates.

UNIT II (15T)

Business Models for E-commerce: Business Model, E-business Models Based on them Relationship of Transaction Parties - E-business Models Based on the Relationship of, Transaction Types.

UNIT III (18T)

Enabling Technologies of the World Wide Web: World Wide Web, Internet Client-Server Applications, Networks and Internets, Software Agents, Internet Standards and Specifications, ISP.e-Marketing: Traditional Marketing, Identifying Web Presence Goals, Online Marketing, Advertising-branding.

UNIT IV (17T)

e-Security : Information system Security, Security on the Internet, E-business Risk Management Issues, Information Security Environment in India. Legal and Ethical Issues: Cyber stalking, Privacy is at Risk in the Internet Age, Phishing, Application Fraud, Skimming, Copyright, Internet Gambling, Threats to Children.

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UNIT V (15T)

e-P ayment Systems: Main Concerns in Internet Banking, Digital Payment Requirements, Digital Token-based e-payment Systems, Classification of New Payment Systems, Properties of Electronic Cash, Cheque Payment Systems on the Internet, Risk and e-Payment Systems, Designing e-payment Systems, Digital Signature.

AUD4E06-Gender Studies

Course Objectives
1.   To provide the relevance and significance of the ideas of gender equality and gender justice in our society
2.   To develop an understanding about the basic concepts of gender studies
3.   To provide a historical background of women's movements and its relevance
4.   To understand the major debates around gendered ways of violence and to introduce gender perspectives on popular culture

Course Outcomes
C01. It helps the student to acquire knowledge about the importance of gender equality and women's rights
C02. It helps the student to develop gender sensitivity through an analysis of contemporary social issues at the global, national and local levels
C03. It helps the student to familiarize with analyzing the popular culture and media with a gender perspective
C04. It equips the student to acquire knowledge about the various organs, conventions, constitutional provisions and redressal systems to combat gender discrimination

Module I

Introducing the concepts of sex and gender, gender division of labour, patriarchy, sexualities and sexual orientations, gender stereotypes, masculinities, intersectionalities of race, class, caste and gender in family and society

Module II

Women's Experiences in family & work, community, public sphere kinship structures,various forms of violence against women – female foeticide, infanticide, dowry, domestic violence, sexual assaults, rape, sexual harassment at workplace, honour killings –Government mechanisms to combat Violence against women in India

Module III

Historical Roots of Women's Movements in India and global – Right to vote –Women'sQuestion and social reform in 19th early 20th Century in India and Kerala –Women in National Movement – Left Movement- The Contemporary Women's Movements in India – Queer movements – International human rights instruments & UN conventions on gender rights, Indian Constitutional guarantees of equality and citizenship rights – gender in higher Education

Module IV

Gender perspectives on popular culture, discourse and practices of cinema, television,popular music, magazines and advertisements, representations of women and gender/sexual minorities in media, gendered dimensions of social media – analysis of gender in news – print, television, web and women's media initiatives

NCSBC01-Bridge Course-Introduction to Object Oriented Programming

Course Objectives
1. To provide students the confidence and skills to successfully transition to new system
Course Outcomes
CO1: To define the basic concepts in object oriented programming.
CO2:.To develop academic skills and assist the students in object oriented programming.

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

Unit I
Introduction to Object Oriented Programming: Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming.
Unit II
Basic principles of Object Orientation-class, object,abstraction, encapsulation, inheritance, polymorphism, modularity, and message passing.
Unit III
Features of object orientation - attributes, state, identity, operation, behaviour.Access specifiers-private,public,protected
Unit IV
Classes and Objects:Introduction,class fundamentals,Defining a class,Creating objects,Accessing class members.
Unit V
Inheritance and polymorphism - Introduction - Defining derived classes - Types of

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inheritances,Compile time and Runtime polymorphism(concepts only)

NCAWWS02-Walk with the Scholar-Research Writing

Course Objectives
1. To help the students to to learn basics of research.
Course Outcomes
CO1: To develop certain generic skills, non-technical competencies, attitudes and behaviours
CO2:To provide necessary orientation,guidance ,motivation and support to enrich and nourish their talents.

Overview of Research,Overview of Literature Survey: Literature Survey using Web of Science, Literature Survey using Scopus,Data Analysis,How to make Technical presentation – Technical Writing,Intellectual property,Research in Computer Science & Engineering

NCSACT06- Industrial Interaction-Industry Ethics & Practices

Description:The main purpose is to give students an insight into the regular, internal workings of a company.It gives good understanding of the industry and helps in building up useful case studies for improving the quality of future teaching. It provides an ability to identify research programmes of industrial importance.

Course Objectives
To make students aware about the ethics and practices in the industry
Course Outcomes
CO1: To learn as to how theatrical concepts are put into action, thereby aiding their practical learning.
CO2:.To enhance interpersonal skills and communication techniques and to become more aware of industry practices and regulations

PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

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CO									
CO1	3	2	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	3	3

NCSACT07-Mini Project-Computer Graphics

Description:The main aim is to illustrate the concepts and usage of pre-built functions in OpenGL. Creating Figures and the surrounding environment using inbuilt functions provided by the glut library.

Course Objectives
1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
2.Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
Course Outcomes
CO1: To acquire programming skills in developing graphics based applications
CO2:.To develop the skill of animation

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

NCSACC4-Additional Certification Course

Description:An additional Certification Course on "Research Paper Writing and Publication" will be provided to students.The duration of the course will be 5 hours.Faculties of Computer Science Department will handle the session.The session will provide more insight towards research paper writing skills and publication of papers by the students.

Course Objectives

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1.The major purpose of this course is to provide you with technical knowledge and skills necessary to write and to publish professional papers.
2.Understand research terminology
3.Be aware of the ethical principles of research
Course Outcomes
CO1: To learn and synthesize new concepts in writing a research paper

PO CO	PO1	PO2	PO3	PO2	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	3	2

Topics:

- Overview of Research
- Overview of Literature Survey: Literature Survey using Web of Science, Literature Survey using Scopus, Writing Up, Tutorial on using BibTeX with LaTeX to add references to a document, Tutorial on using Microsoft Word with Bibliographic Sources, Tutorial on using Microsoft Word with endnote entries
- Data Analysis
- How to make Technical presentation – Technical Writing
- Intellectual property
- Research in Computer Science & Engineering

Intermediate Skills Enrichment

Program Objective: To make the students aware of their career choices and competencies required to be successful in their domain and equip them with the required skills.

Course Outcome:

 To equip the students with the skills required to excel in their respective domains.

MODULE 1: Session 1-3 (Logical Reasoning)   3 Hrs

➢ Coding – decoding ➢ Series missing number ➢ Statements & Assumptions ➢ Statements & Arguments

MODULE 2: Session 4-6 (Logical Reasoning)   3 Hrs

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➢ Blood relations ➢ Matrix arrangement ➢ Analogy Test

MODULE 3: Session 7-8 (Logical Reasoning)   2Hrs

➢ Direction & ranking ➢ Cause and effect ➢ Syllogism

MODULE 4: Session 9-11(Verbal Reasoning)   3 Hrs

➢ Reading comprehension ➢ Vocabulary – synonyms & antonyms

MODULE 5: Session 12-14 (Verbal Reasoning)   3 Hrs

➢ Jumbled words ➢ Idioms & phrases

Assessment Test -1 Hour at the end of semester

Semester 5

BCA5B07 – Computer Organization and Architecture   **No. of sessions: 64**

Course Objectives
1. To learn logic gates, combinational circuits and sequential circuits
2.To learn basics of computer organization and architecture
3.To equip the students to understand the method of program execution in computers
4.To learn the basics of memory organization
Course Outcomes
CO1:Students will be able to learn the basics of digital circuits,logic gates and combinational circuits
CO2: Students will be able to learn the basics of flip flops and its applications
CO3: Students will be able to understand the basics of computer organization
CO4: Students will be able to understand the basics of microprogramming and addressing modes
CO5: Students will be able to understand the basics of memory organization

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	3	3	3	3	3
CO2	3	3	1	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3

Unit 1

Digital Logic - Positive and negative logic, logic gates ,NOT gate, OR gate, AND gate, XOR and X-NOR gates, Universal gates- NAND gate, NOR gate,. Combinational circuits- Half adder, half subtractor, full adder, full subtractor, ripple carry adders, look-ahead carry adders, decoders, BCD to 7-segment decoder, encoders, multiplexers and demultiplexers.

Unit 2

Sequential Logic Circuits: Edge triggering, Pulse triggering ,SR latch, SR flip flop, JK flip flop, Master Slave JK flip flop, D flip flop, T flip flop. Shift register: serial in - serial out, serial in - parallel out, parallel in - serial out, parallel in-parallel out configurations. counters (asynchronous & synchronous), up/down counter, decade counter, mod N counter, Ring counter, Johnson"s counter

Unit 3

Basic Computer Organization and Design: Instruction Codes , Computer Registers, Computer Instructions, Instruction types, Timing and Control, Instruction Cycle, Memory reference Instructions, Register reference instructions, Input, Output and Interrupt Design of Basic Computer, Design of Accumulator logic

Unit 4

Micro programmed Control: Control Memory, Address sequencing, Micro program Example, Design of control unit. Processor Organization: general register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control

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Unit 5

Memory Organization: Memory mapping, Associative memory, Cache memory, Virtual Memory, Memory Management Hardware, hit/miss ratio, Input-Output Organization: Peripheral devices, I/O interface, Modes of Transfer-asynchronous and synchronous, Priority Interrupt, Strobe Control, Handshaking. Direct Memory Access, Input-Output Processor, Serial Communication. I/O Controllers

BCA5B08 -Java Programming   **No. of sessions: 96**

Course Objectives
1.To understand the concepts and features of object oriented programming
2.To examine key aspects of java Standard API library such as util, io
3.To provide basics of multithreading, exception handling and database connectivity etc
4 To impart the techniques of creating GUI based applications.
Course Outcomes
CO1:Apply object oriented programming features and concepts for solving given problems.
CO2: Able to use java standard API library to write complex programs .
CO3:Implement object oriented programming concepts
CO4:Implement Exception Handling and database connections in java.
CO5: Use graphical user interface and Event Handling in java

CO-PO/PSO Mapping

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	3	1	3	3	3	3
CO2	3	1	1	3	2	3	2	3	1
CO3	2	2	1	2	1	2	3	2	2
CO4	2	3	1	2	3	3	2	2	2
CO5	3	2	1	3	1	3	3	3	3

Unit I

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Introduction to OOPS, Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming, basic principles of Object Orientation-class, object, abstraction, encapsulation, inheritance, polymorphism, modularity, and message passing. Features of object orientation - attributes, state, identity, operation, behaviour.

Unit II

Introduction to Java: History, Versioning, The Java Virtual Machine, Byte code, Writing simple java program, Language Components: Primitive Data Types, Comments, Keywords, literals, The break Statement, The continue Statement, Operators – Casts and Conversions, Arrays. Introduction to classes and methods, constructors, Passing Objects to Methods, Method Overloading, Static and final, The this Reference, finalize, inner and nested classes. Inheriting class, extends, member access and inheritance, super keyword, Object class. Dynamic method dispatch, method overriding, abstract class, interface, packages, import statement.

Unit III

Exceptions, I/O and Threads Input and Output in Java: The File Class, Standard Streams, Keyboard Input, File I/O Using Byte Streams, Character Streams, File I/O Using Character Streams - Buffered Streams, File I/O Using a Buffered Stream, Keyboard Input Using a Buffered Stream,Writing Text Files. Threads: Threads vs. Processes, Creating Threads by Extending Thread, Creating Threads by Implementing Runnable, Advantages of Using Threads, Daemon Threads, Thread States, Thread Problems, Synchronization. Exceptions: Exception Handling, The Exception Hierarchy, throws statement, throw statement, Developing user defined Exception Classes- The finally Block.

Unit IV

Database Connectivity & Applets: Introduction to JDBC : The JDBC Connectivity Model, Database Programming, Connecting to the Database, Creating a SQL Query, Executing SQL Queries, Getting the Results, Updating Database Data, Executing SQL Update/Delete, The Statement Interface, The ResultSet Interface, ResultSetMetaData. Introduction to GUI Applications - Applets - Types of Applet, Applet Skeleton, Update method, repaint Methods, Html Applet tag and passing parameter to applet.

Unit V

Events and GUI Applications: Event Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter Classes. Java Desktop Applications, Introduction to the AWT, Overview of the AWT, Structure of the AWT, The AWT hierarchy, Containers, Components, Canvas, Frame Working with: Color, Font, FontMetrics, Simple Graphics- Point, line, Rectangle, Polygon, Controls - Button, , Checkbox, Choice, , Label, List, Scroll bar, TextArea, TextField, Layout Manager, MenuBar, Menu, MenuItem , Checkbox MenuItem.

Text Books

1. Herbert Scheldt, Java The Complete Reference, 8th Edition, Tata McGraw-Hill Edition, ISBN: 9781259002465

References

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1. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata McGraw Hill Education Private Limited, ISBN: 007014169X.
2. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024. 3. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise in a Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 0596101422.

BCA5B09 -Web Programming using PHP   **No. of sessions: 96**

Course Objectives
1. To learn html concept
2.To learn the basics server side programming using Javascript
3.To study PHP language concepts
4.To study database connectivity using PHP and Postgres
Course Outcomes
CO1:To learn the basic concepts of creating web pages using HTML
CO2: write server side scripting programs using java script
CO3: Learn basics of PHP programming language
CO4:   Create PHP programs that use various PHP library functions, and that manipulate files and directories.
CO5: Analyze and solve various database tasks using the PHP language.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	1	0	2	2	3	3	2	3
CO2	2	1	1	3	2	2	2	3	2
CO3	1	2	1	3	1	3	3	3	3
CO4	2	1	1	2	2	2	2	3	3
CO5	3	2	1	2	1	2	3	3	3

NCSACT11-Industrial Interaction-Getting ready for placements

Description:The main purpose is to give students an insight into the regular, internal workings of a company.It gives good understanding of the industry and helps in building up useful case studies for improving the quality of future teaching. It provides an ability to identify research programmes of industrial importance.
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	Course Objectives
	To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
	Course Outcomes
	CO1: To learn as to how theatrical concepts are put into action, thereby aiding their practical learning.
	CO2:.To enhance interpersonal skills and communication techniques and to become more aware of industry practices and regulations

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	3	3

Unit I [9 T + 9L]

Introduction web-documents: Static, Dynamic, Active - Web programming: client side and server side scripting. HTML 5: Document Structure, Elements, Attributes, Types of Elements and Attributes, Basic HTML Data types. Using HTML5 form elements: datalist, keygen, output, progress, meter. File uploading using forms - Frameset and frames. CSS: External CSS, CSS3 Syntax, Selector: Universal, Class, ID. Working with Lists and Tables, CSS ID and Class – Navigation Bar - Image Gallery – Image Opacity.

Unit II [9 T + 9L]

Javascript: Introduction, Client side programming, script tag, comments, variables. Including JavaScript in HTML: head, body, external. Data types. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. Output functions: write, writeln, popup boxes: prompt, alert, confirm. Functions: Built-in Global Functions: alert(), prompt(), confirm(), isNan(), Number(), parseInt(). User Defined Functions, Calling Functions with Timer, Events Familiarization: onLoad, onClick, onBlur, onSubmit, onChange, Document Object Model (Concept). Objects: String, Array, Date.

Unit III [10 T + 10 L]

PHP: Introduction, Server side programming, Role of Web Server software, Including PHP Script in HTML: head, body, external. Comments, Data types, variables and scope, echo and print. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. User Defined Functions.

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Unit IV [10 T + 10 L]

Working with PHP: Passing information between pages, HTTP GET and POST method, Cookie,Session. String functions: strlen, strops, strstr, strcmp, substr, str_replace, string case, Array constructs: array(),list() and foreach(). Header().

Unit V [10 T + 10 L]

PHP & PostgreSQL: Features of PostgreSQL, data types, PostgreSQL commands – CREATE DATABASE, CREATE TABLE, DESCRIBE TABLE (\d table_name or using usinginformation_schema), SELECT, SELECT INTO, CREATE AS, DELETE, UPDATE, INSERT. PHP - PostgreSQL Integration: Establishing Database Connection (pg_connect(), pg_connection_status(), pg_dbname()), Getting Error String (pg_last_error()), Closing database Connection (pg_close()), Executing SQL statements (pg_query(), pg_execute()), Retrieving Data (pg_fetch_row(), pg_fetch_array(), pg_fetch_all(), pg_fetch_assoc(), pg_fetch_object(), pg_num_rows(), pg_num_fields() pg_affected_rows(), pg_num_rows(), pg_free_result()), Insertion and Deletion of data using PHP, Displaying data from PostrgreSQL database in webpage. Introduction to AJAX - Implementation of AJAX in PHP - Simple example for partial page update.

BCA5B10 -Principles of Software Engineering

Course Outcomes

· CO1 To learn engineering practices in Software Development.
· CO2 Select and implement different software development process models.
· CO3 Extract and analyse software requirements specifications for different projects.
· CO4 Develops some basic level of software architecture/design.
· CO5 Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	3	3	3	3	3	3

CO2	3	2	2	3	3	3	3	3	3
CO3	3	2	2	3	3	3	3	3	3
CO4	3	2	3	3	3	3	3	3	3
CO5	3	2	3	3	3	3	3	3	3

Course Outline
UNIT I [13T]
Software and Software Engineering: Overview of Software Engineering, Practice & Myths; Software Process; Generic process model- Framework Activity, Task Set, Process Patterns, Process Improvement; SDLC , Prescriptive process model- Waterfall Model, Spiral Model, Incremental Process Model, Evolutionary Process Model; Specialized Process Models: Component Based Development, the Formal Methods Models;
Agile development-Agile Process; Extreme Programming; Other Agile Process Models – ASD, Scrum, DSDM, FDD, LSD, Agile Modeling, Agile Unified Process..
UNIT II [13T]
Requirements Engineering- Establishing the Groundwork- Eliciting Requirements - Developing use cases – Building the requirements model - Negotiating, validating Requirements - Requirements Analysis-Requirements Modeling Strategies.
UNIT III [14T]
MODELING WITH UML: Concepts and Diagrams - Use Case Diagrams - Class Diagrams - Interaction Diagrams - State chart Diagrams – Activity Diagrams - Package Diagrams - Component Diagrams - Deployment Diagrams - Diagram Organization- Diagram Extensions. Design Process- Design concepts: Abstraction, Architecture, patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component, Deployment Level Design Elements.
UNIT IV [11T]
Structured coding Techniques-Coding Styles - Standards and Guidelines-Documentation Guidelines-Modern Programming Language Features: Type checking-User defined data types-Data Abstraction Exception Handling - Concurrency Mechanism.
UNIT V [13T]
TESTING: Software Quality- Software Quality Dilemma- Achieving Software Quality- Testing: Strategic Approach to software Testing- Strategic Issues - Testing: Strategies for Conventional Software, Object oriented software, Web Apps-Validating Testing- System Testing- Art of Debugging. MAINTENANCE: Software Maintenance-Software Supportability- Reengineering - Business Process Reengineering- Software Reengineering- Reverse Engineering - Restructuring- Forward Engineering- Economics of Reengineering
Text Books
1. Roger S, *"Software Engineering – A Practitioner's Approach",* seventh edition, Pressman, 2010.
2. Pearson Education, *"Software Engineering by Ian Sommerville",* 9th edition, 2010.

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3. Roff: UML: A Beginner's Guide TMH
Reference Books
1. Hans Van Vliet, "Software Engineering: Principles and Practices", 2008.
2. Richard Fairley, "Software Engineering Concepts", 2008.
3. Rohit Khurana, Software Engineering: Principles and Practices, 2nd Edition, Vikas Publishing House Pvt Ltd.
4. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House.
5. Alhir, learning UML, SPD/O'Reily

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Open Courses (XXX5DXX)

BCS5D01 - Introduction to Computers and Office Automation

</div>

Course Objective
1. Understand the terms hardware, software, I/O devices, Networks - LAN, MAN & WAN
2. Understand the features of MS Word
3. Understand the features of MS Excel
4. Understand the features of mS PowerPoint
Course Outcome
CO1:Understand different types of computers and networks, hardware units,system software.
CO2:Learn documentation using Word processing software such as MS word, Open Office Writer.
CO3: Learn calculations using spreadsheet MS Excel and Open Office Writer.
CO4:Learn presentations using Open Office Impress/MS-PowerPoint.
CO5:Able to work documents using various office automation tools.

PO-CO mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4
CO1	0	1	0	3	3	3	3	3	3

CO2	1	3	2	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3
CO4	2	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3

Unit I

Introduction to Computers: Types of Computers - DeskTop, Laptop, Notebook and Netbook.Hardware: CPU, Input / Output Devices, Storage Devices – System - Software - Operating Systems, Programming Languages, Application Software - Networks - LAN, WAN - Client - Server.

Unit II

Documentation Using a Word Processor (OpenOffice Writer / M.S. Word) - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features - Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Unit III

Electronic SpreadSheet (Open Office Calc/MS-Excel) - Introduction to SpreadSheet, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advanced features – Pivot table & Pivot Chart, Linking and Consolidation.

Unit IV

Presentation using (OpenOffice Impress/MS-Power Point): Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

References:

1. Michael Miller, Absolute Beginner's Guide to Computer Basics, Prentice Hall.
2. Russell A. Stultz, Learn Microsoft Office, BPB Publication.
3. H.M.Deitel, P. J. Deitel, et al., Internet & World Wide Web - How to program, Prentice Hall.

BCA5D02 - Web Designing

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Course Objective
1. To learn Web designing.   2. To introduce the fundamentals of the Internet, and the principles of web design.   3. To construct basic websites using HTML and Cascading Style Sheets.   4. To build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.   5. To develop modern interactive web applications and familiarize with HTML editing.
Course Outcome
CO1:Enable students to understand internet and develop web page creation using basic HTML Tags
CO2: Understand the concept of DHTML, HTML editors and write server side scripting programs using java script
CO3: Enable students to create web pages with different styles and formats.
CO4: Develop the students to create programs using basic javascript, Decision making statements, branching statements, looping statements and functions.
CO5: Develop the students to create programs using Java script and HTML.

PO-CO mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4

CO1	1	1	0	2	2	1	2	2	1
CO2	2	1	1	3	2	2	2	3	2
CO3	1	2	1	3	1	1	3	2	1
CO4	2	1	1	2	2	1	2	2	3
CO5	3	2	1	2	1	1	2	2	1

Unit I [12T]

HTML: Introduction - history of html, sgml - structure of html document, web page layout, html tags and types - font type, paragraph formatting, meta data, blockquote, hyperlinks, linking, comments, white space, horizontal ruler,images, ordered and unordered lists, frames, tables, forms

Unit II [12T]

DHTML: Introduction, DHTML technologies, elements of DHTML, document object model, events - window events, form events, keyboard events, mouse events, style sheets, properties used in style sheets - background properties, positioning properties.

Unit III [12T]

Javascript: Introduction and advantages of javascript, java script syntax, writing javascript in html, javascript operators, arrays and expressions, programming constructs - for .. in loop, while loop - dialog boxes and prompts - alert, prompt, confirm methods - functions - built-in functions and userdefined functions, scope of variables, handling events, using event handlers and event methods, form object, properties, methods, form element's properties and methods.

Unit IV [12T]

HTML Editor: Introduction, advantages, creating, opening, saving a web page, building forms, formatting and aligning
text and paragraph, adding lists, styles and themes, linking pages, working with images, frames.

Reference Book:
1. H. M. Dietel, Internet and World Wide Web, Pearson.

PE5D03: Physical Activity, Health and Wellness

COURSE OBJECTIVES

1. To introduce the fundamental concepts of Physical Education Health and Fitness.

2. To provide a general understanding of nutrition, First aid, Yoga and stress management

3. To create awareness regarding hypo-kinetic diseases and Postural deformities

COURSE OUTCOMES

C01. Understand the foundational principles of physical education, health, and wellness, integrating anatomy, physiology, and nutrition knowledge to promote holistic well-being.
C02. Evaluate and apply various fitness methodologies to enhance physical performance, demonstrating an understanding of the relationship between exercise and overall health.
C03. Assess and analyze the components of physical fitness, including strength, flexibility, endurance, and body composition, to design personalized fitness plans.
C04. Apply the scientific principles of yoga to improve physical, mental, and emotional health, recognizing its benefits in promoting relaxation, flexibility, and mindfulness.
C05. Develop strategies for preventing and managing sports injuries, demonstrating proficiency in administering first aid and understanding the importance of prompt intervention in maintaining athlete well-being.

C0-PO-PSO MAPPING

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	1	3	2	1	1	2	2

CO2	3	2	3	1	3	2	1	1	2	2
CO3	3	2	3	1	3	2	1	1	2	2
CO4	2	2	3	1	3	3	1	1	2	3
CO5	2	2	3	1	3	3	1	1	2	3

Module I: Introduction to Physical Education, Health and Wellness (5 hrs)

Definition, aim, objectives and importance of physical education.Definition and Importance of Health.

Meaning and concept of wellness.

Module II: Concept of Fitness (12 hours)

Types of fitness. Definition of Physical Fitness. Types of physical fitness –Health related physical fitness, Performance related physical fitness and Cosmetic fitness. Components of physical fitness %u2013 speed, strength, endurance, flexibility and coordinative abilities. Assessment of physical fitness components. Fitness balance.

Module III: Exercise principles, (5 hrs)

Principles of exercise programme, Types of Exercise. Benefits of Exercise, Exercise and Heart Rate Zone.

Module IV:

Vital signs, Lifestyle/Hypo kinetic diseases and its management (10 hours) Vital signs- Pulse rate, Respiratory rate, Blood pressure, Body temperature, Diseases- Diabetes, Hypertension, Obesity, Osteoporosis,

CHD, arthritis. Fitness assessment- Body mass index, waist-to-hip ratio,

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Module V: First Aid. Nutrition. Postural deformities (8 hrs)

Definition of First Aid, Aim of First Aid, Principles of First

Aid.RICE, ABC of First Aid, First Aid for sprain, strain, Fracture, Bleeding,Drowning and SnakeBite.

Nutritional balance, Nutritional deficiency diseases. BMR Meaning of good posture, causes of poor posture, importance of good posture Postural deformities and corrective measures - Kyphosis, Lordosis, Scoliosis,

Bow leg, Knock knee, Flat foot

Module VI: Science of Yoga, Emotional Control, Stress Management (8 hrs)

Definition and meaning of Yoga, Asana, and Pranayama. Eight limbs of

Ashtanga Yoga Yama, Niyama, Asana, Pranayama, Prathyahara, Dharana, Dhyana, Samadhi. Asanas and its effects: 1. Standing (Balancing) %u2013 Vrikshasana, Padahasthasana, Ardha Chakrasana.

2. Sitting (Meditative) - Vajrasana, Padmasana, 3. Prone lying - Bhujangasana, Salabhasa. 4.

Supine - Uttitha padmasana, Naukasana. 5. Relaxative – Savasana Pranayamas and its effects-1) Surya Bedhana(Heating), 2) Chandra bedhana(Cooling) 3) Nadisudhi (Balancing) Stress - Definition of stress, causes of stress and stress management.

NCSACT10- Seminar- How to become an Entrepreneur
Description: It supports the students to become an **entrepreneur** to develop their ideas and earn money. It focuses on the basics of **entrepreneurship** or how to start a sustainable company.Helps them to set long term goals and short term goals for their business.

Course Objectives

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1. To get basic knowledge about starting and running a company/organization
Course Outcomes
CO1: Set targets /goals themselves for their business to achieve over a period of time
CO2:.To acquire knowledge about financial growth

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

NCSA0C3-Add On Course-lntroductory Concepts of Digital Computing

Description:In semester 5,all the students should enroll for any one of the MOOC COURSE provided by NPTEL.The list of courses will be provided from department.From the list of courses provided,students may choose any one course.The duration of the course will be minimum of 30 hrs.

Course Objectives

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1. Introductory Concepts of Digital Computing, presents the fundamental concepts and techniques used in the designing process of digital computing devices

2. The main focus is to expose learners to the designing of combinational and sequential logic circuits.

3. This course lays a strong foundation to make a big move in the core subjects like Digital Electronics,Computer Organization,Computer Architecture etc and it forms the basics of many of the next level courses

Course Outcomes

CO1:To enable the learners to acquire basic knowledge about digital logic and digital electronic circuits.

CO2:To understand different number systems and conversions between numbers of different bases .

PO-CO-PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	0	3	2	3	3	2

Course Layout/Syllabus

Week : 1
Mod 1 : Introduction to Digital Computing
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Mod 2 : Number Systems : Introduction
Mod 3 : Number Systems : Conversions
Discussion
Assignment 1

Week : 2
Mod 4 : Binary Data Representation
Mod 5 : Binary Arithmetic : Addition and Subtraction
Mod 6 : Binary Arithmetic : Multiplication and Division
Discussion
Assignment 2

Week : 3
Mod 7 : Binary Codes : Part 1
Mod 8 : Binary Codes : Part 2
Mod 9 : Error Correcting and Detecting Codes
Discussion
Assignment 3

Week : 4
Mod 10 : Basic Logic Gates
Mod 11 : Universal Gates
Mod 12 : Boolean Algebra : Part 1
Discussion
Assignment 4

Week : 5
Mod 13 : Boolean Algebra : Part 2
Mod 14 : Simplification of Boolean Expressions
Mod 15 : K-Map : Part 1
Discussion
Assignment 5

Week : 6
Mod 16 : K-Map : Part 2
Mod 17 : Combinational Circuits : Adders - Part 1
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Mod 18 : Combinational Circuits : Adders - Part 2
Discussion
Assignment 6

Week : 7
Mod 19 : Combinational Circuits : Subtractors
Mod 20 : Combinational Circuits : Magnitude Comparators
Mod 21 : Combinational Circuits : Encoder
Discussion
Assignment 7

Week : 8
Mod 22 : Combinational Circuits : Decoder
Mod 23 : Combinational Circuits : Multiplexer
Mod 24 : Combinational Circuits : Demultiplexer
Discussion
Assignment 8

Week : 9
Mod 25 : Sequential Circuits : Introduction
Mod 26 : Sequential Circuits : Latches
Mod 27 : Sequential Circuits : Flip flops - Part 1
Discussion
Assignment 9

Week : 10
Mod 28 : Sequential Circuits : Flip flops - Part 2
Mod 29 : Sequential Circuits : Flip flops - Part 3
Mod 30 : Sequential Circuits : Flip flops - Part 4
Discussion
Assignment 10

Week : 11
Mod 31 : Sequential Circuits : Flip flops - Part 5
Mod 32 : Sequential Circuits : Registers – Part 1
Mod 33 : Sequential Circuits : Registers – Part 2

Discussion
Assignment 11

Week : 12
Mod 34 : Sequential Circuits : Counters – Part 1
Mod 35 : Sequential Circuits : Counters – Part 2
Mod 36 : Sequential Circuits : Counters – Part 3
Discussion
Assignment 12

Semester 6

1. BCA6B11 – Android Programming

No. of sessions: 80

Course Objectives
1. Understand the basic concepts of Android programming.
2. Understand the different types of resources in Android.
3. Develop user interface for Android application.
4. Understand the concept of Menu, Fragment and ActionBar in Android.
5. Understand the concept of persisting data in files and SQLite databases.
Course Outcome
1. Explain the basic concepts of Android programming.
2. Identify the different types of resources in Android.

3.	Design user interface for Android application.
4.	Explain the concept of Menu, Fragment and ActionBar in Android.
5.	Develop an application with database connectivity using Android.

CO-PO/PSO Mapping

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	3	3	3	3	3	3
CO2	3	2	1	3	3	3	3	3	3
CO3	3	2	1	3	3	3	3	3	3
CO4	3	2	1	3	3	3	3	3	3
CO5	3	2	1	3	3	3	3	3	3

Syllabus

Unit I

Introducing the android computing platform, History of android, an- droid software stack, Developing end user application using Android SDK, Android java packages, Setting up the development environment, Installing

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android development tools(ADT), Fundamental components, Android virtual devices, Running on real device, Structure of android application, Application life cycle..

Unit II

Understanding android resources - String resources, Layout resources, Resource reference syntax, Defining own resource IDs - Enumerating key android resources, string arrays, plurals, Colour resources, dimension resources, image resources, Understanding content providers - Android built in providers, exploring databases on emulator, architecture of content providers, structure of android content URIs ,reading data using URIs, using android cursor, working with where clause, inserting updates and deletes, implementing content, Understanding intents basics of intents, available intents, exploring intent composition, Rules for Resolving Intents to Their Components, ACTION PICK, GET CONTENT, pending intents.

Unit III

User interfaces development in android - building UI completely in code, UI using XML, UI in XML with code, Android's common controls - Text controls, button controls, checkbox control, radio button controls, image view, date and time controls, map view control, understanding adapters, adapter views, list view, gridview, spinner control, gallery control, styles and themes, Understanding layout managers - linear layout manager, table layout manager, relative layout manager, frame layout manager, grid layout manager.

Unit IV

Android menus - creating menus, working with menu groups, responding to menu items, icon menu, sub menu, context menu, dynamic menus, loading menu through XML, popup menus, Fragments in Android structure of fragment, fragment life cycle, fragment transaction and back stack, fragment manager, saving fragment state, persistence of fragments, communications with fragments, startActivity() and setTargetFragment(), using dialogs in android, dialog fragments, working with toast, Implementing action bar - tabbed navigation action bar activity, implementing base activity classes, tabbed action bar and tabbedlistener, debug text view layout, action bar and menu interaction, list navigation action bar activity, spinner adapter, list listener, list action bar, standard navigation action bar activity, action bar and search view, action bar and fragments.

Unit V

Persisting data - Files, saving state and preferences - saving application data,creating, saving and retrieving shared preferences, preference framework and preference activity, preference layout in XML, native preference controls,preference fragments, preference activity, persisting the application state, including static files as

resources, Working with file system, SQLLite - SQLLite types,database manipulation using SQLLite, SQL and database centric data model for Android, Android database classes.

References:

 1. Satya Komatineni & Dave MacLean,Pro Android 4, Apress.

 2. Retomeier, Professional Android 4 Application Development, Wrox.

3. Zigurd Mednieks, Laird Dornin, G. Blake Meike, and Masumi Nakamura, Programming Android, O'Reilly

BCA6B12 -Operating Systems   **No. of sessions: 80**

Course Objectives
1.To learn objectives & functions of Operating Systems
2.To understand processes and its life cycle.
3.To learn and understand various Memory and Scheduling Algorithms.

4.To have an overall idea about the latest developments in Operating Systems
Course Outcomes
CO1: Learn the basic concepts of operating systems. and about process management
CO2: Understand and experience the UNIX commands and language constructs in building shell scripts
CO3:Able to compare different process scheduling algorithms and process synchronization
CO4: Learn and apply different memory management techniques
CO5: Explain the basic concepts of mobile operating systems.

CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
CO1	2	2	0	3	2	3	2	2	3
CO2	3	2	1	3	3	2	3	3	3
CO3	3	2	1	2	3	2	2	3	3
CO4	3	3	0	2	2	3	2	2	2
CO5	2	3	1	3	2	2	2	3	3

Unit I

Operating System - Objectives and functions - The Evolution of Operating Systems: Serial Processing, Simple batch Systems, Multi Programmed batch Systems, Time Sharing Systems, Parallel Systems, Distributed Systems, Real time systems. Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads, Concurrency, Principles of Concurrency, Mutual exclusion, Semaphores, Messages, Deadlock: Prevention, Detection, Avoidance.

Unit II

Linux Shell Programming: Introduction – Shells available in Unix: Bourne shell (sh), C shell (csh), TC shell (tcsh), Korn shell (ksh), Bourne Again SHell (bash). Bash: special characters – getting help – man pages – Linux Directory Layout – Command for Navigating the Linux Filesystems: pwd, cd, ls, file, cat, cp, mv, mkdir, rmdir, whereis – Piping and Redirection - Informational Commands: ps, w, id, free – clear, echo, more. File

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permissions – Setting Permissions – Making a file executable. Creating shell programs: comments, variables, operators (arithmetic, relational, logical) – single and double quotes - read – echo – test - conditionalcommands, iterative commands – break – continue - evaluating expressions using expr, bc – strings – grep – arrays.

Unit III

CPU Scheduling: Scheduling Criteria, Scheduling algorithms: FCFS, SJF, Priority, RR, Multilevel, Feedback Queue - Process synchronization, The Critical Section Problem, Synchronization Hardware, Classical Problems of Synchronization: Reader Writer, Dining Philosopher. File and Database System, File System, Functions of organization, Allocation and Free Space Management

Unit IV

Memory Management, Address Binding, Logical Vs Physical Address Space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand Paging, Page Replacement, Thrashing.

Unit V

Protection and security: policy and mechanism, authentication, authorization. Mobile OS: Concepts, history, features, architecture, future scope. Case studies: Android, UNIX kernel and Microsoft Windows NT (concepts only).

Text Books

1. Silberschatz, Galvin and Gagne, Operating System Concepts, John Willey & Sons
2. William Stallings, Operating Systems, Internals and Design Principles, PHI
3. Mendel Cooper, Advanced Bash-Scripting Guide, Available at http://www.tldp.org/LDP/abs/abs-guide.pdf

References:

4. Nutt G.J, Operating Systems: A Modern Perspective, Addison Wesley

BCA6B13- Computer Networks

Objectives

· To learn about transmissions in Computer Networks.
· To learn various Protocols used in Communication.
· To have a general idea on Network Administration.

· Knowledge in data structure.
· Knowledge in Operating System.

Course Outcomes

· CO1 To understand about different network terminologies
· CO2 To familiarize with different layers of network
· CO3 To understand the functions of data link layer and network layer
· CO4 To familiarize with the functions of Transport layer
· CO5 To understand the concept of network security and Cryptography

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	3	1	3	1	3	1	3	2
CO2	2	2	2	2	2	1	2	1	2
CO3	1	3	1	2	1	0	1	2	3
CO4	3	2	1	3	0	2	3	1	2
CO5	2	3	3	2	2	3	1	3	3

Course Outline:

Unit I [16T]

Introduction to Computer networks, Topology, categories of networks, Internetwork, Internet, Network Models, Layered model, OSI and TCP/IP models, Physical layer, Switching - Circuit switching, Packet Switching and Message Switching, DTE - DCE Interface, EIA - 232 interface, X.21 modems.

Unit II [16T]

Data link layer, Error detection and correction, Types of errors, Single CSC error and Burst error, Vertical redundancy check (VRC), longitudinal redundancy Check (LRC), Cyclic Redundancy Check(CRC), Error

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correction - Single CSC error correction, Hamming code Data compression - Huffman code, data link control, Line discipline, Flow control, Error control, Multiple Access, Random Access, ALOHA, pure ALOHA and slotted ALOHA, CSMA/CD and SCMA/CA, Polling, Wired LANs, Ethernet - IEEE standards, Wireless LANs.

Unit III [16T]

Network layer, Networking and Internetworking devices - Repeaters, Bridges, Routers, Gateways, Logical addressing - IPv4 & IPv6 addresses, Network Address Translation(NAT), Internet protocols, internetworking, Datagram, Transition from IPv4 to IPv6, Address Mapping-Error reporting and multicasting - Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link State Routing.

Unit IV [16T]

Transport layer, Process-to-process Delivery: UDP, TCP and SCTP, Congestion control and Quality of Service, Application Layer, Domain Name Systems-Remote Login-Email FTP, WWW, HTTP, Introductory concepts on Network management: SNMP.

Unit V [16T]

Cryptography and Network Security: Introduction – Goals of Security – Attacks - Services and Techniques. Basics of Cryptography: Plain Text - Cipher Text – Encryption – Decryption. Confidentiality: Basics of Symmetric Key Ciphers - Traditional Symmetric Key Ciphers: Substitution, Transposition, Stream & Lock, Modern – Components of Modern Block Cipher – DES - Modern Stream Cipher. Basics of Asymmetric Key Ciphers – RSA Cryptosystem. Integrity: Message – Message Digest – Hash Function. Authentication: MAC. Digital Signature : Analogy with Manual Signature – Process – Signing the Digest – Services – RSA Digital Signature Scheme.

Text Book:

1. Behurouz A Forozan, *Introduction to Data Communications & Networking*, TMH

Reference Books:

1. Andrew S. Tanenbaum, Computer Networks, PHI
2. William Stallings, Data and Computer Communications, VIIth Edition, Pearson Education
3. William Stallings, Cryptography and Network Security, Principles and Practices, Prentice Hall of India.
4. Steven Graham and Steve Shah, Linux Administration: A Beginners Guide, Third Edition, Dreamtech, 2003.

BCA6B16C- Software testing & Quality Assurance

Course Objectives
1. Introduce basic concepts of software testing
2. Understand white box, block box, functional and non functional testing
3.Know in details automation testing and tools used for automation testing

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4.Understand the importance of software quality and assurance software systems development.
Course Outcomes
CO1 - Analyze the different lifecycle models of software development
CO2 - Identify major types testing
CO3 - Enable students to implement the process that should be followed in building an E-commerce presence
CO4 - Helps the students to implement Integration testing and System testing to verify requirements specifications
CO5-Demonstrate the best practices in testing

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	3	1	3	3	3	3	3	3
CO2	1	3	0	1	2	3	3	3	3
CO3	1	3	0	1	2	3	3	3	3
CO4	3	2	2	2	3	3	3	3	3
CO5	3	2	2	2	3	3	3	3	3

UNIT I (12T)

Phases of Software project - Quality Assurance, Quality control - Testing, Verification and
Validation - Process Model to represent Different Phases - Life Cycle models. White-Box
Testing: Static Testing - Structural Testing Challenges in White-Box Testing.

UNIT II (12T)

Black-Box Testing: What is Black, Box Testing?, Why Black, Box Testing?, When to do Black,
Box Testing?, How to do Black, Box Testing?, Challenges in White Box Testing, Integration
Testing: Integration Testing as Type of Testing, Integration Testing as a phase of Testing,

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Scenario Testing, Defect Bash.
UNIT III (12T)
System and Acceptance Testing: system Testing Overview, Why System testing is done?
Functional versus Non, functional Testing, Functional testing, Non, functional Testing,
Acceptance Testing, Summary of Testing Phases.
UNIT IV (12T)
Performance Testing: Factors governing Performance Testing, Methodology of Performance
Testing, tools for Performance Testing, Process for Performance Testing, Challenges.
Regression Testing: What is Regression Testing? Types of Regression Testing, When to do
Regression Testing, How to do Regression Testing, Best Practices in Regression Testing.
UNIT V (12T)
Test Planning, Management, Execution and Reporting: Test Planning, Test Management, Test
Process, Test Reporting, Best Practices. Test Metrics and Measurements: Project Metrics,
Progress Metrics, Productivity Metrics, Release Metrics.

BCA6B14 -Programming Laboratory III: Java and PHP Programming

Course Objectives
1.To practice Java programming
2.To provide basics of JAVA programs and its execution
3.To practice client side and server side scripting
4 .To practice developing dynamic websites
Course Outcomes
CO1:Able to apply OOP in problem solving and develop basic programs.
CO2:Able to develop basic programs on multithreading and exception handling
CO3:Able to create GUI based applications using applets
CO4:Students able to implement dynamic websites using PHP
CO5:Able to develop Web applications with Database Connectivity.

CO-PO/PSO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

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CO								
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	1	3	2	3	3	2
CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	3	3	3	3
CO5	3	2	3	1	3	3	3	3	3

Part A-Java Programming

1. Write a program to find the distance between two points.

2. Write a program to find the sum, difference, product, quotient and remainder of two numbers passed as command line argument.

3. Write a java program to display Fibonacci series up to a limit.

4. Write a java program to display armstrong numbers within a range.

5. Given the sides of a triangle, write a program to check whether the triangle is equilateral, isosceles or scalene and find its area.

6. Read an array of 10 or more numbers and write a program to find the

a) Smallest element in the array

b) Largest element in the array

c) Second largest element in the array

7. Write a program to perform base conversion

a) Integer to binary

b) Integer to Octal

c) Integer to Hexadecimal

8. Write a program to verify De Morgan‟s Law

9. Write a program to merge two arrays.

10. Write a program to find the trace and transpose of a matrix

11. Write java program to find the sum of the digits and reverse of a given number using class and objects.

12. Write a program to sort a set of n numbers using a class.

13. Create a class „Account‟ to represent a bank account. Write a program to deposit and withdraw amounts from the account.

14. Using class and objects, Write a java program to find the sum of two complex numbers
(Hint: Use object as parameter to function).

15. Create a class Time with hh, mm, ss as data members. Write a java program to find the sum of two time intervals (Hint: Use object as parameter to function).

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16. Write a program to count and display total number of objects created to a class (Hint: static members).

17. Write a java program to find the volume of cube, rectangular box, cylinder using function overloading.

18. Create a class student with methods to read and display the student details. Create a derived class result with methods to read marks of 5 subjects. Write a java program to display the total and grade of students, creating objects of class result.

19. Create a class Employee with ID, Name Designation and Dept. Create a child class salary with Basic, HRA, DA and Allowance. Write a program to compute the net salary assuming that HRA is 1250, DA, Allowance are 110% and 35% of the Basic salary.

20. Write a program to demonstrate inheritance hierarchy by using class a base class shape and 'TwoDim' and 'ThreeDim' as sub classes. Create classes „square‟ and 'triangle' derivedfrom TwoDim and 'sphere and 'cube' derived from ThreeDim. A reference variable of shape is used to determine area of various shapes.

21. Write a program to demonstrate the order in which constructors are invoked in multilevel inheritance.

22. Create an abstract class shape with two data members and an abstract method area. Create two child classes rectangle and triangle. Write a program to display the area of the shapes.

23. Create an interface calculator having methods to perform basic arithmetic operation. Write a program to implement the interface to perform operation on integer and float values.

24. Create a class factorial with a method that accept a number and return its factorial in a package P1. Using the factorial class, write a program to find the factorial of a number.

25. Write a multi thread java program for displaying odd numbers and even numbers up to a limit (Hint : Implement thread using Runnable interface).

26. Write a multi thread java program for displaying numbers ascending and descending order (Hint: create thread by inheriting Thread class).

27. Write a program to handle arithmetic exception.

28. Create a user defined exception „MinBalExp‟ to be invoked when the read number is less than a pre-set value.

29. Create a user defined exception „OddValExp‟ to be invoked when the read number is an odd number.

30. Write a program to copy a file to another. Pass the file names as command line arguments

31. Write a program to track keyboard events on an applet.

32. Write an applet to display a rectangle with specified coordinate and colour passed as parameter from the HTML file.

33. Create an AWT application to add, remove items in a list box.

34. Create an AWT application to select gender using radio buttons.

35. Design a window to accept the qualifications of a user using checkboxes.

36. Create an applet for a displaying smiling face.

37. Write a program to display ip address of the system.

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38. Write a program to implement echo server (A server that echo the messages the client sends).
39. Create a database table employee (id, name, design, dept). Write a program to list the employees using JDBC.
40. Write a program to insert a new employee record to the above table

Part B-PHP Programming
HTML and CSS
1. Design a website of an educational institution using framesets and links. A sample design is as shown below.

Top Frame	
Menu Frame	Details Frame

2. Design a webpage that illustrates the use of the following form controls: (i) input controls: single-line text, password, multi-line text. (ii) buttons: submit and reset.
3. Design a webpage that illustrates the use of the following form controls: (i) input controls: check box, radio button, select box (ii) buttons: submit and reset.
4. Design a webpage that illustrates the use of the following form controls: (i) input controls: datalist, multi-select box, grouped select box (ii) buttons: submit and reset.
5. Design a webpage that illustrates the use of field sets and legends.
6. Design a web page to demonstrate Border colors using internal CSS.
7. Design a web page to demonstrate Text alignment using CSS.
8. Design a web page to demonstrate inline CSS.
9. Design a webpage to invert the behavior of the <h1> to <h6> tags using external CSS.
10. Design a webpage for a simple image gallery
JavaScript
11. Write a javascript program to perform find the area and circumference of a circle
12. Write a javascript program to check whether a given number is perfect, abundant or deficient. Use alert box to display the output.
13. Write a javascript program to check whether the given sides can form a triangle. If yes, find the type (isosceles, equilateral and scalene) and area of the triangle. Use prompt dialogue box to accept the sides.
14. Write a javascript program to display the nth prime number. Value of n should be accepted from the user. Validate the value entered by the user: Only positive numbers except 0 are to be accepted.
15. Write a JavaScript program to find all years in which 1st January is a Sunday between a given range (eg:- between 2010 and 2017). Use

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16. Design a webpage to illustrate image rollover.
17. Design a JavaScript program to illustrate the following events: onLoad, onClick, onBlur,onSubmit, onChange.
18. Design a JavaScript program to display the multiplication table of a no accepted from the user.
19. Design a form that accepts two integers. Provide 4 buttons for Add, Subtract, Multiply, Divide. Add JavaScript program to add, subtract, multiply and divide the given numbers when these buttons are clicked. Use output element to display the results.
20. Write a JavaScript program to create a table after accepting row and column numbersfrom the user. Contents of each cell should be corresponding row-column number (e.g. Row-0 Column-0).
21. Write a JavaScript program to store different colors in an array and change the background color of the page using this array elements
22. Write a JavaScript program to create clock with a timing event.
23. Write a JavaScript program for form validation for question numbers 2, 3 and 4.
24. Design a webpage to demonstrate the use of progress HTML element

PHP
25. Write a PHP program to check whether the given number is Armstrong or not.
26. Write a PHP program to check whether a given number is perfect, abundant or deficient.
27. Display the Fibonacci series up to a given number.
28. Create a php program to display the bio data of a person by reading the personal details using an HTML page.
29. Create a login page using database.
30. Create a mysql table student with fields roll no, name, mark, grade. Insert records in the table. Write a PHP program to display the mark list of a student by accepting the register no of the student.
31. Write a php application to generate the pay slip of an employee by accepting name, basic salary and designation. The net salary will be calculated based on the following conditions.

Designation	conveyance allowance	extra allowance
Manager	1000	500
Supervisor	750	200
Clerk	500	100
Peon	250	

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HRA – 25 %

Income tax

Gross <=200 0

2500 < gross <=4000 3%

4000< gross <=5000 5%

Gross >5000 8%

Gross= basic + HRA + conveyance + extra

Net = gross – income tax

32. Create a table "product" with fields item code, itemname, unit price. Write php program to insert 5 records into the table and display it in a table format.

33. Write a php program for delete and update operation on the account table. The account table contain fields such as accountno, name and amount.

34. Write an HTML page to display a list of fruits in a list box. Write php program to display the names of the fruits which are selected by the user.

35. Write php program to store current date/time in a cookie and display the „last visited on„ date time on the web page upon reopening of the same page.

36. Design a PHP page to implement a login screen using sessions. Login details are to be verified from the server side with values stored in a database.

37. Write a php program to create an array and store 10 names in the array. Do the following operations.

a. Display the contents using for each statement.

b. Display the array in a sorted order.

c. Display the array without the duplicate elements

d. Remove the last element and display

e. Display the array in reverse order

f. Search an element in the given array.

38. Design a PHP page to illustrate the use of keygen HTML element.

39. Design a PHP page to illustrate the use of meter HTML element – accept five cities and the temperature of those cities and display the result graphically.

40. Design a PHP page to illustrate the use of file upload – uploading files of a type with a specified size to the web server.

Include any 20 Java Programming Lab questions and 20 PHP Programming Lab questions in the record book.

Note: All lab works should be neatly recorded in a Laboratory Record Book in written form.

However Program results can be pasted in the left hand side of the fare record. All students should have a rough record (observation notebook) too, in which they write all the works to be carried out in the lab prior to his/her

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entering the lab. He/She may also note down the i/p and o/p that he gives for program verification in the observation notebook (rough record).

BCA6B15 -Programming Laboratory IV:Android and Linux Shell Programming

Course Objectives
1.To practice Android programming.
2.To practice user interface applications
3.To practice shell programming
4 .To introduce LINUX basic commands
Course Outcomes
CO1:Able to develop user interface applications
CO2:Apply the knowledge acquired on developing various mobile application using Android
CO3:Students will be able to understand the basic commands of linux operating system and can write shell scripts
CO4:Create or design different scripts using shell programming.
CO5:Able to write simple and complex shell scripts to automate various tasks using shell programming

CO-PO/PSO Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	0	2	0	3	2	3	3	2
CO2	3	2	3	1	3	2	3	3	2
CO3	3	2	3	0	3	3	3	3	3
CO4	3	2	3	0	3	3	3	3	3
CO5	3	2	3	1	3	3	3	3	3

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Part A: Android Programming

1. Programs to understand basic arithmetic operations

2. Programs to understand basic logic operations

3. Programs to understand loops and control statements

4. Programs to understand GUI in android

5. Android application for adding two numbers

6. Develop simple user interface to display message

7. Create two menu items-opening a file-saving a file

8. Inserting values into Spinner control using Text view and Button.

9. Implementation of background image

10. Starting another activity from your own activity using intent

11. Create a new activity that services ACTION-PICK for contact data which display each of the contact in the contact database and lets the user to select one before closing and returning the selected contacts URL to the calling activities

12. Create Android application to linkify a text view to display web and E-mail address as hyperlinks. When clicked they will open the browser and E-mail address respectively

13. Implementation of array adapter

14. Create an alert dialogs used to display a message and offer two button options to continue.

Clicking either button will close the dialog after executing the attached click listener

15. Get data from Text view control and insert into database using SQLite. Another activity shows inserted data in a List View control

16. Load menu item by parsing XML data.

17. Program to implement simple calculator

18. Program to Get IP Address

19. Program to Home and Lock Screen Widget (Temperature Widget)

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20. Create a new contact using intent

21. A Button control shows Date picker and Text view control displays selected date.

22. Insert data into Spinner and delete selected item using SQLite.

23. Program to create simple login screen.

24. Create an Android application to display the map of your locality. Use ACTION_VIEW intent by passing latitude and longitude as parameters.

25. Create an Android application to convert a voice into text (using Google Speech to Text service)

26. Create an Android application to populate a list view by getting names & numbers from a

SQLite database table.

27. Display the saved contacts available in the android phone in a listview using content providers

28. Create an image grid. Images should be placed under the resources section.

29. Create an android app with three tabs. First tab should contain two Edit text and that should accept age and name. In the second tab you need another 3 edit texts that accept education address and phone number. After these information is proved, when the third tab is open it should display all the provided information neatly.

30. Create a custom toast with an Image and a TextView.

31. Apply a Custom List style to a ListView. ListView should have at least 10 Items.

32. Determine the acceleration of your android device along all three axes using accelerometer? (i.e. x,y,z).

33. Capture an Image from the primary camera of an android device and save that picture into the internal storage.

34. Create an app to list files under a given folder name in an EditText

35. Fetch data from an arbitrary URL given in an EditText and display it in a TextView

36. Create an SQLite database named student. Accept student details from the MainActivity and save it in the table called student. Display the calculated result in the second activity when a button on the MainActivity is clicked.

37. Create an android app to switch the wifi on and off also illustrate the use of permission in android?

38. Create a spinner that takes data from the String.xml file.

39. Create a simple android application that opens the default messaging application available in the android device?

40. Create an app to display message in the notification bar?

Part B: Shell Programming

1. Write a script to find area of a circle

2. Write a shell script to find given number is even or odd

3. Write a shell script to make a menu driven calculator using case

4. Write a shell script to find the greatest of three numbers

5. Write a shell script to compute mean and standard deviation of three numbers

6. Write a shell script to find sum of all digits from a given number

7. Write a shell script to find reverse of a number

8. Write a shell script to find prime numbers upto a given number

9. Write a shell script to find n fibonacci numbers

10. Write a shell script to check whether a given number is Amstrong or not

11. Write a shell script to reverse a string and check whether a given string is palindrom or not

12. Write a shell script to count no of line,words and characters of a input file

13. Code for Write a shell program to convert all the contents into the uppercase in a particular file in Unix

14. Write a script to find the value of one number raised to the power of another. Two numbers are entered through the keyboard.

15. Write a shell script find the factorial of a given number

16. An employee Basic salary is input through keyboard where da is 40% of basic salary and hra is 20% of basic salary. Write a program to calculate gross salary

17. Write a shell script to find the average of the number entered as command line arguments

18. Code for Shell script which whenever gets executed displays the message "Good

Morning/Good afternoon /Good Evening "depending on the time it get executed"

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19. Write a shell script to Display Banner, calander of given year

20. Code for a program to display current date and time, number of users , terminal name, login date and time

21. Write a shell script which uses all the file test operators

22. Write a shell script to copy the contents of file to another. Input file names through command line. The copy should not be allowed if second file exists.

23. Write a shell script to find number of vowels, consonants, numbers in a given string.

24. Code for Shell script to perform operations like display, list, make directory and copy, rename, delete

25. Write a shell script to compare two files and remove one of them if they are same

Include any 15 Android Programming Lab questions and 15 Shell Programming

Lab questions in the record book.

Note: All lab works should be neatly recorded in a Laboratory Record Book in written form. However Program results can be pasted in the left hand side of the fare record. All students should have a rough record (observation note book) too, in which they write all the works to be carried out in the lab prior to his/her entering the lab. He/She may also note down the i/p and o/p that he gives for program verification in the observation note book (rough record)

9. Detailed Description of Activities

NCSACT13 –Project and Industrial visit

Description: The objective of the BCA final project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle (SDLC). The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during five semesters of study in BCA Programme. The objective of industrial visit is to give students an insight into the regular, internal workings of a company. It gives good understanding of the industry and helps in building up useful case studies for improving the quality of future teaching. It provides an ability to identify research programmes of industrial importance..

Course Objectives
To provide practical knowledge on software development process
To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
Course Outcomes
CO1: To learn as to how theatrical concepts are put into action, thereby aiding their practical learning.
CO2:.To enhance interpersonal skills and communication techniques and to become more aware of industry practices and regulations

PO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	3	3

NCSACT12-Workshop- Introduction to Manual & Automation testing

Description: It aims to find the bugs in the application under test. It is preliminary testing, must be carried out prior to start automating the test cases and also needs to check the feasibility of automation testing. The Test Plan is created & followed by the tester to ensure that the comprehensiveness of testing while executing the test cases manually without using automation testing tool.It is not necessary to have knowledge of any testing tool for manual software testing.

Course Objectives
1. To get basic knowledge to find the bugs in an application by providing testcases
Course Outcomes
CO1: To acquire knowledge manual and automation testing

CO2:.To acquire knowledge about testing tools

PO / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

NCSACC5-Additional Certification Course

An additional certification course on "An Introduction to Image processing and Machine Learning" will be provided to students.The duration of the course will be 5 hours.The faculties from the Department of Computer Science will handle sessions.

Course Objectives
To be familiar with processing of the images, recognition of the pattern and their applications.
To introduce Machine Learning and enable students to think more scientifically
Course Outcomes
CO1: Enhance knowledge in understanding and analyzing problems

PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

CO									
CO1	3	2	3	0	3	3	3	3	3
CO2	3	2	3	0	3	3	3	3	3

Topics:

1. Introduction to Image Processing
2. Libraries involved for an Image Processing
3. Why do we need Image Processing?
4. Steps in Image Processing
5. Introduction to Machine Learning : Basic definitions, types of learning

10. Course Evaluation and CIE

Total marks for each core, elective course is 75 and lab courses shall be 100 marks and Industrial Visit & Project Evaluation cum Programme viva- voce shall be 100 marks and open course shall be 75 marks. The evaluation scheme for each course shall contain two parts (1) Internal evaluation (2) external evaluation. 20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation.

EXTERNAL EVALUATION

There shall be University examinations for each course at the end of each semester. Practical examinations shall be conducted by the University at the end of second, fourth and sixth semesters. External evaluation of Project, Industrial Visit Report and Programme viva-voce shall be conducted along with the project evaluation at the end of the sixth semester. External evaluation carries 80% of marks, i.e., 60 marks, for each theory course.The model of the question paper for external examination for theory courses of 2Hours duration:

The students can answer all the questions in Sections A and B. But there shall be Ceiling in each section.

1. Section A: Short answer type carries 2 marks each - 12 questions (Ceiling - 20)

2. Section B: Paragraph/ Problem type carries 5 marks each - 7 questions (Ceiling - 30)

3. Section C: Essay type carries 10 marks (1 out of 2)- (Ceiling - 10)

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The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation and answer keys shall be provided by the University. The external examination in practical courses shall be conducted by two examiners, one internal and an external, appointed by the University. The project evaluation with Programme viva voce will be conducted by two examiners, one internal and an external (appointed by the University), at the end of the sixth semester. No practical examination will be conducted in the odd semester. Practical examinations for BCA Programme shall be conducted in the even semesters 2, 4 and 6.

The model of the question paper for external examination (lab courses) of 3 Hours duration shall be:

1. Section A: One marked question of 30 Marks from Programming Lab Part A is to be attempted (Design Algorithm/Flowchart/Interface: 10 Marks, Code: 10 Marks Result: 10 Marks. Total 30 Marks)

2. Section B: One marked question of 30 Marks from Programming Lab Part B is to be attempted (Design Algorithm/Flowchart/Interface: 10 Marks, Code: 10 Marks Result: 10 Marks. Total 30 Marks)

3. Section C: Lab viva voce (Total 10 Marks)

4. Section D: Lab Record (Total 10 Marks)

Project guidelines – Students must be encouraged to do projects in the latest tools or tools appropriate for their topic. Department should conduct a monthly evaluation of the project and give necessary instructions to the students as and when required. Number of students in a project group must be limited to 4.The scheme of evaluation for project cum Programme viva voce shall be

1. Relevance of the Topic, Statement of Objectives (Total 15 Marks)

2. Methodology (Reference/ Bibliography, Presentation, quality of Analysis/Use of Statistical Tools) (Total 15 Marks)

3. Findings and recommendations (Total 20 Marks)

4. Project cum Programme Viva Voce (Total 20 Marks)

5. Report of Industrial visit (Total 10 Marks)

Audit course: The students can attain only pass (Grade P) for these courses. At the end of each semester (up to fourth semester) there will be an examination conducted by the college from a pool of questions set by the University. The students can also attain the credits through online courses like SWAYAM, MOOC etc. The College will send the list of passed students to the University at least before the commencement of fifth semester examination.

EVALUATION AND GRADING

Evaluation (both internal and external) is carried out using Mark system. The Grade on the basis of total internal and external marks will be indicated for each course, for each semester and for the entire programme. Indirect Grading System in 10-point scale is as below:

Ten Point Indirect Grading System

Percentage of Marks (Both Internal &External put together)	Grade	Interpretation	Grade point Average (G)	Range of grade points	Class
95 and above	O	Outstanding	10	9.5 -10	First Class with Distinction
85 to below 95	A+	Excellent	9	8.5 -9.49	
75 to below 85	A	Very good	8	7.5 -8.49	
65 to below 75	B+	Good	7	6.5 -7.49	First Class
55 to below 65	B	Satisfactory	6	5.5 -6.49	
45 to below 55	C	Average	5	4.5 -5.49	Second Class
35 to below 45	P	Pass	4	3.5 -4.49	Third Class
Below 35	F	Failure	0	0	Fail
Incomplete	I	Incomplete	0	0	Fail
Absent	Ab	Absent	0	0	Fail

CURRICULUM FRAMEWORK AND SYLLABUS
FOR OUTCOME BASED EDUCATION IN
Degree of Master of Science (MSc CS) Computer Science Program
FOR THE STUDENTS ADMITTED FROM
THE ACADEMIC YEAR 2020-21 ONWARDS

Naipunnya Institute of Management and Information Technology
(Affiliated to the University of Calicut , Accredited by NAAC with B++,ISO 9001-2015 Certified)
Pongam ,Koratty East , Thrissur District ,Kerala - 680308

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DEPARTMENT OF COMPUTER SCIENCE

VISION

"Be the very pinnacle of academic and research excellence in Computer Applications"

MISSION

As a Department, we are committed to

- Achieve academic excellence in Computer Applications through innovative teaching and learning processes.
- To prepare the students to be professionally competent to face the challenges in the industry.
- Promote inter-disciplinary research among the faculty and the students to create state of art research facilities.
- To promote quality and ethics among the students.
- Motivate the students to acquire entrepreneurial skills to become global leaders.

Courses Offered

- BSc Computer Science
- BCA
- MSc Computer Science

PROGRAMME OBJECTIVES

The course of the MSc (Computer Science) Programme is designed with the following objectives:

1. To equip students to take up challenging research-oriented responsibilities and courses for their higher studies/profession.

2. To train and equip the students to meet the requirements of the Software industry in the country and outside.

3. To motivate and support the students to prepare and qualify challenging competitive examinations such as JRF/NET/JAM/GATE etc.

2. PROGRAMME OUTCOME (PO)

After the successful completion of the Post Graduate Programme, MSc Computer Science at University of Calicut, a student would have :

PO1	**Advanced Problem-Solving Skills**: Graduates will demonstrate the ability to identify, analyze, and solve complex, real-world problems within their field of study, applying innovative and evidence-based solutions.

PO2	**Mastery of Advanced Research Methods**: Graduates will master advanced research methodologies, including the design, execution, and dissemination of original research, contributing to the body of knowledge in their discipline.
PO3	**Professional Development and Career Readiness:** Graduates will be well-prepared for their chosen careers, possessing the necessary skills, knowledge, and experience to excel in their professional roles or pursue further advanced studies.
PO4	**Leadership and Collaborative Abilities:** Graduates will exhibit leadership qualities and the ability to work collaboratively in diverse teams, recognizing the value of teamwork, and contributing effectively to the achievement of common goals.
PO5	**Community Engagement and Service:** Graduates will engage in community service and outreach, applying their expertise to address societal issues and contribute to the betterment of the community and beyond.

3. PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1	Evaluate complex real-world problems by applying principles of theoretical computing, engineering and Mathematical models.
PSO2	Modern Tool usage: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
PSO3	Understand all dimensions of the concepts of software application development ,projects and Aware the students to publish their work in reputed journals.
PSO4	Conceive Project Management capabilities to solve real world problems in accordance to the needs of the industry, in a specific time frame and to address the challenging requirements coming from the enterprise applications
PSO5	Design and develop computer programs/computer-based systems in the field of Computer Sciences viz. Computational Intelligence, Machine learning, Web technology, Information Retrieval Systems, Data Analytics, Communication and networking.

4. PROGRAMME STRUCTURE

1. The Programme includes three types of courses, viz., Core courses (Code C), Elective Courses (Code E) and Audit Courses (Code A).

2. Every student of the MSc Computer Science Programme shall have to work on a project/dissertation of not less than 8 credits under the supervision of a faculty member as per the curriculum. Project/dissertation shall be treated as Core Courses. Project Work is mandatory for all regular Programmes and Comprehensive Viva-voce is optional and these shall be done in the end semester. The combined Credit for the Project Work and Comprehensive Viva-voce shall not be more than 8 (eight) credits subject to a minimum of 4 (four) credit for Project Work. All students have to submit a Project Report/Dissertation in the prescribed structure and format as a part of the Project Work undertaken.

3. Total credit for the Programme shall be 80 (eighty), this describes the weightage of the course concerned and the pattern of distribution is as detailed below

i) Total Credit for Core Courses shall not be less than 60 (sixty) and not more than 68 (sixty-eight).

ii) Total Credit for Elective Course shall not be less than 12 (twelve) and not more than 20 (Twenty).

iii) Total Credits for Comprehensive Viva-voce and Project Work combined together shall be 8 (eight) subject to a minimum of 4 (four) credit for Project Work.

iv) Total credit in each semester shall vary between 18 to 22.

v) No course shall have less than 2 credits and more than 5 credits.

1. Elective courses shall be spread over either in the Third & Fourth Semesters combined.

2. Audit Courses: There will be two Audit Courses (Ability Enhancement Course & Professional Competency Course) with 4 credits each. These have to be done one each in the first two semesters. The credits will not be counted for evaluating the overall SGPA & CGPA. The colleges shall conduct examinations for these courses and have to intimate /upload the results of the same to the University on the stipulated date during the III Semester. Students have to obtain only minimum pass requirements in the Audit Courses.

3. A student shall accumulate a minimum of 80 credits for the successful completion of the Programmes.

5. DURATION OF THE PROGRAMME

1. The minimum duration for completion of a four semester PG Programme is two years. The maximum period for completion is 4 years.

2. The duration of each semester shall be 90 working days, inclusive of examinations, spread over five months.

3. Odd semesters shall be held from June to October and even semesters from November to March subject the academic calendar of the University.

ATTENDANCE

1. The students admitted in the PG Programmes in affiliated colleges shall be required to attend at least 75 percent of the total number of classes (theory/practical) held during each semester. The students having less than prescribed percentage of attendance shall not be allowed to appear for the University examination.

2. Condonation of shortage of attendance for a maximum of 9 days (10% of the working days in a semester) in the case of single condonation and 18 days (20% of the working days in a semester) in the case of double condonation in a semester subject to a maximum of two times (for single condonation only) during the whole period of Post Graduate Programme may be granted by the University as per the existing procedures. In the case of double condonation, only one condonation shall be allowed during the entire Programme.

3. Benefit of condonation of attendance will be granted to the students on health grounds, for participating in University Union activities, meeting of the University bodies /Govt.bodies and participation in other extracurricular activities on production of genuine supporting documents, with the recommendation of the Head of the Department concerned.

4. A student who is not eligible for such condonation shall be observed the provisions as per clause 6.4 of this regulation. The principal should intimate the details of these candidates at the commencement of the next semester.

5. Women students can avail maternity leave as per the existing university rules.

EXAMINATION

1. There shall be a University examination at the end of each semester.

2. Practical examinations shall be conducted by the University at the end of each semester. There will be one internal and one external examiner for the conduct of End Semester Practical examination.

3. Project Work / Dissertation shall be evaluated at the end of the Programme only. There shall be both Internal and External evaluation for the Project Work.

4. There shall be one end-semester examination of 3 hours duration for each theory course and practical course.

EVALUATION AND GRADING

1. Evaluation: The evaluation scheme for each course shall contain two parts; (a) Internal /Continuous Assessment (CA) and (b) External / End Semester Evaluation (ESE).

2. Of the total, 20% weightage shall be given to Internal evaluation / Continuous assessment and the remaining 80% to External/ESE and the ratio and weightage between Internal and External is 1:4.

3. Primary evaluation for Internal and External shall be based on 6 letter grades (A+, A, B, C, D and E) with numerical values (Grade Points) of 5, 4, 3, 2, 1 & 0 respectively.

4. Grade Point Average: Internal and External components are separately graded and the combined grade point with weightage 1 for Internal and 4 for external shall be applied to calculate the Grade Point Average (GPA) of each course. Letter grade shall be assigned to each course based on the categorization based on Ten-point Scale.

5. Evaluation of Audit Courses: The examination and evaluation shall be conducted by the college itself either in the normal structure or MCQ model from the Question Bank and other guidelines provided by the University/BoS. The Question paper shall be for minimum 20 weightage and a minimum of 2 hour duration for the examination. The result has to be intimated / uploaded to the University during the Third Semester as per the notification of the University.

INTERNAL EVALUATION – CONTINUOUS ASSESSMENT

1. This assessment shall be based on a predetermined transparent system involving periodic written tests, assignments, seminars and viva-voce in respect of theory courses and based on tests, lab skill and records/viva in respect of practical courses.

2. The criteria and percentage of weightage assigned to various components for internal evaluation are as follows:

(a) Theory: The weightage assigned to various components for internal evaluation for theory papers is as shown below.

To ensure transparency of the evaluation process, the internal assessment grade awarded to the students in each course in a semester shall be published on the notice board at least one week before the commencement of external examination. There shall not be any chance for improvement for internal grade.

The course teacher shall maintain the academic record of each student registered for the course, which shall be forwarded to the University, through the college Principal.

Sl.No	Component	Percentage	Weightage
1	Examination /Test	40%	2
2	Seminars /Presentation	20%	1
3	Assignment	20%	1
4	Attendance	20%	1

(b) Practical: The mark distribution to award internal continuous assessment marks for practical course should be as follows:

Sl.No	Component	Percentage	Weightage
1	Lab skill	40%	4
2	Records/Viva	30%	3
3	Pratical test	30%	3

3. Grades shall be given for the internal evaluation based on the grades A+, A, B, C, D & E with grade points 5,4,3,2, 1 & 0 respectively. The overall grades shall be as per the Ten Point scale.

4. There shall be no separate minimum Grade Point for internal evaluation.

5. To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be published on the notice board before 5 days of commencement of external examination.

6. There shall not be any chance for improvement of internal marks.

7. The course teacher shall maintain the academic record of each student registered for the course, which shall be forwarded to the University, through the college Principal, after being endorsed by the Head of the Department.

8. For each course there shall be class test/s during a semester. Grades should be displayed on the notice board. Valued answer scripts shall be made available to the students for perusal.

9. Each student shall be required to do assignment/s for each course. Assignments after valuation must be returned to the students. The teacher shall define the expected quality of the above in terms of structure, content, presentation etc. and inform the same to the students. Punctuality in submission is to be considered.

10. Every student shall deliver Seminar / Presentation as an internal component for every course and must be evaluated by the respective course teacher in terms of structure, content, presentation and interaction. The soft and hard copies of the seminar report are to be submitted to the course teacher.

11. All the records of Continuous Assessment (CA) must be kept in the college and must be made available for verification by university, if asked for. Calculation of overall internal grade for one theory course will be done as shown below:

Calculation of overall internal grade for one Lab Course will be done as shown below:

Components	Weightage (W)	Grade Awarded	Grade Point(GP)	Weighted GP	Overall Grade of the course
Examination /Test	4	A	4	16	Weighted GP/Total Weight 43/10 = 4.30
Seminars / Presentation	3	A+	5	15	
Assignments	3	A	4	12	
Total	10			43	O

Components Weightage

Components	Weightage (W)	Grade Awarded	Grade Point(GP)	Weighted GP	Overall Grade of the course
Lab Skill	2	A	4	8	
Records/viva	1	A+	5	5	Weighted GP/Total Weight 22/5 = 4.40
Practical Test	1	A	4	4	
Viva-voce	1	A+	5	5	
Total	5			22	

EXTERNAL / END SEMESTER EVALUATION (ESE)

1. The semester-end examinations in theory courses shall be conducted by the University with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation.

2. After the external evaluation, only Grades are to be entered in the space provided in the answer script for individual questions and calculations need to be done only up to the Cumulative Grade Point (CGP) and all other calculations including grades are to be done by the University.

3. Students shall have the right to apply for revaluation or scrutiny as per rules within the time permitted for it.

4. Photocopies of the answer scripts of the external examination shall be made available to the students for scrutiny on request by them as per rules.

5. The external evaluation shall be done immediately after the examination preferably in a Centralized Valuation Camp.

5. The language of writing the examination shall be English.

6. Pattern of questions for external/ESE (theory courses):

a. Questions shall be set to assess the knowledge acquired, standard, and application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to

synthesize knowledge. Due weightage shall be given to each module based on content/teaching hours allotted to each module.

b. It has to be ensured that questions covering all skills are set. The setter shall also submit a detailed scheme of evaluation along with the question paper.

c. A question paper shall be a judicious mix of short answer type, short essay type /problem solving type and long essay type questions.

d. The question shall be prepared in such a way that the answers can be awarded A+, A, B, C, D, E Grades.

e. Weightage: Different types of questions shall be given different weightages to quantify their range given in the following model:

Sl. No.	Type of Questions	Individual weightage	Total Weightage	Number of questions to be answered
1	Short Answer type questions	2	$2×4 = 8$	4 out of 7
2	Short essay/ problem solving type	3	$3×4 = 12$	4 out of 7
3	Long Essay type questions	5	$5×2 = 10$	2 out of 4
Total			30	18

A sample ESE evaluation sheet of a theory course is illustrated below:

Type of Question	Qn. No	Grade Awarded	Grade Point	Weightage	Weighted Grade Point	Calculation
Short Answer type	1	A+	5	2	10	
	2	-	-	-	-	
	3	A	4	2	8	
	4	C	2	2	4	
	5	-	-	-	-	Overall Grade of the theory paper = Sum of Weighted Grade Points / Sum of the weightage 115/30 = 3.83 = Grade A+
	6	A	4	2	8	
	7	-	-	-		
Medium Essay type	8	B	3	3	9	
	9	A+	5	3	15	
	10	-	-	-	-	
	11	-	-	-	-	
	12	-	-	-	-	
	13	A	4	3	12	
	14	B	3	3	9	
Long Essay type	15	A+	5	5	25	
	16	-	-	-	-	
	17	-	-	-	-	
	18	B	3	5	15	
	TOTAL			30	115	

7. End Semester Evaluation in Practical Courses shall be conducted and evaluated by both Internal and External Examiners.

Mark distribution for practical courses shall be as follows:

Component	Weightage
Algorithm/Flow diagram/UI diagram/Class	6
Implementation	6
Result/ Output	6
Record	6
Viva	6
Total	**30**

A sample ESE evaluation sheet of a theory course is illustrated below:

Type of Question	Grade Awarded	Grade Point	Weightage	Weighted Grade Point	Calculation
Algorithm/Flow diagram/UI diagram/Class Diagram	A	4	6	24	
Implementation	A	4	6	24	114/30 = 3.80
Result/ Output	B	3	6	18	
Record	A	4	6	24	
Viva	A	4	6	24	
Total			**30**	**114**	

EVALUATION OF PROJECT WORK / DISSERTATION

1. There shall be External and Internal evaluation for Project Work done and the grading system shall be followed.

2. One component among the Project Work evaluation criteria shall be Viva-voce (Project Work related) and the respective weightage shall be 40%.

3. Consolidated Grade for Project Work is calculated by combining both the External and Internal in the Ratio of 4:1 (80% & 20%).

4. For a pass in Project Work, a student has to secure a minimum of P Grade in External and Internal examination combined. If the students could not secure minimum P Grade in the Project work, they will be treated as failed in that attempt and the students may be allowed to rework and resubmit the same in accordance with the University exam stipulations. There shall be no improvement chance for Project Work.

5. The External and Internal evaluation of the Project Work shall be done based on the following criteria and weightages as detailed below:

Sl. No	Criteria	% of Weightage	Weightage	
			External	Internal
1	Relevance of the topic and Statement of problem, Methodology & Analysis Quality of Report & Presentation	60%	24	6
2	Viva-voce	40%	16	4
Total Weightage		**100%**	**40**	**10**

Sl.

The first component for 60% weightage can be sub-divided into following project implementation components:

SlNo	Components	Weightage	
		External	Internal
1	Relevance of the Topic, Statement of Objectives, Methodology	2	2
2	Quality of Literature Survey/Product Review	2	
3	Quality of Analysis Phase	2	
4	Quality of Design Phase	2	
5	Quality of Implementation/Simulation	4	2
6	Quality of Testing/Result Analysis	2	
7	Quality of Contributions	2	
8	Identification of Future Work	1	2
9	Quality of Project Report	4	
10	Publications/Presentations out of the Project Work*	1	
11	Quality of Presentation	1	
12	Demonstration of the Project Work	1	
13	General Viva Voce	16	4
Total		**40**	**10**

DIRECT GRADING SYSTEM

1. Direct Grading System based on a 10 – Point scale is used to evaluate the performance (External and Internal Examination of students)

2. For all courses (Theory & Practical)/Semester/Overall Programme, Letter grades and GPA/SGPA/CGPA are given on the following way:

a. First Stage Evaluation for both Internal and External done by the Teachers concerned in the following Scale:

Grade	Grade Points
A+	5
A	4
B	3
C	2
D	1
E	0

b. The Grade Range for both Internal & External shall be :

Letter Grade	Grade Range	Range of Percentage (%)	Merit Indicator
O	4.25 - 5.00	85.00 - 100.00	Outstanding
A+	3.75 - 4.24	75.00 - 84.99	Excellent
A	3.25 - 3.74	65.00 - 74.99	Very Good
B+	2.75 - 3.24	55.00 - 64.99	Good
B	2.50 - 2.74	50.00 - 54.99	Above Average
C	2.25 - 2.49	45.00 - 49.99	Average
P	2.00 -2.24	40.00 - 44.99	Pass
F	< 2.00	Below 40	Fail
I	0	-	Incomplete
Ab	0	-	Absent

5.SEMESTER WISE COURSE

SEMESTER I

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
1.1	CSS1C01	Discrete Mathematical Structures	4	1	4	5	4	0	4
1.2	CSS1C02	Advanced Data Structures	4	1	4	5	3	2	5
1.3	CSS1C03	Theory of Computation	4	1	4	5	4	0	4
1.4	CSS1C04	The Art of Programming Methodology	4	1	4	5	2	2	4
1.5	CSS1C05	Computer Organization Architecture	4	1	4	5	4	0	4
1.6	CSS1L01	Practical I	2	1	4	5	0	4	4
1.7	CSS1A01	Introduction to Research (Ability Enhancement Audit Course)	4	5	0	5	0	0	0
Total Credits (Excluding Audit Course): 22							**17**	**8**	**25**

SEMESTER II

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
2.1	CSS2C06	Design and Analysis of Algorithms	4	1	4	5	4	0	4
2.2	CSS2C07	Operating System Concepts	4	1	4	5	3	2	5
2.3	CSS2C08	Computer Networks	4	1	4	5	4	0	4
2.4	CSS2C09	Computational Intelligence	4	1	4	5	2	2	4
2.5	CSS2C10	Principles of Software Engineering	4	1	4	5	4	0	4
2.6	CSS2L02	Practical II	2	1	4	5	0	4	4
2.7	CSS2A02	Term Paper (Professional Competency Audit Course)	4	5	0	5	0	0	0
Total Credits (Excluding Audit Course): 22							**17**	**8**	**25**

SEMESTER III

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
3.1	CSS3C11	Advanced Database Management System	4	1	4	5	3	1	4
3.2	CSS3C12	Object Oriented Programming Concepts	4	1	4	5	2	3	5
3.3	CSS3C13	Principles of Compilers	4	1	4	5	4	0	4
3.4	CSS3E01	Elective I	4	1	4	5	4	0	4
3.5	CSS3E02	Elective 2	4	1	4	5	4	0	4
3.6	CSS3L03	Practical III	2	1	4	5	0	4	4
Total Credits (Excluding Audit Course): 22							**17**	**8**	**25**

SEMESTER IV

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
4.1	CSS4E03	Elective 3	3	1	4	5	5	0	5
4.2	CSS4E04	Elective 4	3	1	4	5	5	0	5
4.3	CSS4P01	Project Requirements Analysis & Design Related Discussion	8	1	4	5	3	1	4
		Project Coding, Testing & Implementation Related Discussion					2	2	4
		Project Evaluation & Assessment					2	0	2
		Project Lab Work					0	5	5
Total Credits (Excluding Audit Course): 14							**17**	**8**	**25**

SEMESTER I

CSS1C01 – DISCRETE MATHEMATICAL STRUCTURES

Objectives: To introduce discrete mathematics concepts necessary to understand the basic foundation of Computer Science.

Course Outcome

CO1: Verify the validity of an argument using propositional and predicate logic.

CO2: Understand allocations of set theory and operations on set and apply operations of relations and functions in discrete structures

CO3: Understand applications of Lattices and Boolean algebra in the computer science domain.

CO4: Identify Group, Ring and Field in Group Theory

CO5: Apply the concepts of graph theory and trees to formulate problem solving and understand applications of Graph Theory and Tree

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	0	3	2	3	0	2
CO2	2	2	1	2	0	3	1	1	0	2
CO3	1	0	0	1	1	3	2	2	1	2
CO4	1	2	1	0	0	2	1	2	0	2
CO5	3	2	1	1	0	3	2	1	0	3

Course Outline

Unit I: Sets and Mathematical Logic: Set Theory - Types of sets, Set operations, Principles of Inclusion and Exclusion. Mathematical Logic - Propositional Calculus - Statement, Connectives, Conditional and Biconditional, Equivalence of Formula, Well Formed Formula, Tautologies, Duality Law, Functionally Complete Sets of Connectives, Normal Forms, Theory of Inference for the Statement Calculus, Predicate Calculus - Statement Functions, Variables and Quantifiers, Free and Bound Variables, Theory of Inference for the Predicate Calculus.

Unit II: Functions and Relations: Functions – Types of Functions, Composition of Functions and Inverse Functions. Relations - Relations and Their Properties, Functions as relations, Closure of Relations, Composition of relations, Equivalence Relations and Partitions. Partial Ordering, Hasse Diagram. The Pigeon Hole Principle.

Unit III: Lattices and Boolean Algebra - Lattices and Algebraic Systems, Principles of Duality, Basic Properties of Algebraic Systems Defined by Lattices, Distributive Lattices and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Boolean Expressions.

Unit IV: Group Theory – Definition and Elementary Properties - Permutation Groups, Cyclic Groups – Subgroups - Cosets and Lagrange's Theorem, Semigroup and Monoid. Homeomorphism and Isomorphism. Rings, Integral Domains and Fields.

Unit V: Graph Theory – Introduction, Directed Graph, Undirected Graph, Connected and Disconnected Graphs, Bipartite Graph, Complete Bipartite Graph, Isomorphic Graphs, Subgraph. Paths and Circuits. Shortest Paths in Weighted Graphs - Dijkstra's Algorithm. Eulerian Paths and Circuits, Hamiltonian Paths and Circuits. Trees - Spanning Trees and CutSets, Minimum Spanning Trees - Kruskal's Algorithm, Prim's Algorithm.

References:

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2. Alan Doerr and Kenneth Levassur, Applied Discrete Structure for Computer Science, Galgotia Publications Pvt. Ltd, ISBN: 9780574217554.

3. J. K. Sharma, Discrete Mathematics, Macmillan Publishers India Limited, ISBN: 1403924759.

4. J. P. Tremblay and R. Manohar, Discrete Mathematical Structures with Application to Computer Science, McGraw-Hill Companies, ASIN: B001FPXR5Y.

CSS1C02 – ADVANCED DATA STRUCTURES

Objective:

To introduce basic and advanced data structures dealing with algorithm development and problem solving.

Course Outcome

CO1: Summarize different categories of data structures and design algorithms to perform operations with linear and non – linear data structures.
CO2: Describe how arrays, linked lists, stacks, queues, trees and graphs are represented in memory and used by algorithms.

CO3: Describe common applications for arrays, linked lists, stack, queue, tree and graphs.

CO4: Demonstrate different methods for traversing trees and describe various types of trees and heap structures.

CO5: Design and implement an appropriate hashing function for an application and Discuss the computational efficiency of the principal algorithms for sorting, searching and hashing.

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	0	0	3	0	0	0	0	0	0
CO2	3	0	0	3	3	3	3	0	0	3
CO3	0	0	0	3	1	3	0	0	0	0
CO4	0	0	0	3	0	0	0	0	0	0
CO5	2	0	0	3	0	2	0	0	0	0

Unit I:

Data structure - definition - types & operations, characteristics of data structures - Abstract Data Type (ADT) – algorithms - concepts - definition - objectives of algorithms - quality of an algorithm - space complexity and time complexity of an algorithm.

Unit II:

Counting Techniques: Basic counting techniques - permutations and combinations, asymptotic behaviour of functions. Linear data structures - Arrays - records - representation - data structure operations - traversing, inserting and deleting - sorting and searching – sorting algorithms - linear search & binary search - complexity. Linked lists - operations and implementations, - Stack - operations and its implementations (both array and linked list) - Applications - parsing arithmetic expressions, conversion and evaluating expressions. Recursion - characteristics of recursion, types of recursion applications of recursion in algorithms - comparison of recursive and non-recursive algorithms. Queue - operations and its implementations (both array and linked list) - circular queue - dequeue - priority queues, recursive lists, heterogeneous lists, deterministic skip lists, doubly linked lists and circular lists sparse matrix- representation.

Unit III:

Non-linear Data Structures - trees - terminology - tree traversals algorithms – Binary trees - threaded binary trees - binary search trees - traversals and operations on BST heap Tree - balanced trees - M-way trees - B and B+ trees, Red Black Tree, Digital Search Tree, Tries, Treaps, Huffman algorithm for extended binary tree - operations and their implementation. Graphs - representation of graphs – operations - traversals and their implementation.

Unit IV:

Hashing - overview of hashing - hash tables - hash functions and their computations open addressing - linear probing - quadratic probing - double hashing algorithms and their implementations - rehashing - extendable hashing - separate chaining - hashing efficiency - heaps - overview of heaps - implementation and operations.

Unit V:

Heap structures - Min-Max heaps - Deaps - leftist heaps - binomial heaps – Fibonacci heaps - binary heaps - skew heaps - pairing heaps - applications - amortized analysis an unrelated puzzle - Binomial queues - skew heaps - Fibonacci heaps - Splay trees.

References:

1. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and Algorithms, Addison-Wesley, ISBN: 978-0201000238.

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3. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, Silicon Press, ISBN: 0929306406.

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8. Thomas H Cormen, Charles E Leiserson, and Ronald L Rivest, Introduction to Algorithms, 3rd Edition, Prentice Hall of India Private Limited, New Delhi, ISBN: 978- 0262033848.

9. Seymour Lipschutz, Data Structures With C, 1st Edition, Tata Mcgraw Hill Education,Private Limited, ISBN: 0070701989.

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CSS1C03 – THEORY OF COMPUTATION

Objectives:

To provide the students with an understanding of basic concepts in the theory of computation.

Course Outcome

CO1: Describe broad overview of the theoretical foundations of computer science.
CO2: Understand regular languages and finite automata.
CO3: Apply the concept of context free languages in problem solving.
CO4: Solve various problems of applying normal form techniques, push down automata and Turing Machines.
CO5: Propose solutions for the problems based on computability and decidability.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	4	1	1	3	3	2	3	3	3	3
CO2	3	3	3	1	3	2	4	4	3	2
CO3	3	3	3	3	3	3	3	3	4	2
CO4	2	3	2	4	2	3	3	3	3	3
CO5	3	3	3	4	4	2	3	3	3	3

Course Outline

Unit I:

Preliminaries - Introduction to formal proof and inductive proofs - The central concepts of Automata Theory - Alphabets, Strings. Languages - Introduction to automata and grammar - Deterministic Finite Automata, Non-deterministic Finite Automata - Equivalence of Deterministic and Nondeterministic Finite Automata - Finite Automata with Epsilon Transitions - Equivalence of NFA with and without epsilon moves.

Unit II:

Regular Expressions, Finite Automata and Regular Expressions, Properties of Regular Languages - Pumping lemma and proof for existence of non-regular languages, Closure properties, homomorphism, substitution - Decision Properties - Equivalence and Myhill Nerode and DFA state minimization - Regular Grammar.

Unit III:

Context Free Languages - Equivalence of CFG and PDA - Normal forms (CNF and GNF) - Closure properties of CFL's - DCFL's and their properties - Decision procedures –CYK algorithm - Pumping lemma and proof for existence of non-context - free languages- Context sensitive languages: Equivalence of LBA and Context Sensitive Grammar (CSG).

Unit IV:

Turing machines - TM computations - Equivalence of standard TM with multi tape and non deterministic TM's - Turing acceptable, Turing decidable and Turing enumerable language classes - Equivalence of type 0 grammars with TM's - Church thesis – Chomsky hierarchy - Closure properties of recursive and recursively enumerable languages.

Unit V:

Computability and Decidability - halting problem - reductions – post correspondence problem. Computational complexity - Time and space bounded simulationsClasses P and NP - NP completeness - Cook's theorem.

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CSS1C04 – THE ART OF PROGRAMMING METHODOLOGY

Objectives:

▪ To learn the art of designing algorithms and flowcharts.

▪ To introduce the concept of an algorithmic approach for solving real-life problems.

▪ To develop competencies for the design and coding of computer programs.

▪ To learn designing programs with advanced features of C.

Course Outcome

CO1: Improve ability to develop effective algorithms.
CO2: Understand the fundamental principles of problem-solving using computers.

CO3. Demonstrate the applications of the programming constructs including decision making, looping, arrays and strings and Conceptualize modular programming basics using functions, structures and Unions.

CO4. Understand features like pointers and macros and to become familiar with programming with files

CO5: Design, develop, implement, test and document well-structured and reliable computer programs using the C programming language.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	3	3	3	3	3	3
CO2	3	3	1	3	3	3	3	3	3	3
CO3	3	3	1	3	3	3	3	3	3	3
CO4	3	3	1	3	3	3	3	3	3	3
CO5	3	3	1	3	3	3	3	3	3	3

Course Outline

Unit I:

Part A: Problem Solving - Flow Chart for Structured Programming - Program Charts System Charts - Variables, data names, programming statements - Flow Chart Symbols - Terminal Symbols - I/O - Comments - Connectors - Process - Decision - Loops- Flow Charts of Fundamental Algorithms (mentioned in Part B). Part B: Algorithm Design - Problem Solving Aspect - Top down Design - Formal Conventions Writing Algorithms – Fundamental Algorithms (Discuss the Design of Algorithms only). Part C: Program, Characteristics of a good program - Modular Approach - Programming style - Documentation and Program Maintenance - Compilers and Interpreters -

Running and Debugging Programs - Syntax Errors - Run-Time Errors - Logical Errors - Concept of Structured Programming.

Unit II:

Introduction to C Programming - overview and importance of C - C Program Structure and Simple programs - Creation and Compilation of C Programs under Linux and Windows Platforms. Elements of C Language and Program constructs - structure of C program – character set, tokens, keywords, identifier - Data types, constants, symbolic constants, variables, declaration, data input and output, assignment statements. Operators in C - arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, precedence of operators – arithmetic expressions - evaluation of expressions, type conversion in expressions - precedence and associativity - mathematical functions - I/O operations.

Unit III:

Decision making - if statement, if else statement, nesting of if else and else if ladder, switch statement, break statement, continue statement, goto statement, return statement. Looping - while, do-while, and for loops, nesting of loops, skipping & breaking loops. Arrays – single dimension arrays - accessing array elements - initializing an array, two dimensional & multidimensional arrays - memory representation - strings - processing of strings – string manipulation functions.

Unit IV:

The Concept of modularization - defining function - types of functions - User defined functions - function prototype and definition - arguments - passing parameters - call by reference - call by value - returning - nesting of functions and recursion - passing arrays & strings to function - returning multiple values - recursion - scope and life time of variables storage class specifiers - automatic, extern, static storage, register storage. Structures & Union definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit-fields.

Unit V:

Pointer - pointer operator - pointer expression - declaration of pointer – initializing pointer - de-referencing - pointer to pointer, constant pointer, array of pointers, pointer to function. Files - file handling - defining & opening a file - closing a file - Input/output operations on files - error handling, random access to files, command line arguments - dynamic memory allocation - linked lists (concepts only) - preprocessor directives: macro substitution directives - simple macros - macros with arguments - nesting of macros, compiler control directives.

References:

1. Martin M. Lipschutz and Seymour Lipschutz, Schaum's Outline of Theory and Problems of Data Processing, ISBN: 9780070379831 (Unit I Part A).

2. Anil Bikas Chaudhuri, The Art Of Programming Through Flowcharts & Algorithms, Laxmi Publications, New Delhi (Unit I Part A).

3. Jean Paul Trembley and Pual G Sorenson, An Introduction to Data Structures with Applications, Tata McGraw Hill (Unit I Part B).

4. R G Dromey, How to Solve by Computer, Pearson Education, 5th Edition, ISBN: 0134340019 (Unit I Part B).

5. J.B Dixit, Computer Fundamentals and Programming in C, Firewall Media, ISBN: 8170088828. (Unit I Part C).

6. Dennie Van Tassel, Program Style, Design, Efficiency, Debugging, and Testing, PHI, ISBN: 0137299478 (Unit I Part C).

7. E Balagruswamy, Programming in ANSI C, TMH, 5th Edition, ISBN: 0070681821.

8. Kamthane, Programming in C, 2nd Edition, Pearson India, ISBN: 8131760316.

9. Brian W. Kernighan and Dennis M. Ritchie, C Programming Language, PHI, ISBN: 0131103628.

10. Kanetkar, Let Us C, BPB Publications, 8th Edition, ISBN: 1934015253.

CSS1C05 – COMPUTER ORGANIZATION & ARCHITECTURE

Objectives: To familiarize with the digital fundamentals, computer organization, computer architecture and assembly language programming.

Course Outcome

CO1: Identify, understand and apply different number systems and codes and identify the digital representation of data in a computer system.
CO2: Understand the general concepts in digital logic design and their use in sequential and combinational circuit design.
CO3: Describe fundamental organization of a computer system and computer arithmetic formulae and solve problems .
CO4: Explain addressing modes, instruction formats and program control statements.

CO5: Distinguish the organization of various parts of a system memory hierarchy Identify and compare different methods for computer I/O.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	0	3	3	3	3	3	0	3
CO2	3	1	0	3	3	3	3	3	0	3
CO3	3	1	0	3	3	3	3	3	0	3
CO4	3	1	0	3	3	3	3	3	0	3
CO5	3	1	0	3	3	3	3	3	0	3

Course Outline

Unit I:

Number systems and Conversions, Boolean Algebra - Truth Tables - Logic gates and Map simplification - flip-flops - design of combinational and sequential circuits - examples of digital circuits - adders, multiplexers, decoders, counters, shift registers - register transfer language and micro operations - data representation - data types, sign and magnitude, complements, fixed-point representation, floating-point representation, other binary codes, error detection codes.

Unit II:

Basic computer organization - machine instructions - classification, function, addresses, size, addressing modes - instruction cycle - instruction sequencing. Fundamental concepts - registers, register transfers, performing arithmetic or logic operations, memory read and write, execution of a complete instruction, branch instruction, single bus, two bus, three bus organization, a complete processor - Control unit - hardwired control, micro programmed control, micro instructions-types.

Unit III:

Arithmetic & Logic Unit - addition of positive numbers - fast adders - signed addition and subtraction - addition/subtraction logic unit - multiplication of positive numbers – array multiplier, sequential multiplier - signed number multiplication - multiplication using Booth's algorithm - fast multiplication - bit pair recording of multiplication, division-restoring and nonrestoring algorithms, floating point numbers and operations.

Unit IV:

Main Memory - memory hierarchy - main memory - RAM, ROM - memory cells-cell organization - working - performance considerations - cache memory - virtual memory- memory management requirements - secondary storage - memory interleaving. Input / Output Organization - Accessing I/O ,devices - programmed I/O, interrupt I/O - interrupts – interrupt processing - hardware interrupts - programmable interrupt controller - vectored interrupts - interrupt nesting - daisy chaining - direct memory access (DMA) - DMA operations & DMA Controller, Introduction to I/O interfaces, I/O channels, IO Processors.

Unit V:

Architecture - General 8-bit microprocessor and its architecture - 8085 – Functional block diagram - architecture functions of different sections - architecture of 8086 CPU. Instruction Sets - Instruction format - addressing modes - instruction set of 8085 CPU - Instruction cycle - timing diagrams - different machine cycles - fetch and execute operations - estimation of execution time - estimation of execution time. Intel 8051 Micro controller - Architecture - basic instructions - basic assembly language programs peripherals: interrupts, timers, parallel port, serial port.

References:

1. V Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Computer Organization, McGraw Hill International Edition, 5th Edition, ISBN: 9780071122184.

2. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India, ISBN: 0876924178.

3. M Morris Mano, Computer System Architecture, Prentice Hall, 3rd Edition. ISBN: 0131755633.

4. William Stallings, Computer Organization and Architecture, 9th Edition, Prentice Hall, ISBN: 013293633X.

5. Andrew S Tanenbaum, Structured Computer Organization, Prentice Hall, 6th Edition, ISBN: 0132916525.

6. Floyd Thomas L, Digital Fundamentals, Pearson Education, 10th Edition, Prentice Hall, ISBN: 0132359235.

7. Albert Paul Malvino, Donald P Leach, Digital Principles and Applications, McGraw Hill, 4th Edition, ISBN: 0070398836.

8. Thomas C Bartee, Digital Computer Fundamentals, McGraw Hill, 6th Edition, ASIN: B004H0SL5K.

9. Ramesh. S. Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, 6th Edition, Wiley Eastern Ltd, New Delhi, ISBN: 9788187972884.

10. Mohamed Rafiquzzaman, Introduction to Microprocessors and Microcomputer Based System Design, 2nd Edition, CRC Press, ISBN: 9780849344756.

11. Muhammad Ali Mazidi, Janice Mazidi, Rolin Mckinlay, Janice M. Mazidi, Janice Gillispie Mazidi and Rolin D., The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, 5th Indian Reprint, ISBN: 013119402X.

CSS1L01 – PRACTICAL I

Objectives: To practically implement the theory portions covered in The Art of Programming

 Methodology (CSS1C04) and Advanced Data Structures (CSS1C02).

Course Outcome

CO1: Develop programming skills using the fundamentals and basics of C language.

CO2: Develop programs using the basic elements like control statements, arrays and strings.

CO3: Design and implement the effective usage of arrays, structures, functions and pointers.

CO4: Implement files handling and command line arguments.

CO5: Demonstrate the concepts of stack, queue and linked list and apply various operations on

 them.

CO6: Demonstrate the concept of tree traversal and its operations.

CO7: Design program based on the concepts of sorting and searching techniques.

Course Outline

Unit I: C Programming

1. Simple C Programs like area of a circle, checking whether a given number is odd or even.

2. Implementation of programs using Loops (pyramid printing, factorial computation, number reversing, checking for Armstrong numbers, finding first N or Nth Prime numbers etc).

3. Use of 1D and 2D Arrays (searching, sorting and vector operations, matrix addition, matrix multiplication).

4. String Manipulations.

5. Structures and Unions (like addition of two complex numbers, student record creation and manipulation etc).

6. Writing functions.

7. Implementation of recursion (recursive function to compute a factorial, reverse string

etc).

8. Command line arguments.

9. Pointers - simple programs to learn concept of pointers, array operation using pointers etc.

10. File operations – file and structures.

Unit 2: Data Structures and Algorithms

1. Implementation of stacks using arrays.

2. Implementation of queues, circular queue using arrays.

3. Implementation of sequential search and binary search techniques.

4. Implementation of linked lists and operations (add, insert, delete, search) on linked lists.

5. Implementation of stacks using linked list.

6. Implementation of queues using linked list.

7. Implementation of doubly linked list.

8. Implementation of circular linked list.

9. Implementation of binary tree and traversals.

10. Implementation of Binary search trees and perform the operations on BST.

11. Implementation of various sorting algorithms.

12. Conversion of an infix expression to the postfix form using stacks.

13. Evaluation of a postfix expression.

14. Implementation of graphs and graph traversals.

15. Implementation of heap tree and operations.

CSS1A01 – INTRODUCTION TO RESEARCH (ABILITY ENHANCEMENT AUDIT COURSE)

Objectives:

Large numbers of students are actively considering and taking up research and associated higher studies. An introductory course on research aims to introduce students to the important aspects of research. The intent of such a course is to make students aware of the details associated with formal research. By going through this introductory course on research, students are likely to be able to take up research activities in a more systematic and formal manner right from the beginning.

Course Outcome

CO1: Understand research terminology.
CO2: Apply the ethical principles of research.
CO3: Identify the components of a literature review process.
CO4: Critically analyze published research works.
CO5: Innovate and apply research methods in the discipline of computing.

Course Evaluation & Course Credit

The Ability Enhancement Audit Course has 4 credits which will not be counted for evaluating the overall SGPA & CGPA. The College/Department shall conduct examination of 2 Hrs duration with a minimum of 20 weightage before the conclusion of first semester classes and have to intimate /upload the results of the same to the University on the stipulated date during the III Semester. Students have to obtain only minimum pass requirements in this Audit Course.

Course Delivery Mode

This course is an Ability Enhancement Audit Course. The course content is not delivered in the classrooms. Instead, the students have enrol themselves for the online course offered at NPTEL. The online course is available at https://nptel.ac.in/courses/121106007/. Students can either view the video module online or can download the video lessons and transcripts to view or read them offline.

Course Outline

The students are encouraged to cover the following modules of the course Introduction to Research from NPTEL:

▪ Week1: Overview of Research

▪ Week2: Overview of Literature Survey: Literature Survey using Web of Science, Literature Survey using Scopus, Writing Up, Tutorial on using BibTeX with LaTeX to add references to a document, Tutorial on using Microsoft Word with Bibliographic Sources, Tutorial on using Microsoft Word with endnote entries

▪ Week3: Data Analysis

▪ Week4: How to make Technical presentation – Technical Writing

▪ Week 6: Intellectual property

▪ Week8: Research in Computer Science & Engineering

References:

1. Video Lessons and Transcripts available (including in the regional language) at https://nptel.ac.in/courses/nptel_download.php?subjectid=121106007.

SEMESTER II

CSS2C06 – DESIGN AND ANALYSIS OF ALGORITHMS

Objectives:

▪ To introduce the concept of an algorithmic approach for solving real-life problems.

▪ To teach basic principles and techniques of computational complexity.

▪ To familiarize with parallel algorithms and related techniques.

Course Outcome

CO1: Design algorithms in context of space and time complexity and apply asymptotic notation.
CO2: Analyze the problem and develop the algorithms related to these problems.
CO3: Classify the problems and apply the appropriate design strategy to develop algorithms. CO4: Analyze the problem and develop the algorithms related to these problems.
CO4: Analyze the problem and develop the algorithms related to these problems.
CO5: Demonstrate the use of parallel algorithms.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	3	2	0	3	0	3	3	3	3	3
CO2	3	2	0	3	0	3	3	3	3	3
CO3	3	2	0	3	0	3	3	3	3	3
CO4	3	2	0	3	0	3	3	3	3	3
CO5	3	2	0	3	0	3	3	3	3	3

Course Outline

Unit I: Algorithm Design: Introduction, Steps in developing algorithm, Methods of specifying an algorithm, Decisions prior to designing: based on the capabilities of the device, based on the nature of solutions, based on the most suitable data structures. Model of Computation: RAM model and PRAM model. Important Problem Types (Introductory concepts): Sorting, Searching, String processing, Graph problems, Combinatorial problems, Geometric problems and Numerical problems.

Unit II: Basic Technique for Design of Efficient Algorithm: Brute Force approach (String matching), Divide-and-Conquer approach (Merge sort), Branch-and-Bound technique (Knapsack problem). Greedy approach (Kruskal's algorithm and Prim's Algorithm), Dynamic Programming (Longest Common Subsequence), Backtracking (Sum of subsets problem).

Unit III: Algorithm Analysis: Importance of algorithm analysis, Time and Space Complexity. Growth of Functions: Asymptotic notations, Cost estimation based on key operations- Big Oh, Big Omega, Little Oh, Little Omega and Theta notations, Big Oh Ratio Theorem, Big Theta Ratio Theorem, Big Omega Ratio Theorem. Analyzing Algorithm Control Structures, Solving Recurrences: Iteration Method, Substitution Method, The Recursion Tree Method, Master's Theorem, Problem solving using Master's Theorem Case 1, Case 2 and Case 3. Analysis of Strasser's algorithm for matrix multiplication, Analysis of Merge sort.

Unit IV: Complexity - Complexity Classes: P, NP, NP Hard and NP Complete problems. NP Completeness reductions for Travelling Salesman Problem and Hamiltonian Cycle. P versus NP problem.

Unit V: Analysing Parallel Algorithms: Time Complexity, Cost, Number of Processors, Space Complexity, Speed up, Efficiency, Scalability, Amdahl's Law. Parallel merging and sorting, Euler tour technique, Parallel prefix computation, Deterministic symmetry breaking.

References:

1. Thomas H Cormen, Charles E Leiserson, and Ronald L Rivest, Introduction to Algorithms, 3rd Edition, Prentice Hall of India Private Limited, New Delhi, ISBN: 9780262033848 (Unit I, II, III and IV).

2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, The Design and Analysis of Computer Algorithms, 1st Edition. Addison Wesley, ISBN: 0534915728 (Unit I, II, III and IV).

3. Pallaw, V K, Design and Analysis of Algorithms, Asian Books Private Ltd, 2012, ISBN: 8184121687 (Unit I, II, III and IV).

4. Sanjay Razdan, Fundamentals of Parallel Computing, Narosa Publishing House, 2014, ISBN: 9788184873481 (Unit V).

5. Pandey H M, Design and Analysis of Algorithms, University Science Press, 2013, ISBN: 9788131803349 (Unit I, II, III and IV).

6. Upadhyay N, Design and Analysis of Algorithms, SK Kataria & Sons, 2008 (Unit I, II, III and IV).

7. U. Manber, Introduction to Algorithms: A Creative Approach, Addison Wesley, ISBN: 9780201003277 (Unit I, II, III and IV).

8. Gilles Brassard and Paul Bratley, Fundamentals of Algorithmics, Prentice-Hall of India, ISBN: 0133350681 (Unit I, II, III and IV).

9. Goodman S E and Hedetniemi, Introduction to the Design and Analysis of Algorithms, Mcgraw Hill, ISBN: 0070237530 (Unit I, II, III and IV).

10. Horowitz E and Sahni S, Fundamentals of Computer Algorithms, Galgotia Publications Pvt. Ltd, ISBN: 8175152575 (Unit I, II, III and IV).

11. Oded Goldreich, P, NP and NP - Completeness, Cambridge University Press, 2011. ISBN: 0521122546 (Unit V).

12. Donald Knuth, The Art of Computer Programming, Fundamental Algorithms, Volume 1, Addison Wesley, 1997, ISBN: 8177587544 (Unit I).

13. Sanjeev Arora and Boaz Borak, Computational Complexity - A Modern Approach, Cambridge University Press; 2009, ISBN: 0521424267 (Unit III).

14. Daniel Hills W and Bruce M Boghosian, Parallel Scientific Computation, Science, 13 August 1993, Vol. 261 (5123), pp.856-863 (Unit V).

CSS2C07 – OPERATING SYSTEM CONCEPTS COURSE

Course Outcome

CO1: Understand the basic components of a computer operating system and interpret the applications of Process and threads. .

CO2: Describe the policies for scheduling, deadlocks, synchronization, system calls, and file systems.
CO3: Illustrate the functioning of process management, memory management and file management Modules present in an OS.
CO4: Differentiate various types of scheduling algorithms.
CO5: Understand the concepts of Three-Tier Client/Server Architecture, Middleware and the characteristics of mobile operating systems.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	0	0	3	0	3	3	3	0	1
CO2	1	3	0	3	0	3	3	3	0	2
CO3	2	3	0	3	0	3	3	3	0	2
CO4	3	3	0	3	0	3	3	3	0	3
CO5	1	3	0	3	0	3	3	3	0	3

Course Outline:

Unit I: Operating System Overview - Objectives and functions - Evolution of Operating System - Major Achievements - Process Description and Control - Process, Creation & Termination of Processes, Five State Model, Suspended Process, Process Description, Process Control - Modes of Execution, Process Creation, Process and Mode Switching. Threads - Processes Vs Threads, Multithreading, Thread States, Types of Threads, Multi Core and Multithreading. Case Study - Unix SVR4 Process Management, Linux Process and Thread Management.

Unit II: Concurrency - Principles, Race Condition, Operating System Concerns, Process Interaction, Completion for Resources, Cooperation by Sharing. Mutual Exclusion - Requirements, Hardware Support, Semaphores, Producer Consumer Problem, Monitors, Message

Passing, Readers/Writers Problem. Deadlock - Principles, Prevention, Avoidance, Detection, Recovery, Dining Philosophers Problem. Case Study: Unix Concurrency Mechanisms.

Unit III: Memory Management, Address binding, Logical Vs Physical address space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand paging, Page replacement, Thrashing. Case Study: Windows Memory Management.

Unit IV: Uniprocessor Scheduling - types, scheduling algorithms - criteria, nonpreemptive, preemptive. Comparative study of scheduling algorithms - FCFS, SJF, Priority, RR, Multilevel, Feedback Queue. Multiprocessor Scheduling - Classification, Granularity, Design Issues, Process Scheduling, Thread Scheduling. Real Time Scheduling - Background, Characteristics of Real Time OS, Scheduling, Deadline Scheduling, Rate Monotonic Scheduling, Priority Inversion. Case study: Linux Scheduling.

Unit V: Client/Server Computing - Definition, Applications, Classes, Three-Tier Client/Server Architecture, Middleware. Service-Oriented Architecture- Distributed Message Passing - Remote Procedure Calls - Clusters. Mobile Operating Systems - Characteristics - Comparative Study of the Features of iOS and Android.

References

1. William Stallings, Operating System- Internals and Design Principles, 7th Edition, Pearson, ISBN: 9780273751502.

2. Abraham Silberschatz, Peter B. Galvin and, Greg Gagne, Operating System Concepts, 9th Edition, John Wiley & SonsTISBN: 9781118063330.

3. Ann Mclver McHoes and Ida M. Flynn, Understanding Operating Systems, 6th Edition, Cengage Learning, 2010, ISBN: 9781439079201.

4. Mukesh Singhal and Niranjan G. Shivaratri, Advanced Concepts in Operating Systems - Distributed, Database, and Multiprocessor Operating Systems, Tata McGrawHill Education Private Limited, ISBN: 9780070575721.

5. Current Literature (for Mobile Operating Systems).

CSS2C08 – COMPUTER NETWORKS

Objectives:

▪ To provide the student with a top-down approach of networking starting from the application layer.

▪ To introduce computer networking in the backdrop of Internet protocol stack.

Course Outcome

CO1: Understand the basic concepts of computer network organization and implementation.

CO2: Describe theoretical understanding of layered network models - OSI and TCP/IP Models.

CO3: Illustrate the functionalities of different network layers.

CO4: Analyze the network application such as data transmission between client and server, file transfer, real-time and multimedia transmission.

CO5: Explain the security aspects in networks and principles of cryptography.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	0	0	3	3	1	0	2	0	1
CO2	1	0	0	3	3	3	2	1	1	2
CO3	2	0	0	3	3	3	3	3	3	3
CO4	3	0	0	3	3	3	3	3	3	3
CO5	3	0	0	3	3	3	3	3	3	3

Course Outline:

Unit I: Introduction to Computer networks - introduction - topology - categories of networks Internetwork - Internet - network modes- layered model - OSI and TCP/IP Models, Transmission media - Wired and unwired media. Computer networks and Internet - the network edge - the network core - network access - delay and loss - protocol layers and services - history of computer networking and Internet.

Unit II: Application layer protocols – principles – the web and HTTP – FTP – Email in Internet – DNS. Socket programming – building a Web server - content distribution.

Unit III: Transport layer services – introduction – relationship between Transport and Network layer – UDP – reliable data transfer – TCP - congestion control - Network layer services – routing – IP - routing in Internet - router - IPV6 - multicast routing – mobility.

Unit IV: Link layer services - error detection and correction - multiple access protocols – LAN address – ARP – Ethernet – hubs – bridges – switches - wireless links – PPP - ATM.

Unit V: Security in Networks – Principles of Cryptography – Authentication – Integrity –Key Distribution and Certification – Firewalls – Attacks and Counter Measures.

References:

1. J. F. Kurose and K. W. Ross, Computer Networking: A Top-Down Approach Featuring Internet, 6th Edition, Perason Education, ISBN: 0132856204.

2. Behrouz Forouzan, Data Communications and Networking, 4th Edition, McGraw- Hill Reprint, ISBN: 0073250325.

3. Peterson L.L. and Davie B .S., Computer Networks, A Systems Approach, 5th Edition, Morgan Kaufmann, ISBN: 9780123850591.

4. Keshav, An Engineering Approach to Computer Networking, Pearson Education Asia, ISBN: 97898123598652000.

5. Andrew S. Tanenbaum, Computer Networks, 5th Edition, PHI, ISBN: 9788131787571.

6. Herbert Scheldt, Java Complete Reference, 7th Edition, McGraw-Hill Osborne Media, ISBN: 9780072263855.

CSS2C09 – COMPUTATIONAL INTELLIGENCE

Objectives:

To introduce concepts of Artificial Intelligence and Machine Learning.

Course Outcome:

CO1: Apply the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems.
CO2: Conceptualize various knowledge representation techniques.
CO3: Analyze the problem-solving methods and algorithms related to searching, reasoning, game playing and machine learning.
CO4: Understand the functioning of expert systems and its importance.

CO5: Demonstrate the implementation of various AI algorithms to solve real life problems. Course Outline

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO↓										
CO1	3	2	4	4	3	3	3	3	3	3
CO2	3	2	3	4	3	3	3	3	3	3
CO3	2	2	3	4	3	3	3	3	3	3
CO4	3	2	3	4	3	3	3	3	3	3
CO5	3	2	3	4	3	3	3	3	3	3

Unit I: Introduction - Artificial Intelligence - problems, scope and applications, problem space and search - production system- characteristics - the predicate calculus, inference rules, structures and strategies for state space search, strategies for space search, using state space to represent reasoning with the predicate calculus.

Unit II: Heuristics Search: control and implementation of state space search, generate and test, hill climbing, Best-first search, problem reduction, constraint satisfaction, means- ends analysis, heuristic in games, complexity issues.

Unit III: Knowledge representation issues, representation and mappings, representing simple facts in logic, representing instances and ISA relationships, computable functions and predicates, resolution, natural deduction, knowledge representation using rules, logic programming, forward versus backward reasoning, symbolic reasoning under uncertainty- nonmonotonic reasoning, depth first search, breadth first search.

Unit IV: Game playing - the mini-max search procedure, adding alpha-beta cut-offs, additional refinement, iterative deepening, planning system and its components, understanding, understanding as constrained satisfaction. Slot and filler structures: semantic nets, frames, conceptual dependency, scripts. Definition and characteristics of expert system, representing and

using domain knowledge, expert system shells. Knowledge engineering, knowledge acquisition, expert system life cycle & expert system tools, MYCIN & DENDRAL examples of expert system.

Unit V: Machine learning - rote learning, learning by taking advice, learning in problem solving, learning from examples, explanation-based learning, analogy, formal learning theory, connectionist models - hopfield networks, learning in neural networks, back propagation, the genetic algorithm, classifier systems and genetic programming, artificial life and society-based learning.

References:

1. Elaine Rich, Kevin Knight and Shivshankar B. Nair, Artificial Intelligence, 3rd Edition, Tata - McGraw Hill, New Delhi, ISBN: 0070087709.

2. V S Janakiraman, K Sarukesi and P Gopalakrishnan, Foundations of Artificial Intelligence and Expert System, Macmillan India Limited, ISBN: 0333926250.

3. Stuart Russell and Peter Norvg, Artificial Intelligence: A Modern Approach, 3rd Edition, Prentice Hall, ISBN: 0136042597.'

4.. G. F. Luger and W.A Stubblefield, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, Addison-Wesley, 6th Edition, ISBN: 9780321545893.

5. P. H. Winston, Artificial Intelligence, Addison-Wesley, 3rd Edition, ISBN: 0201533774.

6. Nils J. Nilsson, Artificial Intelligence, A New Synthesis, 1st Edition, Morgan Kaufmann Publishers, Inc, ISBN: 1558604677.

CSS2C10 – PRINCIPLES OF SOFTWARE ENGINEERING

Objectives:

▪ To develop familiarity with software engineering principles and practices.

▪ To have an understanding about the process of product/literature survey, techniques of problem definition, and methods of report writing.

Course Outcome

CO1: Understand the software process and development models.
CO2: Understand the software design process and structured analysis of systems.
CO3: Distinguish different types of modelling like DFD and UML.

CO4: Illustrate the knowledge about the design of user interface.

CO5: Apply the skill of project management and report preparation.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	3	3	3	3	3	3	3
CO2	3	1	2	3	3	3	3	3	3	3
CO3	3	1	1	3	3	3	3	3	3	3
CO4	3	1	2	3	3	3	3	3	3	3
CO5	3	1	2	3	3	3	3	3	3	3

Course Outline:

Unit I: Introduction – problem domain - software engineering challenges – approaches– software process and development models – agile models – SDLC - software process.

Unit II: Software requirements analysis & specification - feasibility study - types of feasibility – software requirements - problem analysis – requirement specification – functional specification – metrics. Software design – outcome – cohesion and coupling – layered arrangement of modules – approaches to software design - structured analysis – DFD – extending DFD technique for applying to real-time systems – structured design – detailed design - object oriented modelling – use case model – class diagram – interaction diagram - activity diagram - data diagram – state chart diagram - ER diagram.

Unit III: User Interface (UI) design – characteristics – basic concepts – types – fundamentals of component-based GUI Development – UI design methodology – process planning – cost estimation – project scheduling – configuration management – risk management - software coding – review – documentation – software testing - software testing basics - steps involved in test plan - software testing strategies.

Unit IV: Managing project – time management – setting aims and objectives – techniques for generating ideas – literature survey – types of information sources – writing literature survey.

Unit V: Project story preparation – key deliverables – communicating with experts – forms of communication – presenting ideas – common problems faced by a research scholar – report writing.

References:

1. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, ISBN: 9788173197024.

2. Rajib Mall, Fundamentals of Software Engineering, 3rd Edition, PHI Learning Pvt Ltd, ISBN: 9788120338197.

3. Rohit Khurana, Software Engineering: Principles and Practices, 2nd Edition, Vikas Publishing House Pvt Ltd, ISBN: 8125939466.

4. Andy Hunt, Your Research Hunt, How to Manage it, Routledge, ISBN: 0415344085.

5. Michael Jay Polonsky, David S. Waller, Designing and Managing a Research Project: A Business Student's Guide, Sage, ISBN: 1412977754.

6. Richard Bullock, Maureen Daly Goggin and Francine Weinberg, The Norton Field Guide to Writing (with Readings and Handbook), 3rd Edition, W. W. Norton & Company, ISBN: 0393919595.

7. Kavadia Garg, Agrawal and Agrawal, An introduction to Research Methodology, Rbsa Publishers ISBN: 8176111651.

CSS2L02 – PRACTICAL II

Objectives:

To practically implement the theory portions covered in the courses Operating System Concepts (CSS2C07) and Computer Networks (CSS2C08) and to extend the programming knowledge acquired through course

The Art of Programming Methodology (CSS1C04).

Course Outcome

CO1: Discuss and formulate the problems based on the basic principles of networks.

CO2: Implementation of different memory management techniques in OS.

CO3: Implement various system operations of the operating system and also the various process scheduling algorithms.

CO4: Understand the TCP/IP configuration for Windows and Linux.

CO5: Design and implement various network applications such as data transmission between client and server, file transfer, real-time multimedia transmission.

CO6: Understand different Linux/UNIX shell scripts and execute various shell programs.

Course Outline

Unit I: Computer Networks

1. Design a LAN with a given set of requirements. The design should include topology, hardware and software requirements like cable, connectors, hubs/switches/bridges, interface cards along with a budget for the LAN. (Faculty in charge should give the requirements to the students)*.

2. Establish a LAN that consists of at least one server and two clients*.

3. Study of network utilities in Linux/Windows (hostname, ping, ifconfig, ipconfig, netstat, nslookup, telnet, traceroute, finger, telnet, tracert, arp, ftp etc)*.

4. Implementation of TCP Client.

5. Implementation of TCP Server.

6. Write a program to check the Date and Time in TCP Date Time Client.

7. Write a program to check the Date and Time in TCP Date Time Server.

8. Implementation of UDP client and server.

9. Write a program to transfer Files using UDP.

10. Implementation of transferring files using FTP.

11. Write a program to simulate the sliding window protocol.

12. Study of Network Simulators (NS2/Glomosim)*.

Unit II: Operating System Concepts

1. Write programs using the following system calls: fork(), execl() and wait().

2. Write File System Calls to write, append and display.

3. To accept the burst time for a set of processes for FCFS scheduling and create chart consisting of the burst time, turnaround time and wait time of each process.

4. To accept the burst time for a set of processes for SJF scheduling and create chart consisting of the burst time, turnaround time and wait time of each process.

5. To accept the burst time and priority for a set of processes for Priority scheduling and create chart consisting of the burst time, priority, turnaround time and wait time of each process.

6. To create n Fibonacci numbers and prepare a list of prime numbers amongst them (use pipe for IPC).

7. To demonstrate IPC using shared memory.

8. To allocate memory requirements for processes using best fit allocation- Accept n processes with their memory requirements and n holes with their sizes. Perform memory allocation using Best Fit algorithm. Display a chart consisting of the process and the allocated hole.

9. To accept n processes with their memory requirements and n holes with their sizes. Perform memory allocation using First Fit algorithm. Display a chart consisting of the process and the allocated hole.

10. To demonstrate the process of contiguous allocation of memory blocks to store files of varying sizes.

11. To implement Producer Consumer problem using semaphores.

CSS2A02 – TERM PAPER (PROFESSIONAL COMPETENCY AUDIT COURSE)

Objectives:

▪ To introduce the student to the techniques of literature survey.

▪ To acquaint him/her with the process of presenting his/her work through seminars and technical reports.

Course Outcome:

CO1: Apply critical thinking skills analytical ability in problem solving.
CO2: Apply foundational research skills to address research problem.
CO3: Innovate, experiment and analyze research findings.
CO4: Demonstrate capacity to lead and manage change through a collaborative environment.
CO5: Innovate, experiment and analyze research findings and practice the process of scientific publishing.

Course Outline

The student is expected to do an extensive literature survey and analysis in an area related to computer science, chosen by him/her, under the supervision of a faculty member from the department. The student has to choose an area for his/her work after due consultation and approval from the guide. The study should preferably result in a critical review of the present works/design

ideas/designs/algorithms/theoretical contributions in the form of theorems and proofs/new methods of proof/new techniques or heuristics with analytical studies/implementations and analysis of results. The student should give a seminar on his/her work, during the semester, and submit a technical report. Technical report should be prepared in TEX in IEEE conference style format. Course Delivery Mode Students are given choice to opt for the supervisor according to his/her area of interest. The Department Council will finally decide and distribute the students among the faculty members by accommodating the choice and interest of the students, as far as possible. The faculty in charge must give proper directions and guidance to the students in carrying out the literature review effectively and systematically.

Course Evaluation & Course Credit The Professional Competency Audit Course has 4 credits which will not be counted for evaluating the overall SGPA & CGPA. The Department shall conduct the final evaluation of the course based on the following criteria and have to intimate /upload the results of the same to the University on the stipulated date during the III Semester.

Component	Weightage
Publication of the Review Paper in a UGC Listed, Peer Reviewed or other peer reviewed refereed Journals	20% (Maximum weightage be given to UGC listed Journal and weightage be reduced in other cases)
Presentation in an International/ National/ Regional Conference	20% (Maximum weightage be given to International Conferences with Proceeding having ISBN and weightage be reduced in other cases)
Quality of the Technical Report	40%
Quality and Effectiveness of the Report Presentation	20%

Students have to obtain only minimum pass requirements in this Audit Course.

Reference: Articles from ACM/IEEE/INFLIBNET Journals/Conference Proceedings and/or equivalent documents, standard textbooks and web-based material, approved by the supervisor.

SEMESTER III

CSS3C11 – ADVANCED DATABASE MANAGEMENT SYSTEM

Objectives:

▪ To understand the relational model, and know how to translate requirements captured in an Entity-Relationship diagram into a relational schema.

▪ To reason about dependencies in a relational schema.

▪ To understand normal form schemas, and the decomposition process by which normal forms are obtained.

▪ To familiarize with advanced SQL' statements.

▪ To understand advanced features of database technologies.

Course Outcome

CO1: Explain the basics of database management systems, concepts of relational data model, entity-relationship model, relational database design, relational algebra and calculus.
CO2: Apply the normalization techniques to improve the database design.
CO3: Describe various database manipulation commands in SQL.
CO4: Understand Transaction Processing & Locking using the concept of Concurrency control.
CO5: Conceptualize advanced features of Object-Oriented Database Management Systems and Distributed databases.

PO→ CO ↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	0	3	0	3	3	3	3	0
CO2	3	1	0	3	0	3	3	3	3	0
CO3	3	1	0	3	0	3	3	3	3	0
CO4	3	1	0	3	0	3	3	3	3	0
CO5	3	1	0	3	0	3	3	3	3	0

Course Outline

Unit I: Introduction - purpose of database systems, views of data - data abstraction, instances and schemas, data independence, data models - hierarchical data model, network data model, relational data model, ER d&tg9,mg9lei. Database languages - DDL, DML, transaction management, storage management, database administrator, database users, overall system structure. Relational data model - relational model concepts, keys, integrity constraints - domain constraints, key constraints, entity integrity constraints, referential integrity constraints. ER data model - basic concepts, constraints, keys, design issues, entity relationship diagram, weak entity sets, extended ER features, design of an ER database schema, reduction of an ER schema to tables. Relational algebra and calculus - relational algebra - selection and projection, set operations, renaming, joins, division. Relational calculus - tuple relational calculus, domain relational calculus. Expressive power of algebra and calculus.

Unit II: Relational database design - anomalies in a database - functional dependency - lossless join and dependency- preserving decomposition - normalization - normal forms - first, second and third normal form - Boyce Codd normal form - multivalued, dependency- fourth normal form - join dependency - project join normal form - domain key normal form.

Unit III: Relational database query languages - basics of QBE and SQL. Data definition in SQL data types, creation, insertion, viewing, updation, deletion of tables, modifying the structure of the tables, renaming, dropping of tables. Data constraints - I/O constraints, primary key, foreign key, unique key constraints, ALTER TABLE command database manipulation in SQL - computations done on table data - SELECT command, logical operators, range searching, pattern matching, grouping data from tables in SQL, GROUP BY, HAVING clauses. Joins - joining multiple tables, joining a table to it. DELETE - UPDATE. Views - creation, renaming the column of a view, destroys view. Program with SQL - data types Using SET and SELECT commands, procedural flow, IF, IF /ELSE, WHILE, GOTO, global variables. Security - locks, types of locks, levels of locks. Cursors - working with cursors, error handling, developing stored procedures, CREATE, ALTER and DROP, passing and returning data to stored procedures, using stored procedures within queries, building user defined functions, creating and calling a scalar function, implementing triggers, creating triggers, multiple trigger interaction (Use MySQL as the RDBMS).

Unit IV: Transaction management, concurrency control and query processing - concept, definition and states of transactions, ACID properties - concurrency control, serializability - conflict serializability, view serializability, recoverability-recoverable schedules, non- cascading schedules, strict schedules. Concurrency control schemes - locking- two phase locking, deadlock, granularity, timestamp ordering protocol. Basics of query processing.

Unit V: Object Oriented Database Management Systems (OODBMS) - concepts, need for OODBMS, composite objects, issues in OODBMSs, advantages and disadvantages of OODBMS. Distributed databases - motivation - distributed database concepts, types of distribution, architecture of distributed databases, the design of distributed databases, distributed transactions, commit protocols for distributed databases.

References:

1. Elmasri and Navathe, Fundamentals of Database Systems, 5th Edition, Pearson, ISBN: 9788131758984.

2. Abraham Silbersehatz, Henry F. Korth and S.Sudarshan, Database System Concepts, 6th Edition, Tata McGraw-Hill, ISBN: 0071325220.

3. CJ Date, An Introduction to Database Systems, 8th Edition, Addison Wesley, ISBN: 0321197844.

4. Ramakrishnan and Gehrke, Database Management Systems, 3rd Edition, McGraw - Hill Education, ISBN: 9339213114.

5. Alexis Leon and Mathews Leon, Database Management Systems, 1st Edition, Vikas Publishers, ISBN: 8182092221.

6. Vikram Vaswani, MySQL The complete Reference, 1st Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 0070586845.

7. Joel Murach, Murach's Mysql, Mike Murach & Associates Inc, ISBN: 9350237695.

8. Paul DuBois, MySQL Cookbook, 2nd Edition, O'Reilly Media, ISBN: 8184042809.

CSS3C12 – OBJECT ORIENTED PROGRAMMING CONCEPTS

Objectives:

To learn object-oriented concepts and programming concepts and methodologies and to learn its implementation using Java.

Course Outcome:

CO1: Recall the object-oriented programing concepts and basics of Java.
CO2: Design and implement object-oriented programs including packages and interfaces.
CO3: Explain and handle exceptions and threads.
CO4: Develop interactive programs using applets, AWT and swings.
CO5: Explain the concepts of JDBC, sockets and gives an introduction to Unified Modelling Language (UML).

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5

CO ↓									
CO1	3	1	0	3	3	3	3	3	0	3
CO2	3	1	0	3	3	3	3	2	0	3
CO3	3	1	0	3	3	3	3	2	0	3
CO4	3	1	0	3	3	3	3	3	0	3
CO5	3	1	0	3	3	3	3	3	0	3

Course Outline:

Unit I: Introduction to OOPS - basic principles of object orientation (objects , attributes and methods, encapsulation and information hiding, state retention, object identity, messages, class hierarchy, inheritance, polymorphism, genericity) - introduction to Java -history, versioning, the Java Virtual Machine, byte code, features of Java, language components - primitive data types, comments, keywords, literals, variables scope & declarations, control structures - FOR, IF, WHILE, DO WHILE, SWITCH, BREAK, CONTINUE statements - operators - casts and conversions - arrays.

Unit II: Object - oriented programming – classes - class fundamentals - declaring objects - new operator – methods – parameter passing – constructors - parameterized constructors - this keyword – finalize method. Overloading methods and constructors, access controls, static and final, nested and inner classes. Inheritance - extends, member access and inheritance, super keyword, polymorphism, method overriding, dynamic method dispatch, abstract classes, packages and interfaces.

Unit III: Exceptions, threads & IO in Java - The file and standard streams, stream classes and interfaces, using byte streams and character streams, threads - threads vs. processes, creating threads, runnable interface, thread class, inter thread communication, synchronization. Exceptions - basic of Java exception handling, hierarchy, developing user defined exception classes.

Unit IV: Applets, AWT & Swing - applet class, types of applet, skeleton, applet tag, passing parameters, event handling, delegation event model, event classes, listeners, AWT classes and window fundamentals, frames, working with fonts, graphics and colors, AWT controls, layouts and menus, dialogue boxes. Swings - Japplets, icon, labels, buttons, textbox, combo box, tables and panes.

Unit V: Database and sockets - JDBC - introduction, architecture, drivers, connections, statements, resultset and meta data (Use MySQL as the RDBMS). Sockets: introduction to networking, InetAddress, url, socket, server sockets, datagrams. Introduction to Unified Modelling Language (UML), UML diagrams, class diagrams, object interaction diagrams, state and activity diagrams, component diagrams, deployment diagrams. Introduction to analysis - object oriented system analysis, design and implementations.

References:

1. Herbert Scheldt, Java Complete Reference, 8th Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 1259002462.

2. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 007014169X.

3. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024.

4. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise in a Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 0596101422.

5. Grady Booch, James Rumbaugh and Ivar Jacobson, The Unified Modeling Language User Guide, 2nd Edition, Pearson, ISBN: 8131715825.

CSS3C13 – PRINCIPLES OF COMPILERS

Objectives: To introduce the fundamental concepts and various phases of compiler design.

Course Outcome

CO1: Understand the major phases of compilation, identify tokens of a typical high -level programming language, define regular expressions for tokens, design and implement a lexical analyzer.
CO2: Develop the parsers and experiment with the knowledge of different parsers design without automated tools.
CO3: Construct the intermediate code representations and generation.
CO4: Explain the role of different types of runtime environments and memory organization for implementation of typical programming languages.

CO5: Apply the optimization techniques to have a better code for code generation.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	0	0	3	3	3	3	3	1	3
CO2	2	0	0	3	3	3	3	3	3	3
CO3	3	0	0	3	3	3	3	3	3	3
CO4	3	0	0	3	3	3	3	3	3	3
CO5	3	0	0	3	3	3	3	3	3	3

Course Outline

Unit I: Introduction to compiling - definition of compiler, translator, interpreter, analysis of the source program, the phases of a compiler, compiler construction tools- applications of compiler technology – programming language basics - lexical analysis – role of lexical analyser - input buffering - specification of tokens – recognition of tokens using finite automata - regular expressions and finite automata - from NFA to DFA - Regular Expression to an NFA - Design of a lexical analyser generator.

Unit II: Syntax analysis – role of parser – error handling and recovery – definitions of parsing, top-down parsing and bottom-up parsing - context free grammars – derivations - parse tree – ambiguity – associativity and precedence of operators - writing a grammar – top- down parsing – recursive descent parsing - FIRST and FOLLOW – LL (1) Grammars – recursive predictive parsing - bottom up parsing – reductions – handle pruning – shift reduce parsing - operator precedence parsing, simple LR parsing.

Unit III: Intermediate code generation – DAG – three address code – addresses and instructions – quadruples – triples – Static Simple Assignment form – types and declarations-type expressions - type equivalences – declarations – type checking – rules – type conversion - function and operator overloading – type inference and polymorphic functions – control flow – boolean expressions –

short circuit code – flow-control statements – control-flow translation for boolean expressions – BREAK CONTINUE and GOTO statements.

Unit IV: Run time environments – storage optimization – static Vs dynamic allocation – stack allocation of space - activation trees and records – calling sequences – access to non local data on the stack – data access without nested procedures – issues with nested procedures – heap management – the memory manager – the memory hierarchy – locality in programs – reducing fragmentation - manual deallocation requests.

 Unit V: Code generation – issues in the design of a code generator – the target language – a simple target machine model – the program and instruction costs – address in the target code – static allocation – stack allocation – run-time address for names – basic blocks and flow graphs – representation of flow graphs. Code optimization - the principal sources of optimization – data flow analysis – abstraction – data flow analysis schema – data flow schemas on basic blocks – reaching definitions – live variable analysis – available expressions. Region based analysis – regions – region hierarchies for reducible flow graphs – overview of a region-based analysis.

References:

1. V Aho A, Ravi Sethi, D Ullman J, Compilers Principles, Techniques and Tools, 2nd Edition, Pearson Education Singapore Pte Ltd, ISBN: 8131721019.

2. K. V. N. Sunitha, Compiler Construction, Pearson, ISBN:9789332500297.

3. W Appel and Andrew, Modern Compiler Implementation in C, 1st Edition,Cambridge University Press, ISBN: 817596071X.

4. Allen I Holub, Compiler Design in C, 1st Edition, PHI Learning Pvt Ltd, ISBN: 812030778X.

5. Tremblay and Sorenson, The Theory and Practice of Compiler Writing, 1st Edition, BSP Books Pvt Ltd, ISBN: 8178000776.

6. Torben Ægidius Mogensen, Basics of Compiler Design, Department of Computer Science, University of Copenhagen (Online Edition).

CSS3L03 – PRACTICAL III

Objectives:

To practically implement the theoretical aspects covered in Advanced Database Management System (CSS3C11) and Object-Oriented Programming Concepts (CSS3C12) and to extend the programming knowledge acquired through The Art of Programming Methodology (CSS1C04) to encompass object-oriented techniques.

Course Outcome

CO1: Design and development of relational database systems.

CO2: Understand various advanced queries execution such as relational constraints, joins, set operations, aggregate functions, trigger and views.

CO3: Apply various software to design and build ER Diagrams, UML, Flowchart for related database systems.

CO4: Design and implement database applications on their own.

CO5: Apply JDBC to provide a program level interface for communicating with database using Java programming.

CO6: Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.

CO7: Understand Java programming concepts and utilize Java Graphical User Interface in program writing.

CO8: Design and develop Java programs that solve real-world problems.

Course Outline:

Unit I: Advanced Database Management System

1. Creating database tables and using data types (create table, modify table, drop table).

2. Data Manipulation (adding data with INSERT, modify data with UPDATE, deleting records with DELETE).

3. Implementing the Constraints (NULL and NOT NULL, primary key and foreign key constraint, unique, check and default constraint).

4. Retrieving Data Using SELECT (simple SELECT, WHERE, IN, BETWEEN, ORDERED BY, DISTINCT and GROUP BY).

5. Aggregate Functions (AVG, COUNT, MAX, MIN, SUM).

6. String functions.

7. Date and Time Functions.

8. Use of union, intersection, set difference.

9. Implement Nested Queries & JOIN operation.

10. Performing different operations on a view.

11. Stored Procedure Programming - Simple Procedures - decision making - Loops - Error handlers - Cursors - Functions - Triggers - Calling Stored Procedure from Triggers.

Unit II: Object Oriented Programming Concepts

1. Simple Java programs like computing formulas expressions.

2. Programs involving loops and decisions like generating Fibonacci, prime, strange series.

3. Programs involving arrays.

4. Programs involving class and objects.

5. Illustrate method overloading.

6. Illustrate single level inheritance.

7. Illustrate multiple inheritances using interface.

8. String sorting, pattern matching etc.

9. Illustrate threads and thread priorities.

10. Illustrate the use of Packages.

11. Exception handling (user-defined).

12. Abstract class.

13. Method overriding.

14. Illustrate usage of Applets like moving ball, face etc.

15. Create an AWT application for a simple calculator.

16. Frame application to illustrate the window events.

17. Frame application to illustrate mouse and keyboard event handling.

18. Swing applications.

19. Create a JDBC application to add the details of a student into a table (Use MySQL as the RDBMS).

20. Socket Programming.

CSS3E01a – COMPUTER GRAPHICS

Objectives:

▪ To understand the fundamentals of the modern computer graphics.

▪ To pipeline the mathematics of affine transformations in three dimensions.

▪ To understand the common data structures to represent and manipulate geometry, colour and light representation and manipulation in graphics systems.

▪ To have an exposure to programming in Open GL.

Course Outcome

CO1: Understand the basics of computer graphics, different graphics systems and applications of computer graphics.

CO2: Extract scene with different clipping methods and its transformation to graphics display device.
CO3: Explore projections and visible surface detection techniques for display.
CO4: Explore object representations and surface detection methods.
CO5: Understand techniques and OpenGL programming concepts.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	3	3	3	3	3	3
CO2	3	3	1	3	3	3	3	3	3	3
CO3	3	3	0	3	3	3	3	3	3	3
CO4	3	3	0	3	3	3	3	3	3	3
CO5	3	3	0	3	3	3	3	3	3	3

Course Outline

Unit I: Introduction – Application of computer graphics, Video Display Devices- refresh CRT, raster and random scan display, color CRT, flat panel, LCD, LED, DVST. Raster - Scan Systems-video controller, display processor, Random-Scan Systems.

Unit II: 2D Graphics: Line drawing algorithms – DDA, Bresenham's – Midpoint Circle drawing algorithm –Filling-Scan line polygon fill algorithm, boundary fill algorithm, floodfill algorithm, 2D Transformations-translation, rotation, scaling, shearing and reflection, composite transformations. 2D Viewing –the viewing pipeline, viewing coordinate reference frame, window-to- viewport coordinate transformation. Clipping-point clipping, Cohen Sutherland line clipping, Sutherland Hodgeman polygon clipping, text clipping.

Unit III: 3D Graphics: 3D Transformations- translation, rotation, scaling, shearing and reflection,3D Viewing-viewing pipeline, viewing coordinates, projections- parallel & perspective projections.

Unit IV: 3D object representation - wireframe model, curve representation, surfaces, spline representation, bezier curves, cubic spline. Visible surface detection methods- classification, back-face detection, Z-buffer algorithm.

Unit V: Discrete Techniques and OpenGL programming - Texture mapping, Bit and Pixel operations, Compositing, Sampling and Aliasing Techniques. Introduction to OpenGL, Features in OpenGL, OpenGL operations, Abstractions in OpenGL - GL, GLU & GLUT, a few examples of OpenGL programs.

References:

1. Donald Hearn and M. Pauline Baker, Computer Graphics, 2nd Edition, Prentice Hall, ISBN: 0135309247.

2. Donald D. Hearn, M. Pauline Baker and Warren Carithers, Computer Graphics with Open GL, 4th Edition, Prentice Hall, ISBN: 9780136053583.

3. Hill, Computer Graphics using OpenGL, 3rd Edition, Prentice Hall of India Private Ltd. New Delhi, ISBN: 8120338294.

4. Mason Woo, Jackie Neider, Tom Davis, Dave Shreiner, Dave Shriner and Tom David, Open GL Programming Guide, 6th Edition, Person, ISBN: 9780201604580.

5. The Official Guide to Learning OpenGL, Version 1.1, Available at http://www.glprogramming.com/red/.

6. Shreiner and Angel, Interactive Computer Graphics: A Top-Down Approach with Shader-Based OpenGL, 6th Edition, Pearson Education, ISBN: 0132545233.

CSS3E02c – CRYPTOGRAPHY AND NETWORK SECURITY

Objectives:

▪ To be familiar with classical and modern encryption and decryption techniques and apply in the security system.

▪ To understand various aspects of network security standards.

Course Outcome

CO1: Understand the fundamentals of cryptography.
CO2: Describe data integrity, authentication, digital signatures.

CO3: Analyze different network security applications
CO4: Familiarize standard algorithms that provide confidentiality, integrity and authenticity.
CO5: Understand network security technologies.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	0	4	3	2	3	3	1	3	3
CO2	3	1	3	3	2	3	3	2	3	3
CO3	3	1	3	3	2	3	3	3	3	4
CO4	3	1	3	4	2	3	3	3	3	3
CO5	3	1	3	4	2	3	3	3	3	3

Course Outline

Unit I: Computer security concepts – challenges – security attacks – security services – security mechanisms – a model for network security. Cryptography – symmetric encryption principles – cryptography – cryptanalysis – Feistal Cipher structure. symmetric block encryption algorithms - DES – Triple DES – AES – random and pseudorandom numbers – stream cipher and RC4 – cipher block modes of operation.

Unit II: Message authentication – approaches – MAC – one way Hash function – secure Hash functions – Message Authentication Codes. Public key cryptography principles –algorithms – digital Signatures.

Unit III: Network security applications - symmetric key distributions using symmetric encryption - Kerberos version 4 - key distributions using asymmetric encryption - X.509 certificates - public key infrastructure - federated identity management.

Unit IV: Transport level security - web security considerations - secure socket layer and transport layer security - SSL architecture - SSL record protocol - change cipher spec protocol - handshake protocol. Transport layer security - HTTPS - SSH. IP Security - overview - policy - encapsulating security payload - combining security associations - internet key exchange.

Unit V: Intruders - intruders, intrusion detection, password management. Malicious software - types, viruses, countermeasures, worms, DDoS. Firewalls - need - characteristics, types, firewall basing, location and configuration - DMZ networks, VPN - distributed firewalls.

References:

1. William Stallings, Network Security Essentials Applications and Standards, 4th Edition, Pearson India, ISBN: 8131761754.

2. William Stallings, Cryptography and Network Security: Principles and Practice, 6th Edition, Pearson India, ISBN: 9332518777.

3. Atul Kahate, Cryptography and Network Security, 3rd Edition, Tata McGraw- Hill Publishing, ISBN: 9789332900929.

4. Eric Maiwald, Fundamental of Network Security, 1st Edition, Tata McGraw - Hill Education, 0071070931.

5. Charlie Kaufman, Radia Perlman and Mike Speciner, Network Security: Private Communication in Public WorJd, 2nd Edition, PHI Learning Pvt Ltd, ISBN: 8120322134.

SEMESTER IV

CSS4P01 – PROJECT WORK

Objectives:

▪ To give a practical exposure to the process of software development life cycle.

▪ To develop a quality software solution by following the software engineering principles and practices. Students are also encouraged to take up a research-oriented work to formulate a research problem and produce results based on its implementation/simulation/experimental analysis.

Course Outcome:

CO1: Demonstrate a depth of knowledge of modern technology.
CO2: Practice to communicate effectively and to present ideas clearly and coherently to specific audiences in both the written and oral forms.

CO3: Understand the project requirements, reflect on their learning and take appropriate actions to implement it.
CO4: Estimate, plan, calculate, and adjust project variables.
CO5: Understand the importance of iteration, evaluation and prototyping in design of a software system.

Course Outline

Major project work is to be done individually by each student, under the guidance of a faculty member of the concerned department. Guide has to constantly monitor the works done by the student, imparting him/her the necessary inputs for the successful completion of the project work. Students can either take up real-life application-oriented project work or research and development projects. The student can formulate a project problem with the help of her/his guide and submit the project proposal of the same. Approval of the project proposal is mandatory. If approved, the student can commence working on it, and complete it. Guidelines for Submission of Report The distinguishing mark of a dissertation is an original contribution to knowledge. The dissertation is a formal document whose sole purpose is to prove that you have made an original contribution to knowledge. Failure to prove that you have made such a contribution generally leads to failure. It is a test of the student's ability to undertake and complete a sustained piece of independent research and analysis / application development, and to write up the work in a coherent form according to the rules and conventions of the academic community. The role of the supervisor too is very crucial in this context.

A satisfactory dissertation should not only be adequate in its methodology, in its analysis and in its argument, and adequately demonstrate its author's familiarity with the relevant literature; it should also be written in correct, coherent language, in an appropriate style, correctly following the conventions of citation. It should, moreover, have a logical and visible structure and development that should at all times assist the reader understand the arguments being presented. The layout and physical appearance of the dissertation should also conform to university standards. The dissertation is to be prepared in TEX format (either Latex or a suitable Windows TEX variant). The format of the report is included in Appendix A. Students are also encouraged to present their work in IT fest/conference/workshop/journal with the assistance and guidance of the supervisor. This should pave as a good start for the student in the art of publishing/presenting his/her work to the outside world. Due weightage is accommodated for publications out of the project work in the final evaluation.

CSS4E03f – WEB ENGINEERING

Objectives:

To understand the concepts, principles, strategies, and methodologies of web applications development.

Course Outcome

CO1: Understand basic concepts Web engineering
CO2: Describe Requirements Engineering (RE) for web applications and familiarize Web   application architecture and architecture for multimedia data.
CO3: Understand NOSQL databases and introduce MongoDB
CO4: Understand the basics of Modelling web applications and web application design.
CO5: Understand the elementary concepts of testing web applications.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	0	0	3	3	3	3	3	0	3
CO2	3	3	0	3	3	3	3	3	0	3
CO3	1	0	0	3	3	3	3	3	0	3
CO4	3	1	0	3	3	3	3	3	0	3
CO5	3	1	0	3	3	3	3	3	0	3

Course Outline

Unit I: Web Engineering (WE) – introduction – motivation – categories & characteristics of web applications – product related, usage related and development related – evolution of WE.

Unit II: Requirements Engineering (RE) for web applications - introduction - fundamentals - sources of requirements - RE activities - RE specifications in WE - RE principles for web applications - adapting RE methods for web applications development - requirement types, notations, tools.

Unit III: Web application architecture - introduction - fundamentals - definition of architecture - developing and characterizing architectures - components of a generic web application architecture - layered architecture - database centric architecture - architecture for web document management - architecture for multimedia data.

Unit IV: Modelling web applications - introduction - modelling specifics in WE - levels – aspects phases of customizations - modelling requirements - hypertext modelling - hypertext structure modelling concepts - access modelling concepts. Web application design - web design from an evolutionary perspective - information design - software design merging information design & software design - problems and restrictions in integrated web design - a proposed structural approach - presentation design - presentation of nodes and meshes - device independent development - approaches - interaction design - user interaction - user interface organization - navigation design - deigning a link representation - designing link internals - navigation and orientation - structural dialog for complex activities - interplay with technology and architecture - functional design.

Unit V: Testing web applications - introduction - fundamentals - terminology - quality characteristics - test objectives - test levels - role of tester - test specifics in we - test approaches - conventional, agile - test schemes - three test dimensions - applying the scheme to web applications - test methods and techniques - link testing - browser testing - usability testing - load, stress and continues testing - testing security - test- driven development. Web project development - scope - refining frame work activities - building a WebE team - risk management - making schedule - managing quality, change - project tracking.

References

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2. Roger S Pressman and David Lowe, Web Engineering: A Practitioner's Approach, 1st Edition, Tata Macgraw Hill Publications, ISBN: 9780073523293.

3. Leon Shklar and Rich Rosen, Web Application Architecture: Principles, Protocols and Practices, 2nd Edition, Wiley, ISBN: 047051860X.

4. Guy W Leeky-Thompson, Just Enough Web Programming with XHTML, PHP, and MySQL, 1st Edition, Cenagage Learning, ISBN: 159863481X.

5. Anders Moller and Michael Schwartzbach, An Introduction to XML and Web Technologies, 1st Edition, Pearson Education, New Delhi, 2009.

6. Chrits Bates, Web Programming: Building Internet Applications, 3rd Edition, Wiley India Edition, ISBN: 8126512903. MySQL, 1st Edition, Cenagage Learning, ISBN: 159863481X.

CSS4E04a – DIGITAL IMAGE PROCESSING

Objectives:

To be familiar with processing of the images, recognition of the pattern and their applications.

Course Outcome

CO1: Understand the fundamental concepts of a digital image processing
CO2: Apply various image enhancement techniques
CO3: Describe various image enhancement techniques
CO4: Implement algorithms for handling intensive image restoration problems.
CO5: Identify and compare various image segmentation and representation techniques and understand various image compression procedures.

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	3	3	3	3	3	3	3
CO2	3	1	2	3	3	3	3	3	3	3
CO3	3	1	2	3	3	3	3	3	3	3
CO4	3	1	2	3	3	3	3	3	3	3

CO5	3	1	2	3	3	3	3	3	3	3

Course Outline

Unit I: Introduction - digital image representation - fundamental steps in image processing elements of digital image processing systems - digital image fundamentals - elements of visual perception - a simple image model - sampling and quantization - basic relationship between pixels - image geometry.

Unit II: Image transforms - introduction to Fourier transform - discrete Fourier transform (DFT) - properties DFT- other separable image transforms - Walsh, Hadamard and Discrete Cosine transforms. Hotelling transform.

Unit III: Image enhancement - basic grey level transformation - histogram equalization - image subtraction - image averaging - spatial filtering - smoothing, sharpening filters Laplacian filters. Enhancement in the frequency domain - frequency domain filters smoothing, sharpening filters - homomorphic filtering.

Unit IV: Image restoration - model of Image degradation/restoration process - noise models inverse filtering - least mean square filtering - constrained least mean square filtering. Edge detection - thresholding - region based segmentation - boundary representation.

Unit V: Image compression - fundamental concepts of image compression - compression models - information theoretic perspective. Lossless compression - Huffman coding - arithmetic coding - bit plane coding - run length coding. Lossy compression - transform coding - image compression standards.

References

1. Richard E Woods and Rafael C Gonzalez, Digital Image Processing, 3rd Edition, Pearson Education Singapore Pte Ltd, ISBN: 8131726959.

2. B. Chanda and D.D. Majumder, Digital Image Processing and Analysis, 2nd Edition, PHI Learning Pvt Ltd, ISBN: 8120343255.

3. A.K. Jain, Fundamentals of Digital Image Processing, 2nd Edition, PHI Learning Pvt Ltd, ISBN: 8120309294.

4. W.K. Pratt, Digital Image Processing: PIKS Scientific Inside, 4th Edition, John Wiley, ISBN: 0471767778.

5. Milan Sonka, Vaclav Hlavac and Roger Boyle, Image Processing Analysis and Machine Vision, 3rd Edition, Ceneage Learning India Pvt Ltd, ISBN: 8131518833.