

**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**

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

## **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

*Onwards*

**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:  $P=G \times C$ . '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.



*Onwards*

- 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.

### 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

Onwards

	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.

Onwards

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.

Onwards

	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	SI 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**

<b>Course Objectives</b>
<ol style="list-style-type: none"> <li>1. To develop the ability to appreciate life and literature</li> <li>2. To cultivate an interest in society and culture</li> <li>3. To envisage creative approach to life and literature</li> </ol>

<b>Course Outcomes</b>
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 →	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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 Glaspé

*Onwards*

**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.

**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.

<b>Course Objectives</b>
<ol style="list-style-type: none"> <li>1. To identify the key concepts of English grammar.</li> <li>2. To describe the use of appropriate language through the understanding of the sentence patterns in English.</li> </ol>
<b>Course Outcomes</b>
CO1: Demonstrate the ability to use the syntactic structures within English texts.

Onwards

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
CO5									

### **COURSE DESCRIPTION:**

#### **A. COURSE SUMMARY**

Module 1: 26 hrs

20

BOS meeting approved: 04.10.2022

Approved in Academic Council meeting on 12.10.2022

*Onwards*

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 COMMUNICATION IN ENGLISH

CODE TITLE: ENG1A02

AUTHOR: BoS English (UG) University of Calicut

PUBLISHER: University of Calicut

21

*BOS meeting approved: 04.10.2022*

*Approved in Academic Council meeting on 12.10.2022*

Onwards

**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

Onwards

## 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,  
Vismayachihngal-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 →	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO 2	PSO 3	PSO 4
CO ↓									
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

Onwards

## 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
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Onwards

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**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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

Onwards

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,

Onwards

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**

<b>Course Objectives</b>
1. To learn application of derivatives
2. To learn more about application of integration
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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.**

*Onwards*

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  $\pm\infty$  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



Onwards

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.**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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

Onwards

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

### Course Description

#### Module I

Onwards

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.

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

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

### 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

### 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→	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

## 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→	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

### **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.

<b>Course Objectives</b>
1. To help the students to identify a better career option.
<b>Course Outcomes</b>
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.

*Onwards*

#### 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.



Onwards

### **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.

## 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.

<b>Course Objectives</b>
<ol style="list-style-type: none"> <li>1. To inculcate and apply the concepts of democracy and freedom in life and understand the basic tenets of our constitution</li> <li>2. To critically think and examine various social issues prevailing in our society</li> </ol>
<b>Course Outcomes</b>
<p>CO1: Discuss and contemplate on the areas of gender inequality, marginalization, disability studies, racism and casteism</p> <p>CO2: Develop sensitivity towards environmental concerns and feel responsible towards protecting nature.</p> <p>CO3: Understand the everyday realities of the marginalized sections of the society and negate the stereotypes surrounding them and accept them as allies.</p> <p>CO4: To develop scientific temper and scientific thinking</p>

#### **CO-PO/PSO Mapping**

Onwards

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

**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

*Onwards*

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 Chaturvarna” (Article) - Chandra Bhan

Prasad

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

Onwards

## 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.

Garty, 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: Identify 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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
<b>CO1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>CO2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>

Onwards

## **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 Warriar
3. “Ghoshayatra” (Poem excerpt) – Kunchan Nambiar

Module 2: Evolution

1. Excerpt from Indulekha (Novel) -O. Chandu Menon
2. Excerpt from “Atmopadeshathakam” (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

*Onwards*

**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

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Onwards

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.**

<b>_Course Objectives</b>
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
<b>Course Outcomes</b>
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.

Onwards

### 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 (Jeevithapatha)

Onwards

Santhanagopalam -M N Palooru (Kadhayillathavante Kadha)

Ulsavakalam – Chandramathi (Njandukalude nattil oridavela)

**HIN2A08(3) Poetry and Short Stories**

**No. of sessions: 80 hrs.**

<b>Course Objectives</b>
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.
<b>Course Outcomes</b>
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**

Onwards

- 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

Onwards

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 correspondance commerciale francais (Lessons in pages 1to39)

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

### **BCS2B02– Problem Solving using C**

**No. of sessions: 64 hrs.**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
<b>CO1:</b> Identify and understand the basics of C program structure ,Familiarization of IDE, Tokens, Variable Declaration and how to define symbolic constant.
<b>CO2:</b> 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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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

Onwards

## **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**

<b>Course Objectives</b>
1. To learn matrices and its applications
2. To learn more about convergence and divergence of sequences & series
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									



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-  $\epsilon - N$  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-

Onwards

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 8.4: 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 8.12 Diagonalization- 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.**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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

Onwards

<b>CO4</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>

**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**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
<b>CO1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

Onwards

## **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 should 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  $S = 1 + (1/2)2 + (1/3)3 + \dots$  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.



Onwards

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**

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

**CO-PO/PSO Mapping**

<b>PO→</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>
------------	------------	------------	------------	------------	------------	-------------	-------------	-------------	-------------

Onwards

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

*Onwards*

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:

*Onwards*

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

Onwards

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

### 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
<b>CO1:</b> Identify and recall Python programming basics and paradigm, demonstrating an understanding of fundamental concepts in Python programming.
<b>CO2:</b> Demonstrate an understanding of Python looping and control statements, interpreting how they function within the context of programming tasks.
<b>CO3:</b> 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.
<b>CO4:</b> 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.
<b>CO5:</b> Equip students for developing mini projects using Python standards.

#### CO-PO/PSO Mapping

PO→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

Onwards

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.

## 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 ↓									
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO6</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>

**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,

Onwards

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**

<b>Course Objectives</b>
1. To learn basics of transducers
2. To learn construction and working of transducers
3. To understand various types of transducers
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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.

Onwards

**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**

<b>Course Objectives</b>
1. To learn vector valued functions
2. To learn more about Complex numbers and related theorems
<b>Course Outcomes</b>
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

Onwards

### 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 regions, 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 17.3: 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

78

Onwards

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.**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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

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

**CO-PO/PSO Mapping**

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



Onwards

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.

<b>Course Objectives</b>
1. To understand the real time software development environment. The student can gain a thorough knowledge in developing a application using python
<b>Course Outcomes</b>
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→	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

### 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.

*Onwards*

### **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

Onwards

## **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 Chiranjevi 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

*Onwards*

➤ 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.

➤ Seating 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**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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**



Onwards

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

## **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.

Onwards

**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: Bound 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.**

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

Onwards

<b>Course Outcomes</b>
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**

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

Onwards

<b>CO5</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
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## **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**

92

<b>Course Objectives</b>	
1. To learn matrices and its applications	
2. To learn more about convergence and divergence of sequences & series	
<b>Course Outcomes</b>	
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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

Onwards

CO5	2	1	0	1	1	1	0	1	0
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## 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

Onwards

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.**

95

<b>Course Objectives</b>
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. To learn the Digital modulation techniques
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>
<b>CO2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>CO3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>



Onwards

<b>CO4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>CO5</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>

**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-emphasis , 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**

Onwards

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

Onwards

- 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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Onwards

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**

<b>Course Objectives</b>
1. To provide students the confidence and skills to successfully transition to new system
<b>Course Outcomes</b>
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**

<b>PO→</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>
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Onwards

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.

<b>Course Objectives</b>
To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
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.

<b>Course Objectives</b>
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.
<b>Course Outcomes</b>
CO1: To acquire programming skills in developing graphics based applications
CO2: To develop the skill of animation

**CO-PO/PSO Mapping**

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

**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

*Onwards*

### **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**

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*Onwards*

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](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

*Onwards*

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, 13th edn.
14. Who's News? Ammu Joseph and Kalpana Sharma, Sage Publications, New Delhi, 1994

Onwards

**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 ↓									
<b>CO1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>
<b>CO3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO4</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>

### 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

*Onwards*

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**

Onwards

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→	PO1	PO2	PO3	PO4	PO5
CO ↓					
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**

*Onwards*

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

Onwards

<b>CO1</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

### Syllabus

#### **Unit I**

Introducing the android computing platform, History of android, android 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**

*Onwards*

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, SQLite - SQLite types,database manipulation using SQLite, 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**

Onwards

**No. of sessions: 80**

<b>Course Objectives</b>
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
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
CO1	2	2	0	3	2	3	2	2	3

Onwards

<b>CO2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>

### **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

Onwards

#### **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**

<b>Course Objectives</b>
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 solve simple problems
4. To learn the basics of GIMP
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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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Onwards

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



Onwards

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).

*Onwards*

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' derived from 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.

Onwards

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

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*Onwards*

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 numbers from 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.

Onwards

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  $\leq$  2000 0

2500 < gross  $\leq$  4000 3%

4000 < gross  $\leq$  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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Onwards

- 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**

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

<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
<b>CO1</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**Part A: Android Programming**

*Onwards*

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



*Onwards*

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

*Onwards*

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 Armstrong 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.

*Onwards*

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.

<b>Course Objectives</b>
To prepare students for jobs in multinational companies, by exposing them to newer technologies and development methodologies.
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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.

<b>Course Objectives</b>
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.
<b>Course Outcomes</b>
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→	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO ↓									
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)

Onwards

**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

Onwards

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