



1.3.2 Average Percentage of Courses that include experiential learning through Project work/field work/internship

ELECTIVE-II: INSTITUTIONAL TRAINING		BCS-DSE02
Inst.Hrs : 6		YEAR: III
Credits : 5		SEMESTER: VI
Learning outcomes		
<ol style="list-style-type: none">1. To bridge the gap between theory & practice and stimulate trainee's desire to face the challenges and problems in a corporate environment.2. To get an overview of the practical aspects of company secretaryship.		
<p>Supervised Institutional Training shall be an integral part of B.Com (Corporate Secretaryship) Degree Course. It is a sort of job testing programme designed to bridge the gap between theory & practice and create a natural interest in the practical aspects of the Company Secretaryship so as to stimulate trainee's desire to face its challenges and problems.</p>		
<p>The training should be given under the joint supervision and guidance of the Training Officer of the Organisation/Institution and Faculty member of Corporate Secretaryship of the college. The details of the training given and the assessment of each student in that regard should be fully documented.</p>		
<p>The duration of the training shall be for a period of 30 days. The training shall broadly relate to</p>		
<ol style="list-style-type: none">(a) Office Management(b) Secretarial Practice.		
<p>The training relating to Office Management may be designed to acquaint the trainees with:</p>		
<ol style="list-style-type: none">1. Company's activities, organization structure, departments and authority relationship.2. Study of layout, working conditions, office maintenance, safety and sanitary conditions.3. Study of the Secretarial service, communication, equipment, postal and mailing services and equipments.4. Acquaintance with office machines and equipment and accounting machines.5. Acquaintance with filing department, sales, purchases, sales accounts, salary, administration and personnel departments.		



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The training pertaining to Secretarial Practice shall be on all aspects of the functions of a corporate secretary.

The following types of organizations may be selected for the training:

1. Public Limited Companies (Both Industrial and Commercial).
2. Statutory bodies, Public Enterprises and Public Utilities like L.I.C., Electricity Board, Housing Board and Chambers of Commerce, Cooperative Societies and Banks.
3. Office Equipment Marketing Organizations.
4. Office of a Practicing Chartered Accountant, Cost Accountant or Company Secretary.

NOTE:

The report must be submitted by the candidate, under the guidance of the faculty members of the respective colleges. The training officers of the concerned organisation/institution are requested to provide the necessary documents, information and impart knowledge to the candidate in order to complete the project.

The Report shall include information about the profile of the company, products, projects, milestones, organisation structure, details of departments, and analysis of financial performance. The report shall be around 50 typed pages, excluding tables, figures, bibliographies and appendices. The department of the respective college shall evaluate the report for 100 marks and conduct Viva-Voce (both by internal and external examiners). The marks shall be sent to the University as per the procedure. A candidate failing to secure the minimum for a pass (40%) shall be required to resubmit this report to the department and the marks after valuation shall be forwarded to the University before the commencement of the examination.

The external examiner in consultation with internal examiner should conduct Viva-Voce and evaluate the report.

Media Studies

<u>S.No</u>	Name of the Course (as per the curriculum)
1	Photography and Videography
2	ADVERTISING PHOTOGRAPHY
3	PROJECT (MEDIA INTERNSHIP)

**CC-IV- Photography and Videography (Practical)****Course Description**

This course provides an introduction to the fundamentals of photography and videography. Students will learn about the history and development of photography and videography as art forms. The course covers basic camera functions and equipment, including aperture, shutter speed, ISO, focal length, and different types of cameras and lenses. Students will gain hands-on experience with lighting, composition, and framing. They will explore techniques for capturing portraits, landscapes, action shots, and low light scenes. Students will also learn the basics of photo and video storytelling.

The course discusses the similarities and differences between human visual perception and what a camera captures. Students will compare image properties like color, contrast, and sharpness. They will analyze the aesthetics of effective photographs and videos. The course also covers new trends in mobile photography, including the rise of Instagram and social media.

Students will get the opportunity to put skills into practice through a series of practical exercises and assignments. By the end of the course, students will understand the technical and creative elements involved in photography and videography. They will be able to take visually compelling photographs and videos for both personal and professional use. The course provides a foundation for further study in commercial photography, photojournalism, videography, and related fields.

Course Objectives

1. Explain the fundamental concepts and principles of photography and videography.
2. Demonstrate the proper use of cameras and equipment such as lenses, lighting, and composition.
3. Apply techniques for capturing portraits, landscapes, action shots, and low light scenes.
4. Analyze and critique photographs and videos for aesthetics and effectiveness.
5. Create a portfolio of photographs and short videos using skills and techniques from the course.

**Unit 1: Introduction to photography and videography:**

History of photography and videography, Composition and framing in photography and videography, The rule of thirds, Leading lines, understanding the principles of composition (balance, contrast), Manual and autofocus, Camera Movements and angles: Wide, Close up, Zoom, Pan, Tilt, and Aerial; Settings and subjects: Selecting the right setting for your subject and how to choose the right subject for your setting. Importing images: Pictographic Learning how to transfer images from your camera to your computer and organize them.

Unit 2: Understanding the Camera, Visual Perception and storytelling:

Comparing Human Eye and Camera: Similarities and differences in visual perception; Aesthetics, The role of storytelling in photography and videography, Techniques for crafting compelling visual narratives

Unit 3: Camera Design, Structure, and Operations:

Mastering Camera Settings: Aperture, shutter speed, focal length, and depth of field, Exploring Camera Modes: Manual, aperture priority, shutter priority, and program modes; Using long exposures, panning, and other techniques to create creative photographs; Basics for the Preparation of Panoramic Picture; Focus: Understanding the importance of choosing the right focus point for your subject, Exploring the pros and cons of manual and autofocus; Selecting autofocus points: Understanding how to choose the right autofocus points for your subject, Focusing for effect: Creating interesting and creative photos by controlling the focus in different ways.

Unit 4: Equipment Familiarisation:

Hands-on practice with different cameras, lenses, filters, Colour Correcting Filters, Diffusion Filters, and mobile photography; Film Camera Types: RED, ARRI, Sony, Blackmagic, and their Characteristics; Camera Working: Understanding Camera Operations and Movements, Measuring Devices. Types of lenses and their uses: normal, close up lens, telephoto, macro special lenses - mechanism and structure extensions. Functions of Sensor, Menus and Options in DSLR, Memory Card, Types of Memory Card, Memory Card Speed Class, Accessories, Format: JPEG, RAW Usage of Filters: Day, Night, Light meters and filters, Light Accessories: Light Meter, Flash Trigger, Modifiers - Umbrella, Soft box, Strip box, Octabox, Reflector, Snoot, Barn Door, Beauty Dish, Grid, Gels, Flags, Studio Accessories: Stands, Backdrops etc.

Unit 5: Light, Light sources and Lighting techniques

Properties of Light – Additive and Subtractive Light – Contrast and Lighting Ratios – Direct and Indirect Light; Lighting Techniques: Three point and Five Point Lighting; Techniques for controlling lighting, color, temperature control; Outdoor Lighting: Techniques, Challenges, and Solutions, Studio Lighting: Equipment, Techniques, and Accessories, Light Sources: Natural and Artificial Lights, Understanding Light: Direct Light, Diffused Light, Reflected Light, Hard Light, Soft Light, Photography Lighting: Flash, Strobe and Continuous Light, Lighting Setup: Hard Light, Fill Light, Back Light, Rim Light, Background Light, Three Point Light Setup, Advanced Light Setup, Portrait Lighting Setup. Techniques

**Professional Photography and Image Editing (Practical)****Course Description:**

Embark on a captivating journey into the world of photography image editing with our comprehensive Basic Photography course. This course is designed to equip beginners with the fundamental skills and knowledge necessary to excel in the art and science of photography. The curriculum is divided into five units that provide a solid foundation in various aspects of photography. The course focuses on understanding the camera and visual perception, covering topics like the human eye, camera basics, and various equipment. The course dives into lighting and exposure, exploring techniques for indoor and outdoor lighting, exposing, and focusing. Students learn about film, color, and light manipulation, including types of film and techniques for controlling color and light in photography. Unit IV covers developing and printing, teaching students about the essential tools, materials, and processes involved. Finally, the course delves into photography for communication and advertising, discussing aesthetics, photojournalism, and planning successful photography sessions. The course also includes detailed exercise on image editing using open source, like GIMP as well as commercial software like PhotoShop. Throughout the course, students will engage in practical exercises and hands-on experiences, enabling them to master the art of photography and unleash their creative potential.

Course Objective

1. Comprehend the fundamental concepts of camera operation, visual perception, and various photography equipment (Knowledge).
2. Apply proper lighting and exposure techniques to create visually impactful and well-lit photographs (Application).
3. Analyze different types of film, color, and light manipulation techniques to enhance photographic results (Analysis).
4. Clean and refine images using appropriate tools, materials, and processes (Synthesis).
5. Evaluate the principles of aesthetics, photojournalism, and advertising photography to effectively communicate visual messages (Evaluation).

Detailed Syllabus

Procedural Knowledge on Professional Photography
(Viva/Written Test Topics For Practical Examination)

**Unit 1: Mastering the Basics**

Understanding What Makes a Good Photo, Defining what makes a good photo, The importance of subject and settings, Understanding composition and lighting, Analyzing great photos

Mastering Focusing Techniques, The basics of focusing, Manual vs. autofocus, Selecting the right autofocus points, Using focus for effect, Reviewing your shots and sharpening techniques

Navigating Shooting Modes, Different shooting modes, Basic camera modes vs. scene modes, Understanding exposure compensation, Exploring camera modes, Adjusting brightness and reviewing your shots

Getting the Right Exposure, Assessing exposure, Controlling exposure with the exposure meter, Fine-tuning exposure, Exploring exposure, Reducing noise and reviewing your shots

Achieving the Right Contrast, Understanding the right contrast, The effects of contrast and dynamic range, Shooting an HDR photo, Playing with contrast, Adjusting contrast and reviewing your shots

Unit 2: Advanced Shooting Techniques

Using Depth of Field, Understanding depth of field, Using shallow and deep depth of field, Exploring depth of field, Adjusting depth of field and reviewing your shots

Mastering Lenses, Primes vs. zooms, Lens distortions and correcting lens problems, Changing perspective and testing out lenses, Wide-angle lenses and shooting landscapes, Telephoto lenses and creating panoramic photos

Taking Close-Up Photos, How close is close-up?, Close-ups vs. macros, Shooting a close-up and exploring close-ups, Reviewing your shots and using the Adjustment Brush tool

Conveying Movement, Looking at movement, Freeze and blur techniques, Mastering panning shots, Adding blur and reviewing your shots

Composing Like an Expert, Looking at composition, Understanding the "rules" of composition, Using the rule of thirds and contrast in composition, Capturing reflections and mastering composition, Targeted adjustments and reviewing your shots

Principles of Aesthetics: The elements and principles of design in photography

Unit 3: Understanding Lighting

The Importance of Color, Color relationships and optimizing color, Playing with color and adjusting color, Reviewing your shots and learning about the Color Balance tool

The Color of Light, The quality of light and color, Setting white balance and using white balance, Reviewing your shots and adjusting color temperature

Using Natural Light, Can you read light?, Light and shadow techniques, Using light and shade and playing with light, Reviewing your shots and learning about the Levels tool

Working with Flash, Understanding what flash does, Using a flashgun and off-camera flash, Using

Unit 4: Professional Photography

Black and White Photography, Will black and white work? Color to black and white conversion, Shooting in black and white and removing color, Reviewing your shots and learning about black-and-white conversion

Working on a Project, Choosing the right project, editing a photo shoot and adding keywords, Taking on a project and reviewing your project

People and Portrait Photography, Indoor and outdoor lighting techniques for portraits, The casual portrait and environmental portraits, Group portraits, familiar subjects, and other details

Unit 5: Speciality Photography

Advanced Shooting Techniques for Different Genres, Basic shooting and lighting techniques for different genres of photography, Black and white, landscape, cityscape, architecture, advertising, tabletop photography, Fashion, food, automobile, sports, travel, children, portrait, wildlife, still life, event, silhouette, festival and themes

Professional Photography, Branches of Professional Photography, Scopes of Professional

**Summer Internship/Industrial Training****Summer Internship/Industrial Training****Course Description**

This is a six-week internship course that provides students with on-the-job experience in various media industries. Students will choose from opportunities at newspapers, magazines, radio, television, advertising and PR agencies, digital marketing companies, or other media identified by students and faculty.

Over the six weeks, students will work directly in their chosen media field, gaining valuable professional experience. They will shadow staff, assist with daily work activities, attend meetings, and take on tasks that develop both hard and soft skills. The goal of the internship is for students to understand the dynamics of their chosen media career path through direct participation in a professional environment.

To complete the course, students will submit a comprehensive report detailing their experience. The report will describe the company, responsibilities, projects worked on, key lessons learned, and how the experience will impact their future career. Students will also deliver a presentation on their internship experience to faculty members. The report and presentation will demonstrate their understanding of the media landscape and how their skillset was enhanced in their role.

The internship and all assignments will be jointly evaluated by a faculty member and the company supervisor. Eighty marks will be awarded for the report and presentation, evaluating the depth of experience gained and communication of key takeaways. The final 20 marks will be awarded based on the company supervisor's assessment of work performance and participation during the internship. Overall, this internship course provides valuable work experience and networking opportunities for students preparing to enter media professions.

Course Objectives

1. Apply theoretical knowledge gained in media studies courses to practical work situations.
2. Conduct research and analysis on media organizations and industry trends to determine suitable internship placements.
3. Develop professional communication skills through interaction with company staff and completion of workplace tasks.
4. Demonstrate competency with media-specific tools and programs used in the internship organization.
5. Evaluate effectiveness of the internship experience in developing workplace skills and prepare a comprehensive report on key takeaways.

PROJECT (V & VI semesters)

Given the special nature of the Visual Communication course, Project is compulsory. Students, however, could choose any area including advertising, computer graphics, photography and television production.

Project will be done in three phases.

Phase -1: Selection of the topic, doing the necessary background research on the topic, and writing the project proposal. This Phase is to be completed during Semester V.

Phase -2: Internship / industry experience in the area related to the Project topic, and submitting the internship report. This Phase is to be completed before the commencement of the next Phase.

Phase -3: Professional execution of the project as per the proposal approved. This will be done during Semester VI. A Viva will be conducted at the end of Semester VI.

Each Phase will be assessed as per the following scheme: Phase -1 – 20 marks, Phase -2 – 20 marks, Phase -3 – 40 marks, and Viva – 20 marks.

**English**

<u>S.No</u>	Name of the Course (as per the curriculum)
1	Film and Literature
2	Writing for the New Media
3	ENGLISH FOR COMMUNICATION
4	Public Speaking Skills
5	COPY EDITING
6	THEATRE FOR COMMUNICATION
7	SS: TECHNICAL WRITING
8	TRANSLATION AND COMMUNICATION
9	INTERNSHIP
10	RESEARCH METHODOLOGY AND PROJECT



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SYLLABUS WITH EFFECT FROM 2020-2021

Title of the Course	Elective BEN-DSE3C: FILM AND LITERATURE		
Category of the Course	Year & Semester Third Year & Sixth Semester	Credits 5	Subject Code
Hours:	90		
Objectives:	<p>The aim of the course is to introduce students to</p> <ul style="list-style-type: none"> the basics of films, their kinds and related terms and concepts. aspects of films that are adaptations of works of written literature examine, analyze, interpret and review films acquire basic skills to pursue a career in film journalism 		
Course Introduction (to be considered for internal assessment only)	<ul style="list-style-type: none"> What is the role of literature as a source for films? Make an overview of films that was adapted from literary works over the years. What is the significance of a film review -print and online? How do films enhance language and communication? 		
Course Components	<p>Unit 1</p> <p>1.1 What is Cinema?</p> <p>1.2 Genres and Sub Genres</p> <p>-Avant -Garde, Documentary, Film Noir</p> <p>1.3 Mainstream and Parallel Cinema</p> <p>1.4 Adaptation [Novel, Play, Short Story] based on "A Theory of Adaptation" by Linda Hutcheon- Chapter1 - "Beginning to theorize adaptation"</p> <p>1.5 Auteur Theory</p> <p>Unit 2</p> <p>2.1 Film Narrative: Title - Story - Plot - Script- Narration (Restricted and omniscient) - duration - motivation - motif- parallelism - character traits - cause and effects - exposition - climax - point of view</p> <p>2.2 Shots, Scenes, Mise en scene, Sequences</p> <p>2.3 Light, Sound [Diegetic, Non Diegetic], Costume</p> <p>2.4 Cinematography , Direction, Acting</p> <p>2.5 Editing and its types</p> <p>Unit 3</p> <p>3.1 Animation</p> <p>-Film 'The Jungle Book' (1967) directed by Wolfgang Reitherman (Adaptation of Rudyard Kipling's <i>The Jungle Book</i>)</p> <p>3.2 Musical</p> <p>- Film 'My Fair Lady' (1964) directed by George Cukor</p>		

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	<p>Unit 4</p> <p>4.1 Science Fiction/ Sci-Fi</p> <p>- Film 'War of the Worlds'(2005) directed by Steven Spielberg (Adaptation of H.G. Wells' <i>War of the Worlds</i>)</p> <p>4.2 Detective</p> <p>- Film 'Murder on the Orient Express'(2017) directed by Kenneth Branagh (Adaptation of Agatha Christie's <i>Murder on the Orient Express</i>)</p>
	<p>Unit 5</p> <p>5.1 The Influence of Film and Literature (Case Study- Western) in Popular Culture- - Literary Model, Language, Attire, Entertainment, Art, Sport, Fashion, Music</p> <p>5.2 Writing a Film Review</p> <p>-Plot, Genre, Role of actors, Background information, condensed synopsis, argument/analysis, evaluation, recommendation, opinion</p>
Learning Outcomes:	<p>At the end of the course, the students will be able to</p> <ul style="list-style-type: none"> define what is cinema and its genres identify the aspects of translation from text to screen-visual representation demonstrate a knowledge of film narrative and techniques explain the terminologies for analyzing images, sound and costume in narrative film synthesize the themes and issues portrayed in both forms critically analyze a film

**SOFT SKILL COURSES****01. PSSEA - LANGUAGE AND COMMUNICATION****Objectives**

- *enable* students to convert the conceptual understanding of communication in to everyday practice.
- *train* students to ground concepts/ideas in their own experience.
- *create* a learner-language interface enabling students to exercise control over language use.
- *sensitise* students to the nuances of the four basic communication skills – Listening, Speaking, Reading and Writing.

UNIT I: Twinning Functions of Listening and Speaking.

UNIT II: Twinning Functions of Reading and Writing.

UNIT III: Individual Communication.

UNIT IV: Intermediary Communication.

UNIT V: Social Communication.

02. PSSEB - SPOKEN AND PRESENTATION SKILLS**Objectives**

- *coach* students to identify, classify and apply relevant skill sets.
- *illustrate* role of skills in real-life situations with case studies, role play, etc.
- *translate* performance of skills into efficient habits.
- *enable* students to perceive cultural codes involved in presentation and design language performance accordingly.

UNIT I: General Language Knowledge and Presentation.

UNIT II: Special Language Knowledge and Presentation.

UNIT III: General Communication Skills for Presentation.

UNIT IV: Professional Communication Skills for Presentation.

UNIT V: Social Communication Skills for Presentation.

**03. PSSEC - MANAGERIAL SKILLS****Objectives**

- To help students to understand the mechanism of stress particularly negative emotions such as anxiety, anger and depression for effective management.
- To introduce the basic concepts of body language for conflict management.
- To give inputs on some of the important interpersonal skills such as group decision-making, negotiation and leadership skills.
- To make students learn and practice the steps involved in time management.
- To impart training for empowerment thereby encouraging the students to become successful entrepreneurs.

Unit I- Stress management

- Definitions and Manifestations of stress.
- Stress coping ability and stress inoculation training.
- Management of various forms of fear (examination fear, stage fear or public speaking anxiety), depression and anger.

Unit II- Conflict Management skills

- Types of conflict (intrapersonal, Intra group and inter group conflicts).
- Basic concepts, cues, signals, symbols and secrets of body language.
- Significance of body language in communication and

assertiveness training.

- Conflict stimulation and conflict resolution techniques for effective management.

Unit III- Interpersonal Skills

- Group decision making (strengths and weaknesses).
- Developing characteristics of charismatic and transformational leadership.
- Emotional intelligence and leadership effectiveness- self awareness, self management, self motivation, empathy and social skills.
- Negotiation skills- preparation and planning, definition of ground rules, clarification and justification, bargaining and problem solving, closure and implementation.

Unit IV- Time Management

- Time wasters- Procrastination.
- Time management personality profile.
- Time management tips and strategies.
- Advantages of time management.

Unit V- Towards Empowerment

- Stimulating innovation and change- coping with "temporariness".
- Network culture.
- Power tactics and power in groups (coalitions).
- Managerial empowerment and entrepreneurship.
- Prevention of moral dwarfism especially terrorism.
- Altruism (prosocialbehaviour/helping behaviour).
- Spirituality (clarifications with regard to spirituality)- strong sense of purpose-trust and respect- humanistic practices- toleration of fellow human beings expressions.

**04. PSSED - COMPUTING SKILLS**

Objective: The major objective in introducing the Computer Skills course is to impart training for students in Microsoft Office which has different components like MS Word, MS Excel, MS Access, Power point etc., at two levels based on their knowledge and exposure. It provides essential skills for the user to get adapted to any work environment, as most of the systems in any6 work place have MS Office installed for their day to day activities. The course is highly practice oriented rather than regular class room teaching.

Pre-requisite: Pass in Level B are an equivalent course.

Unit I: *Word Processing* – Formatting – Paragraph and character styles, templates and wizards, table and contents and indexes, cross referencing; Tables and Columns – creating manipulating and formatting; Mail Merge, Labels and Envelopes.

Unit II: *Spreadsheets* – Workbook, Building, Modifying, navigating; worksheet-Autofill, copying and moving cells, inserting and deleting rows, printing; Formulas and functions- Troubleshooting formulas, Functions and its forms like database, financial, logical, reference , mathematical and statistical – Databases – Creating, sorting, filtering and linking.

Unit III: *Presentations* – Power point – exploring, creating and editing slides, inserting tables and charts- special effects- Clip Art, creating and drawing shapes, inserting

Unit III: *Presentations* – Power point – exploring, creating and editing slides, inserting tables and charts- special effects- Clip Art, creating and drawing shapes, inserting multimedia content – presentations – planning, animation, handouts, slideshow..

Unit IV: *Databases* – Access – Components, creating a database and project, import and exporting, customizing; Tables- creating and setting fields; Queries –Types, creating, wizard- Reports- creating and layout.

Unit V: *Information Management* – Outlook – Starting, closing, contacts, tool bars, file management; email-reading, composing, responding, attachments, signature, junk mail; tasks- screen, sorting, creating, deleting, assigning, updating; scheduling- calendar.

**05. Translation and Communication**

(Credits – 2)

Unit-1 Introduction to Communication Processes, Stages and Skills**Unit-2** Written Communication: Types, Tools and Skills**Unit-3** Communicating through Translation: Principles and Strategies**Unit-4** Translation Types, Methods and Practices**Unit-5** Translation Exercises: corporate and official letters, product fliers and manuals and general notices/posters.**06. Contemporary Awareness**

(Credits – 2)

The course would focus on enhancing analytical abilities and facilitate general awareness of a variety of subjects, which will have relevance for a career

Unit I: Recent Developments in Science and Technology with a focus on transformational discoveries and current understanding of theories and concepts including development in Space, Telecommunication, and Computers.

Unit II: Contemporary Events of National Importance, Demography, Human Resource and related issues. Behavioral, and Social Welfare issues and problems, Law Enforcement issues, human rights, corruption in public life, communal harmony etc. Internal Security and related issues, Environmental issues, ecological preservation, The Role of national institutions

Unit III: International Affairs: Working of various International Institutions/Organizations- important events in world affairs – International Treaties – Perspectives of Leading statesmen and Policies affecting large number of nations, Nuclear Policies

Unit IV: Indian Polity and Economy – Economic Data, Economic Reforms – Specific Programs of the Central and State governments towards development – Government bodies which are planning, distributing and regulating finances, economic and trade issues, Foreign Trade, the role and functioning of international monetary Organizations like I.M.F., World Bank, W.T.O.etc.



Unit V: Geography of India and the World – Geographical facts, location of specific institutions and places, features of Indian agricultural and natural resources.

Essay themes: Economic Issues, Social evils and solutions, Violence, Health Issues, Global Problems

07. TECHNICAL WRITING AND PRESENTATION

Objectives of the Course: Aims to teach oral and written skills in English with illustrations and examples drawn from project reports, paper presentations and published papers in scientific journals. The grammar exercises are not taught in a rule-based manner but through observation and use in specific contexts. Newspaper and popular scientific reports are also included as course material. Presentation skills are taught through practice sessions. During the course, all participants make presentations and also critique the presentations by others. Emphasis is placed on teaching how to present the same findings orally and in writing.

Syllabus Outline:

Unit I Reinforcement of Language Skills

[Correcting common errors] – Verbosity –

How to avoid unnecessary jargon – Words and Usage – List of “aura” words,

Synonyms and Antonyms – Phrasing, Tense, Voice, Prepositions, Punctuation.

Type of technical reports – creating specs, lab manuals, worksheets.

Unit II Organization of Ideas

1. Preparing a Basic plan – Structuring the ideas, collecting the relevant materials
2. Creating Outlines – Headings of Sections, Topic Sentences.

**Unit III Contents of a Report** [Some Basic Research Methodology]

1. Cover and title page
2. Table of Contents
3. List of Tables and Figures
4. Preface, Foreword, Acknowledgement
5. Abstract
6. Introduction
7. Body (in Sections and Subsections)
8. Results
9. Conclusions and Recommendations
10. Appendices
11. References

Unit IV Format [Both physical and stylistic]

1. Margins
2. Headings
3. Indentation
4. Pagination
5. Type face and fonts
6. Abbreviations
7. Symbols
8. Layouts
9. Proofreading Symbols

Unit V Presentation of the Report

1. Difference between Oral Presentations and Written Reports (Even when the material is the same)
2. How to give a good presentation?
3. Proper use of technological aids
4. Discussion skills

SOFT SKILL COURSES**CREDITS: 3****08. QUANTITATIVE APTITUDE****Unit-I**

Divisibility – HCF and LCM – Decimal Fractions – Square roots and Cube Roots – Surds and Indices.

Unit-II

Averages – Percentage – profit and loss - Ratio and Proposition – Partnership – Alligation and mixture.

Unit-III

Time and work – Pipes and Cistern – Time and Distance – Boats and Streams.

Unit-IV

Simple Interest – Compound Interest – Stocks and Shares – True Discount – Banker's discount.

Unit-V

Logarithms – Area – Volume and surface Areas – Heights and Distances – Data Interpretation : Tabulation – Bar Graphs – Pie Charts – Line Graphs.



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[Correcting common errors] – Verbosity –
How to avoid unnecessary jargon – Words and Usage – List of “aura” words,
Synonyms and Antonyms – Phrasing, Tense, Voice, Prepositions, Punctuation.
Type of technical reports – creating specs, lab manuals, worksheets

Unit II Organization of Ideas

1. Preparing a Basic plan – Structuring the ideas, collecting the relevant materials
2. Creating Outlines – Headings of Sections, Topic Sentences.
3. Reviewing Sentences and Rewriting Paragraphs
4. Revising Drafts

**Unit III Contents of a Report [Some Basic Research Methodology]**

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Unit V Presentation of the Report

1. Difference between Oral Presentations and Written Reports (Even when the material is the same)
2. How to give a good presentation?
3. Proper use of technological aids
4. Discussion skills

Recommended Texts :

E Handouts of Rensselaer Polytechnic, USA. [necessary permission has to be obtained by the course instructor for classroom use] www.rpi.edu
Gupta, Ruby and Anugrah Rohini Lall. Basic Technical Communication. Cambridge University Press, 2009.
Hoover, Hardy. Essentials for the Scientific and Technical Writer. 1970; Rpt. New York: Dover Publications, Inc., 1980
Kirkman, John. Good Style for Scientific and Engineering Writing. London: Pitman Publishing Ltd., 1980.



<p>Extra-Disciplinary Paper 2 - THEATRE FOR COMMUNICATION</p> <p>Course Outcomes</p> <p>CO1: Comprehend the importance of body language in communication CO2: Apply voice modulation, pronunciation and proper intonation while speaking and reading CO3: Effectively communicate ideas CO4: Develop scripts for short scenes CO5: Equipping articulating skill</p> <p>Learning Objectives</p> <p>To use theatre as a tool to develop both verbal and non-verbal skills and enhance and strengthen communication skills.</p> <p>To promote inter-group communication, self-development and boost confidence in students in a fun and relaxed environment.</p> <p>Unit I Introduction to Theatre Script Reading To practice intonation, pronunciation and word stress Voice modulation to convey different feelings and emotions</p> <p>Unit II Script writing Developing scripts for short scenes Developing dialogues to convey ideas clearly and effectively</p> <p>Unit III Acting Role play & enacting a scene</p> <p>Unit IV Use of the body, gestures and expressions Creating tableau , Mime</p> <p>Unit V Production Students should produce a 15-minutes play (Each group of students must choose a play for production for their final assessment)</p> <p>Reference Books: Dunsick, Rosemary. From Theatre to Communication: The Application of Theatre Techniques to an Orientation Program for Overseas Students. University of Melbourne, 1994.</p>
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Dept of Social work

<u>S.No</u>	Name of the Course (as per the curriculum)
1	FIELD WORK I
2	Field Work II
3	Field Work III
5	Field Work
6	Field Work

**Core Paper – II - FIELD WORK - I****LAB SESSIONS AND OBSERVATION VISITS**

These are structured experiences in a skill lab setting, which provide an opportunity of “learning by doing” in a safe environment. Learning about social realities, others and self is essentially through inputs, group experiences and simulation games. The skill lab sessions equip students with knowledge, attitudes and practice skills in keeping with social work values, beliefs and ethics. The students are exposed to social realities existing in society, a critical analysis of such situations and the need to work towards human development.

The observation visits aim to make the students oriented to various organisation in the field of social work, such as non-governmental organisations involved in welfare and development activities, government bodies involved in development work, hospitals and health care organisations, organisations in the care of aged, women and children

6

OBJECTIVES OF FIELD WORK

- To develop understanding of situations in the world of reality through experiencing situations in a laboratory settings, using imagination and fantasy.
- To develop the capacity to reflect over one's own behaviour, and its effect on self and others and with the help of the facilitator, develop understanding of the same.
- To develop skills to establish relationship with clients and client groups by participating in games for listening, verbal communication and understanding non-verbal messages – body language and life skills.
- To acquire skills of observation and develop an understanding of society's response to social problems through various services.
- To develop understanding and appreciation and ability to critically evaluate the efforts of voluntary and government programmes.
- To develop an appreciation of the significances of social work intervention in these programmes by recording.

The topics for field Lab Sessions:

- a. Self-Awareness
- b. Communication skills
- c. Interpersonal relationship.
- d. Indian social problems
- e. Values and ethics in Social Work.
- f. Leadership and personality development.

**Core Paper – IV - FIELD WORK - II****LAB SESSIONS AND OBSERVATION VISITS**

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These are structured experiences in a skill lab setting, which provide an opportunity of “learning by doing” in a safe environment. Learning about social realities, others and self is essentially through inputs, group experiences and simulation games. The skill lab sessions equip students with knowledge, attitudes and practice skills in keeping with social work values, beliefs and ethics. The students are exposed to social realities existing in society, a critical analysis of such situations and the need to work towards human development.



The observation visits aim to make the students oriented to various organisation in the field of social work, such as non-governmental organisations involved in welfare and development activities, government bodies involved in development work, hospitals and health care organisations, organisations in the care of aged, women and children

OBJECTIVES OF FIELD WORK

- To develop understanding of situations in the world of reality through experiencing situations in a laboratory settings, using imagination and fantasy.
- To develop the capacity to reflect over one's own behaviour, and its effect on self and others and with the help of the facilitator, develop understanding of the same.
- To develop skills to establish relationship with clients and client groups by participating in games for listening, verbal communication and understanding non-verbal messages – body language and life skills.
- To acquire skills of observation and develop an understanding of society's response to social problems through various services.
- To develop understanding and appreciation and ability to critically evaluate the efforts of voluntary and government programmes.
- To develop an appreciation of the significances of social work intervention in these programmes by recording.

The topics for field Lab Sessions:

- g. Reality walk – meeting various people and understanding reality life situations.
- h. The City slums through an NGO involved in developmental work.
- i. Time Management
- j. Societal Analysis
- k. Stress Management and Problem Solving

Core Paper – VI - FIELD WORK – III

RURAL CAMP AND CONCURRENT FIELD WORK

The students will attend the rural camp before concurrent Field Work begins. The broad aim of Field Work is to provide opportunities for students to apply the knowledge learnt in the classroom situations and to plan, implement and evaluate these experiences while working with individuals, groups and communities. These will be in keeping with the placement agency's philosophy, policy and goals and use of guided supervision.

OBJECTIVES OF FIELD WORK

- To develop an understanding of the rural social system with special reference to a specific poverty group
- To develop an understanding of government intervention in relation to poverty groups in the region and the related structures of decision-making and intervention
- To develop the capacity to appreciate and make a critical analysis of interventions of both voluntary organisation and the government agencies
- To experience in-group living, appreciate its value in terms of self-development, interpersonal relationships, sense of organisation, management and mutual responsibility
- To acquire skills in planning, organising, implementing the camp
- To understand the organisation, its philosophy and goals and to prepare an organisation's profile
- To understand the community, the needs and problems of the communities by preparing a community profile
- To analyse the organisations' structure, functioning and its networking strategies

**Core Paper – VIII - FIELD WORK - IV****CONCURRENT FIELD WORK**

The broad aim of Field Work is to provide opportunities for students to apply the knowledge learnt in the classroom situations and to plan, implement and evaluate these experiences while working with individuals, groups and communities. These will be in keeping with the placement agency's philosophy, policy and goals and use of guided supervision.

OBJECTIVES OF FIELD WORK

- To develop an understanding and sensitivity towards the needs and problems of individuals and families
- To identify 3 cases and draw up a face sheet
- To draw up a family profile of two families
- To execute simple referrals
- To identify groups in existence and study the functions/ activities of the group
- To conduct a group activity with any one existing group in the community
- To visit and interact with different groups that exists in the community (Youth, Women, Children and Senior Citizens).

METHODS OF ASSESSMENT

1. In relation to task and personal growth.
2. An internal viva voce will be conducted.

Dept of Marhs

<u>S.No</u>	Name of the Course (as per the curriculum)
1	Statistics

**CORE PAPER- VIII - STATICS****Learning outcomes:**

Students will acquire knowledge about

- Particles or body in rest under the given forces.
- Forces, equilibrium of a particle and centre of mass of various bodies.

Unit 1

Force- Newtons laws of motion - resultant of two forces on a particle- Equilibrium of a particle
Chapter 2 - Section 2.1, 2.2, Chapter 3 - Section 3.1.

Unit 2

Forces on a rigid body – moment of a force – general motion of a rigid body- equivalent systems of forces – parallel forces – forces along the sides of a triangle – couples
Chapter 4 - Section 4.1 to 4.6.

Unit 3

Resultant of several coplanar forces- equation of the line of action of the resultant- Equilibrium of a rigid body under three coplanar forces – Reduction of coplanar forces into a force and a couple.- problems involving frictional forces
Chapter 4 - Section 4.7 to 4.9,
Chapter 5 - Section 5.1, 5.2.

Unit 4

Centre of mass – finding mass centre – a hanging body in equilibrium
Chapter 6 - Section 6.1 to 6.3.

Unit 5

Hanging strings- equilibrium of a uniform homogeneous string – suspension bridge
Chapter 9 - Section 9.1, 9.2.

Dept of Psychology

S.No	Name of the Course (as per the curriculum)
1	Skill Enhancement Course SEC-6 Psychological Therapy Techniques
2	: Assessments in Psychology (Practical)-
3	Internship / Industrial Training
4	Professional Competency Skill - Psychological Testing and Report Writing
5	PSYCHOLOGICAL FIRST AID
6	RELAXATION TECHNIQUES



1	Psychological Interventions for Developmental Disorders
2	Psychological Assessment - I
3	Psychotherapy
4	Psychological Training Module
5	Scientific Report writing
6	Dissertation with Viva Voce
7	Summer Internship
8	Psychological Assessment - II



Title of the Course		PSYCHOLOGICAL THERAPY TECHNIQUES					
Category	Skill Enhancement Course (Non Major Elective)	Year	I	Credits	2	Course Code	240S4A
		Semester	I/II				
Instructional Hours		Lecture	Tutorial	Lab Practice	Total		
Per week		2	--	--	2		
Course Outline		Unit: 1 Introduction to Art Therapy: Definition – Art, play Therapy, History, profession, ethics of Art & Play therapy, Scope of Art& Play Therapy					

	Unit:2 Basic approaches in art & Play Therapy, Steps in art therapy & play therapy Assessment, Treatment in the beginning phase, mid phase, & Termination, Characteristics of Art & Play Therapist Benefits of Art Therapy& Play Therapy
	Unit:3 Approaches to Art & Play Therapy: Psychoanalytic & Jungian approaches to Art & Play therapy, Humanistic approaches – Existentialism, Person- Centered, and Gestalt approaches to art & Play therapy.
	Unit :4 Art Therapy Techniques: Scribble technique, Free drawing, Drawing completion, conversational drawing, murals, zentangles, mandala, self-portraits, Emotion wheel.
	Unit:5 Play Therapy Techniques: Directive & Non Directive play therapy, creative visualization, storytelling, role playing, water & sand play, dance & creative movement.
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Text	Judith A. Rubin (2015). Introduction to Art Therapy: Sources & Resources (2nd edition). Routledge Taylor & Francis Group. Cathy A Malchiodi (2011). Handbook of Art Therapy /2nd

**CORE-VIII: PSYCHOLOGICAL ASSESSMENT****Instr.Hrs.: 6****Year : II****Credits : 4****Semester:
IV****Course Learning Outcome**

After completion of the Psychological assessment course, students will be able to:

1. Assess Personality, Aptitude & Interest and interpret the results
2. Measure and interpret achievement test, stress and coping levels
3. Select appropriate test to measure attitude, behavior & creativity and discuss the results

Concepts:

1. Personality
2. Aptitude
3. Interest

Title of the Course	PSYCHOLOGICAL TESTING AND REPORT WRITING 340S6A Sem 4
Course Outline	Conduct any four psychological assessments from the following areas and write a report. <ol style="list-style-type: none">1. Mental Status Examination (compulsory)2. Diverse groups3. Counseling4. Organizational5. Social issues6. Childhood screening tools
Recommended Text	Anastasi, A. & Urbina, S. (2017). Psychological Testing, Noida: Pearson.
Reference Books	Kaplan, R.M., & Saccuzzo, D.P. (2005). Psychological Testing: Principles, Applications, and Issues. Wadsworth, Cengage. TerLaak, J.J.F. (2013). Understanding Psychological Assessment: A Primer on the Global Assessment of the Client's Behavior in



Title of the Course		PSYCHOLOGICAL FIRST AID					
Category	Skill	Year	I	Credits	2	Course Code	140S2B
	Enhancement Course	Semester	II				
Instructional Hours Per week		Lecture	Tutorial		Lab Practice		Total
		2	--		--		2
Course Outline		Unit 1					

	Introduction to Psychological First Aid (PFA) - Concept and Development of PFA - Core Competencies of PFA
	Unit 2 The RAPID model (Reflective listening, Assessment of needs, Prioritization, Intervention, and Disposition)
	Unit 3 Four Basic Standards of Psychological First Aid - Goals of Psychological First Aid - Five Components of



		<p>Unit 4</p> <p>Self-Care - Practising Good Self-Care - Consequences of Poor Self-Care - Symptoms of Burnout - Vicarious Trauma - Helping Yourself During a Mental Health Crisis</p>
		<p>Unit 5</p> <p>Team Care – Seeking support - People Who Likely Need Special Attention - Evaluation</p>
	Recommended Text	<p>1. American Psychiatric Association. (1954). Psychological first aid in community disasters. Washington, DC: Author.</p> <p>2. Erskine, R. G. (2015). Relational Patterns, Therapeutic Presence : Concepts and Practice of Integrative Psychotherapy. London: Routledge.</p> <p>3. American Counseling Association. (2014). The ACA Encyclopedia of Counseling. Hoboken: American Counseling Association.</p>

Course Outcomes:

Title of the Course		RELAXATION TECHNIQUES					
Category	Skill Enhancement Course	Year	II	Credits	2	Course Code	240S3B
		Semester	III				
Instructional Hours Per week		Lecture	Tutorial		Lab Practice		Total
		2	-		-		2
Course Outline		UNIT I PROGRESSIVE MUSCULAR RELAXATION Physiology of relaxation - Progressive muscular relaxation - Steps to initiate progressive muscular relaxation - Benefit of progressive relaxation technique - Jacobsons relaxation technique (Practical experience to be given)					
		UNIT II MEDITATION Meditation – the inner and outer self - Definition, types of meditation – concentrative, receptive, reflective and generative - Benefits of meditation – (Practical experience to be given)					
		UNIT III DEEP BREATHING Deep breathing - steps involved in breathing techniques. Benefits, psychological effects of deep breathing - Effects of deep breathing on the brain (Practical experience to be given)					



	UNIT IV AUTOGENIC TRAINING Autogenic training – Definition, importance of the technique and 6 stages of autogenic training (Practical experience to be given)
	UNIT V GUIDED IMAGERY Guided imagery – definition, uses of guided imagery (Practical experience to be given)
Recommended Text	Lillian Nejad, Katerina Volny .[2008]. Relaxation techniques: Crown house publishing Michael Robertson, Relaxation techniques
Reference Books	Jay winner, Relaxation on the run – book scape Swaminathan V.D, Kalaippan.K.V.[2001]. Psychology for effective living: Angel printing house.

Course Name: PSYCHOLOGICAL INTERVENTION FOR DEVELOPMENTAL DISORDERS

Course Code: 418E1B

**Year and Semester: I
MSc**

OBJECTIVES:

On successful completion of syllabus students will be able to:

1. To introduce various Developmental Disorders
2. To understand the causal factors of childhood disorders.
3. To gain knowledge about the different types of assessment used in psycho diagnosis of childhood disorders.
4. To explain the psychological principles in management of childhood disorders.
5. To recommend suitable intervention strategies in hypothetical case studies.

LEARNING OUTCOMES: -

On successful completion the students will be able to :

CO1(K2): Describe the clinical picture of childhood disorders.



CO2(K2): Explain the causal factors and prevalence of childhood disorders. CO3(K3): Compare the diagnostic criteria of different childhood disorders.

CO4(K4): Identify the different types of psychological assessment of various childhood disorders.

CO5(K5): Apply various behavioural management and remedial education strategies for the different developmental disorders through hypothetical case discussions.

Unit- I: Intellectual Disability - Definition, classification, prevalence, etiology, early identification, interpersonal deficits, behavior problems and management. Common intellectual disability syndromes - hypothyroidism, Fragile X syndrome, Down's, William's, PKU.

Unit- II: Language and learning disabilities- Definition, prevalence, etiology – social and motivational factors. Assessment- tests of intelligence and cognitive abilities - underlying psychological and cognitive deficits. Treatment approaches- individualized educational program, remedial teaching.

Unit- III: Attention deficit hyperactivity disorder- Diagnostic criteria – co morbid factors - academic, social & conduct problems. Etiology - biological, family and social influences. Assessment -interviews, behavior rating scales. Treatment – medication, behavior modification, self-regulation and cognitive behavioral intervention.

Unit- IV: Anxiety and other Disorders - Generalized anxiety, separation anxiety, social phobias, school phobia, specific phobias, Obsessive Compulsive Disorder. Schizophrenia in children and adolescents. Childhood depression. Conduct disorder. habit disorders-treatment

Unit-V: Autism spectrum disorders- Prevalence, psychological and behavioral functioning, etiology, assessment, comprehensive educational treatment and behavioral intervention. Presentation of case formulation and recommend suitable intervention strategies in hypothetical cases.

Course Name: PSYCHOLOGICAL ASSESSMENT – I (Core V)

Course Code: 418C2B Year and Semester: 1st Year, 2nd sem

OBJECTIVES:

The major objectives of this course are:

1. To assist in the selection of appropriate tests.
2. To develop competence in Various types of Psychometric tests
3. To Administer psychological test according to the guidelines
4. To understand and interpret the person's test scores
5. To understand and solve the ethical issues in Psychological assessment.

LEARNING OUTCOMES:

On successful completion the students will be able to:

CO1(K2): Explain the conceptual framework of psychological testing. CO2(K2): Identify the appropriate psychological test

**Course Name: PSYCHOTHERAPY**

Course Code: 418E2B Year and Semester: 1ST
YEAR II Sem

OBJECTIVES:

The main objectives of the course are:

1. To gain an understanding of the different types of psychological therapies
2. To describe the application of psychological therapies.
3. To explain the process of psychotherapy
4. To understand the application of counseling and psychotherapy in groups and families.
5. To understand the procedures of certain alternative methods to psychotherapy

LEARNING OUTCOMES: -

On successful completion the students will be able to :

CO1(K2): Describe the basic concepts of different psychological therapies. CO2(K3): Examine the process of psychological therapies.
CO3(K4): Analyze skills and techniques used in specific groups/ problems. CO4(K5): Critically evaluate psychological therapies for specific groups/ problems. CO5(K5): Recommend suitable strategies to be used in hypothetical cases.

Unit- I: Psychotherapy formulation- Definition, types and purpose of formulation. Structured case formulation methods. Therapeutic process: transference, counter

Unit- II: Group counselling and group therapy: definition – assumptions underlying group work, Historical perspective of group counselling and therapy – group dynamics and development, Therapeutic factors – Process and outcome in group counselling and psychotherapy - ethical issues in therapeutic group work.

Unit- III: Family therapy: Family therapies that focus on background- Adlerian family therapy, multigenerational family therapy, Structural family therapy. Family therapies that focus on emotions, Emotionally focused couples therapy- Experiential family therapy. Skill development: genograms.

Unit- IV: Supportive Psychotherapy –objectives, indications and contraindications. Supportive measures: Application of psychotherapy in certain areas : Psychotherapy for Obsessive Compulsive Disorder, personality disorders, post- traumatic stress disorder and psychoses

Unit- V: Alternatives to counselling and psychotherapy: Eye movement desensitization therapy, Mindfulness based therapy, Neuro linguistic programming, Yoga therapy and Art Therapy. Method: Workshops to be organized by experts on these topics.

Recap: Conducting quiz, class test, assigning students to do review sessions, "Question hour"

Learning resources:

**Elective VI -INDUSTRIAL MODULE****Course Name: PSYCHOLOGICAL TRAINING MODULE****Course Code: 518E4A Year and Semester: II
& 4****OBJECTIVES:****Major objectives of this course are:**

1. To help students understand the method of preparing Psychological Training Modules using counseling techniques.
2. To design customized training module for various target groups
3. To utilize the psychological principles in constructing training module
4. To apply psychological interventions in bringing constructive change in thinking, affect and behavior
5. To help students acquire necessary skills to conduct Training Programmes

LEARNING OUTCOMES: -**On successful completion the students will be able to :**

1. Conduct needs assessment and prepare the concept background for the training programme.
2. Design a psychological training module with the detailed planning and structuring of a course to achieve specific instructional goals
3. Infer a better understanding of practical knowledge, skills and attitude to conduct training programmes.

**SELF-HELP SKILLS (Practical Oriented Teaching)**

1. Self-Awareness
2. Stress Management & Relaxation Training
3. Self-Concept, Self Esteem Skills
4. Assertiveness skills
5. Anger management
6. Diary keeping and self-analysis
7. Goal setting behaviors
8. Time management skills
9. Physical disciplines - Exercise, etc.
10. Reading skills
11. Coping with Complexity And ambiguity
12. Coping Emotions
13. Coping with failures
14. Creative thinking
15. Self-efficacy skills

INTERPERSONAL SKILLS (Practical Oriented Teaching)

1. Communication Skills (Styles)
2. Facilitation and Moderation Skills.
3. Conflict management
4. Problem solving and Decision Making
5. Motivation and Leadership Skills
6. Peer Counselling
7. Relationship Skills (also with reference to opposite sex and Martial relationship)



**Course Name: SCIENTIFIC REPORT WRITING (SEC III)
(Common to M.Sc. Applied**

Psychology (Counseling)) Course

Code: 518S4A

Year and Semester: 2nd Year 4th

Semester

The major objectives of this course are:

1. To describe the process of writing skills.
2. To apply Microsoft office features in preparing the reports.
3. To choose APA style in writing and publication of research papers.
4. To articulate how to write a research proposal.
5. To combine reports on various forms of qualitative and quantitative research methods.

LEARNING OUTCOMES:

On successful completion the students will be able to :

CO1(K2): Explain the process of writing skills. CO2(K3): Practice Microsoft office.

CO3(K4): Apply APA style in writing and publication of research papers. CO4(K4): Articulate how to write a research proposal.



Unit- I: Written Communication – basics, parts of written communication, punctuation, common grammatical errors; spelling, commonly confused words, gender; Style – flow of writing, making writing lively, use of style in writing sentences and paragraphs.

Unit- II: Manuscript writing – critical appraisal using journal articles, review of literature, writing and publication of research papers

Unit- III: The process of writing- Audience analysis, planning, collecting relevant materials, organizing ideas; specific writing situations and writing.

Unit- IV: Plagiarism - Software for grammar and plagiarism check.

Unit- V: APA style –Basics of APA, in-text citations, formatting and writing Reference.

Recap: Required portions of the units may be presented by the course faculty giving life examples from published research to explain the different publishing styles .

Course Code: 518C4C Year and Semester: 2nd Year, 4th Semester

OBJECTIVES:

Major objectives of this course are:

1. Identify the research problem on the basis of relevant literature review
2. Adopt appropriate research design to undertake the research study
3. Apply research methodology in selection of sample, finalization of tools for research
4. Collect data and analyze the results
5. Present the research work in the form of dissertation

LEARNING OUTCOMES: -

On successful completion the students will be able to :

CO1(K2): Identify gap in knowledge in existing literature

CO2(K3): Apply appropriate sampling techniques and research design
CO3(K2): Choose appropriate psychological tools for data collection
CO4(K6): Design an research plan and carry out a independent research
CO5(K6): Prepare a research report



Unit- I: Introduction :

- 1.1. Conceptual Framework / Theoretical Framework
- 1.2. Need of the study

Unit- II: Review of Related Literature (Last ten years)

- 2.1. Introduction (Brief)
- 2.2. Studies on variables, sample and related variables and samples
- 2.3. Critical analysis of reviews collected

Unit- III: Method of Investigation

- 3.1 Introduction
- 3.2 Statement of the Problem

Unit- III: Method of Investigation

- 3.1 Introduction
- 3.2 Statement of the Problem

- 3.3 Objectives
- 3.4 Hypotheses
- 3.5 Research Design (Methodology)
- 3.6 Sample (Sample, Sample Size, Sampling technique & Delimitation)
- 3.7 Variables
- 3.8 Tools (Description of the Tools – Author(s), Year, Target Group, No of items, Scoring, Norms, Reliability & Validity)
- 3.9 Statistical techniques

**Unit- IV: Results and Discussion**

- 4.1 Introduction
- 4.2 Tables followed with discussion

Unit- V: Summary and Conclusion

- 5.1 Summary (one and half pages)
- 5.2 Findings
- 5.3 Suggestions & Recommendations
- 5.4 Implications
- 5.5 Conclusion

Course Name: PSYCHOLOGICAL ASSESSMENT – II (Core IX)

Course Code: 518C3C

Year and Semester: 2nd Year, 3rd Semester

OBJECTIVES: -**Main objectives of this Course are:**

1. To gain knowledge in assessment used at workplace
2. To familiarize with Psychometric properties of tests
3. To Administer psychological test according to the guidelines
4. To understand and interpret the person's test scores

5. To understand and solve the ethical issues in Psychological assessment.

LEARNING OUTCOMES:**On successful completion the students will be able to:**

CO1(K2): Explain the application of psychological testing at work place.

CO2 (K2): Identify the appropriate psychological test in recruiting and managing employees

CO3(K3): Determine how to discuss the obtained individual data and write a report CO4(K4): Evaluate the ethical issues in psychological testing.



1.3.2 Average Percentage of Courses that include experiential learning through Project work/field work/internship

Dept. of Computer Science with Data Science

List of Experiential learning courses -2023-2024

S.No	Name of the Course	Course Code
1	Environmental Studies	ENV4A
2	Python Programming	127C1A
3	Python Programming Practical	127C11
4	SEC- I: Office Automation @#\$\$%&	127S1A
5	FC: Fundamentals of Computers	127B1A
6	Java Programming	127C2A
7	Java Programming Practical	127C21
8	SEC-II: Office Automation Practical	127S21

Syllabus

Year: I

Semester:I

Foundation Course: Fundamentals of Computers (Common to B.Sc.-CS, CS with AI, Software Appl. & BCA)	127B1 A
Credits 2 week	Lecture Hours:2 per
Learning Objectives: (for teachers: what they have to do in the class/lab/field) <ul style="list-style-type: none">• to understand fundamentally the general scope of the computer system• to interact effectively with the computer• to know the uses of the basic components of the computer• to manage the system to some extent before involving an expert• to know some basic things about the computer and the world	
Course Outcomes: (for students: To know what they are going to learn) CO1: Fundamental concepts of computer CO2: Fundamental mathematical techniques and how they relate to computer CO3: The architecture of processing and file storage in a computer system CO4: Basic operations of operating systems CO5: A variety of software packages applicable to an academic, software development and business environment	

Units	Contents
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I	Understanding the Computer: - Introduction - Evolution of Computers - Generations of Computers - Classification of Computers - Computing Concepts - The Computer System - Applications of Computers. Computer Organisation and Architecture: - Introduction - Central Processing Unit - Internal Communications - Machine Cycle - The Bus - Instruction Set. Memory and Storage Systems: - Introduction - Memory Representation - Random Access Memory - Read Only Memory - Storage Systems - Magnetic Storage Systems - Optical Storage Systems - Magneto Optical Systems - Solid-state Storage Devices - Storage Evaluation Criteria. Input Devices: - Introduction - Keyboard - Pointing Devices - Scanning Devices - Optical Recognition Devices - Digital Camera - Voice Recognition System - Data Acquisition Sensors - Media Input Devices. Output Devices: - Introduction - Display Monitors - Printers - Impact Printers - Non-impact Printers - Plotters - Voice Output - Systems - Projectors - Terminals
II	Computer Codes: - Introduction - Decimal System - Binary System - Hexadecimal System - Octal System - Binary Coded Decimal (BCD) Systems – Unicode. Computer Arithmetic: - Introduction - Binary Addition - Binary Multiplication - Binary Subtraction - Binary Division - Signed/unsigned Numbers - Complements of Binary Numbers - Binary Subtraction Using Complements - Representing Numbers - Integer Arithmetic - Floating-point Arithmetic



III	Boolean Algebra of Switching Circuits: - Introduction - Elements of Boolean Algebra - Basic Postulates of Boolean Algebra - Boolean Operations - Principle of Duality - Basic Laws of Boolean Algebra - De Morgan's Theorem - Boolean Expressions. Logic Gates and Digital Circuits: - Introduction - Basic Logic Gates - Derived Logic Gates - Conversion of Boolean Functions - Adder Circuits - Flip-flop Circuits - Application of Flip-flops. Computer Software: - Introduction - Types of Computer Software - System Management Programs - System Development Programs - Standard Application Programs - Unique Application Programs - Problem Solving - Structuring the Logic - Using the Computer
IV	Operating Systems: - Introduction - History of Operating Systems - Functions of Operating Systems - Process Management - Memory Management - File Management - Device Management - Security Management - Types of Operating Systems - Providing User Interface - Popular Operating Systems. Programming Languages: - Introduction - History of Programming Languages - Generations of Programming Languages - Characteristics of a Good Programming Language - Categorisation of High-level Languages - Popular High-level Languages - Factors Affecting the Choice of a Language - Developing a Program - Running a Program
V	Data Communications and Networks: - Introduction - Data Communication Using Modem - Computer Network - Network Topologies - Network - Protocols and Software - Applications of Network. The Internet and World Wide Web: - Introduction - History of Internet - Internet Applications - Understanding the World Wide Web - Web Browsers - Browsing the internet - Using a Search Engine - Email Service - Protocols Used for the Internet

Learning Resources:
Recommended Texts

- E Balagurusamy. Fundamentals Of Computers, Tata McGraw Hill Publishing Company Limited
- Fundamentals of Computers (Paperback), 2019, Manaulah Abid, Mohammad Amjad, Dreamtech Press

2. Year: I

Semester: I

Core-I: Python Programming (Common to B.Sc.-CS, CS with AI, Software Appl. & BCA)	127C1A
Credits 5	
Lecture Hours: 4 per week	
Learning Objectives: (for teachers: what they have to do in the class/lab/field) <ul style="list-style-type: none"> ● Describe the core syntax and semantics of Python programming language. ● Discover the need for working with the strings and functions. ● Illustrate the process of structuring the data using lists, dictionaries, tuples and sets. 	



- Understand the usage of packages and Dictionaries

Course Outcomes: (for students: To know what they are going to learn)

CO1: Develop and execute simple Python programs

CO2: Write simple Python programs using conditionals and looping for solving problems

CO3: Decompose a Python program into functions

CO4: Represent compound data using Python lists, tuples, dictionaries etc.

CO5: Read and write data from/to files in Python programs

UNITS	CONTENTS
I	Introduction: The essence of computational problem solving – Limits of computational problem solving-Computer algorithms-Computer Hardware-Computer Software-The process of computational problem solving-Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types, Input / output.
II	Control Structures: Boolean Expressions - Selection Control - If Statement-Indentation in Python- Multi-Way Selection -- Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flag. String, List and Dictionary, Manipulations Building blocks of python programs, Understanding and using ranges.
III	Functions: Program Routines- Defining Functions- More on Functions: Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python - Default Arguments in Python-Variable Scope. Recursion: Recursive Functions.
IV	Objects and their use: Software Objects - Turtle Graphics – Turtle attributes- Modular Design: Modules - Top-Down Design - Python Modules - Text Files: Opening, reading and writing text files – Exception Handling.
V	Dictionaries and Sets: Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism. Python packages: Simple programs using the built-in functions of packages matplotlib, NumPy, pandas etc.

**Learning Resources:****Recommended Texts**

1. Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem-solving Focus", Wiley India Edition, 2015.
2. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education, 2016

Reference Books

1. Mark Lutz, "Learning Python Powerful Object Oriented Programming", O'reilly Media 2018, 5th Edition.
2. Timothy A. Budd, "Exploring Python", Tata McGraw Hill Education Private Limited 2011, 1 st Edition.
3. John Zelle, "Python Programming: An Introduction to Computer Science", Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410
4. Michel Dawson, "Python Programming for Absolute Beginners", Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-143545500

Web resources

1. https://onlinecourses.swayam2.ac.in/cec22_cs20/preview

Year: I**Semester:I**

Core-II: Python Programming Practical (Common to B.Sc.-CS, CS with AI, Software Appl. & BCA)	127C11
Credits 5	Lecture Hours:5 per week



Learning Objectives: (for teachers: what they have to do in the class/lab/field)

- Acquire programming skills in core Python.
- Acquire Object-oriented programming skills in Python.
- Develop the skill of designing graphical-user interfaces (GUI) in Python.
- Develop the ability to write database applications in Python.
- Acquire Python programming skills to move into specific branches

Course Outcomes: (for students: To know what they are going to learn)

CO1: To understand the problem solving approaches

CO2: To learn the basic programming constructs in Python

CO3: To practice various computing strategies for Python-based solutions to real world problems

CO4: To use Python data structures - lists, tuples, dictionaries.

CO5: To do input/output with files in Python.

List of Programs

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Write a Python program to construct the following pattern, using a nested loop

```

*
**
***
****
*****
****
***
**
*
```
3. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70 Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
4. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
5. Write a Python script that prints prime numbers less than 20.



- Program to find factorial of the given number using recursive function.
- Write a Python program to count the number of even and odd numbers from array of N numbers.
- Write a Python class to reverse a string word by word.
- Given a tuple and a list as input, write a program to count the occurrences of all items of the list in the tuple. (Input: tuple = ('a', 'a', 'c', 'b', 'd'), list = ['a', 'b'], Output: 3)
- Create a Savings Account class that behaves just like a Bank Account, but also has an interest rate and a method that increases the balance by the appropriate amount of interest (Hint: use Inheritance).
- Read a file content and copy only the contents at odd lines into a new file.
- Create a Turtle graphics window with specific size.
- Write a Python program for Towers of Hanoi using recursion
- Create a menu driven Python program with a dictionary for words and their meanings.
- Devise a Python program to implement the Hangman Game.

Learning Resources:**Recommended Texts**

- Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem-solving Focus”, Wiley India Edition, 2015.
- Wesley J. Chun, “Core Python Applications Programming”, 3rd Edition , Pearson Education, 2016

Reference Books

- Mark Lutz, “Learning Python Powerful Object Oriented Programming”, O’reilly Media 2018, 5th Edition.
- Timothy A. Budd, “Exploring Python”, Tata McGraw Hill Education Private Limited 2011, 1 st Edition.
- John Zelle, “Python Programming: An Introduction to Computer Science”, Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410
- Michel Dawson, “Python Programming for Absolute Beginners”, Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1435455009

4. Year: I**Semester: II**

Java Programming Practical Common for B.C.A. , B.Sc.-SA , B.Sc.-CSc , B.Sc.-CSc-wAI , B.Sc.-CSc-wDS		127C21
Credits 5	Lecture Hours:5 per week	



Learning Objectives: (for teachers: what they have to do in the class/lab/field)

- To gain practical expertise in coding Core Java programs
- To become proficient in the use of AWT, Event Handling and Swing.

Course Outcomes: (for students: To know what they are going to learn)

CO1: Code, debug and execute Java programs to solve the given problems

CO2: Implement multi-threading and exception-handling

CO3: Implement functionality using String and StringBuffer classes

CO4: Demonstrate Event Handling.

CO5: Create applications using Swing and AWT

List of Programs

1. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer?
2. Write a Java program to multiply two given matrices.
3. Write a Java program that displays the number of characters, lines and words in a text?
4. Generate random numbers between two given limits using Random class and print messages according to the range of the value generated.
5. Write a program to do String Manipulation using Character Array and perform the following string operations:
 - a) String length
 - b) Finding a character at a particular position
 - c) Concatenating two strings
6. Write a program to perform the following string operations using String class:
 - a) String Concatenation
 - b) Search a substring
 - c) To extract substring from given string
7. Write a program to perform string operations using StringBuffer class:
 - a) Length of a string
 - b) Reverse a string
 - c) Delete a substring from the given string
8. Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.



9. Write a threading program which uses the same method asynchronously to print the numbers 1 to 10 using Thread1 and to print 90 to 100 using Thread2.
10. Write a program to demonstrate the use of following exceptions.
 - a) Arithmetic Exception
 - b) Number Format Exception
 - c) Array Index Out of Bound Exception
 - d) Negative Array Size Exception
11. Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes?
12. Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls.
13. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired. (Use adapter classes).
14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.
15. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with “stop” or “ready” or “go” should appear above the buttons in a selected color. Initially there is no message shown.

Learning Resources:**Recommended Texts**

Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010. Gary Cornell, Core Java 2 Volume I – Fundamentals, Addison Wesley, 1999.

Reference Books

Head First Java, O’Rielly Publications, Y. Daniel Liang, Introduction to Java Programming, 7th Edition, Pearson Education India, 2010.

Web resources: Web resources from NDL Library, E-content from open-source libraries

Year: I**Semester: I****Skill Enhancement Course: Office Automation**

(Common to B.Sc.-CS, CS with AI, Software Appl. & BCA)

127S1A



Credits 2	Lecture Hours:2 per week
Learning Objectives: (for teachers: what they have to do in the class/lab/field) <ul style="list-style-type: none">• The major objective in introducing the Computer Skills course is to impart training for students in Microsoft Office which has different components like MS Word, MS Excel and Power point.• The course is highly practice oriented rather than regular class room teaching.• To acquire knowledge on editor, spread sheet and presentation software.	
Course Outcomes: (for students: To know what they are going to learn) CO1: Understand the basics of computer systems and its components. CO2: Understand and apply the basic concepts of a word processing package. CO3: Understand and apply the basic concepts of electronic spreadsheet software. CO4: Understand and apply the basic concepts of database management system. CO5: Understand and create a presentation using PowerPoint tool.	

UNITS	CONTENTS
I	Introductory concepts: Hardware and Software - Memory unit – CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems - Introduction to Programming Languages.
II	Word Processing: File menu operations - Editing text – tools, formatting, bullets and numbering - Spell Checker - Document formatting – Paragraph alignment, indentation, headers and footers, printing – Preview, options, merge.
III	Spreadsheets: Excel – opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying
IV	Charts – creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.
V	Power point: Introduction to Power point - Features – Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition – Animation effects, audio inclusion, timers.

Learning Resources:**Recommended Texts**

1. Peter Norton, “Introduction to Computers” –Tata McGraw-Hill.

Reference Books

1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, “Microsoft 2003”, Tata McGraw- Hill.

Web resources : Web content from NDL / SWAYAM or open source web resources

Year: I**Semester: II**

Quantitative Aptitude	127S2A
Common for B.C.A. , B.Sc.-SA , B.Sc.-CSc , B.Sc.-CSc-wAI , B.Sc.-CSc-wDS	



Credits 2	Lecture Hours: 2 per week
Learning Objectives: (for teachers: what they have to do in the class/lab/field) To improve the quantitative skills of the students To prepare the students for various competitive exams	
Course Outcomes: (for students: To know what they are going to learn) CO1: To gain knowledge on LCM and HCF and its related problems CO2: To get an idea of age, profit and loss related problem solving. CO3: Able to understand time series simple and compound interests CO4: Understanding the problem related to probability, and series CO5: Able to understand graphs, charts	

Units	Contents
I	Numbers - HCF and LCM of numbers - Decimal fractions - Simplification - Square roots and cube roots - Average - problems on Numbers
II	Problems on Ages - Surds and Indices - percentage - profits and loss - ratio and proportion - partnership - Chain rule.
III	Time and work - pipes and cisterns - Time and Distance - problems on trains - Boats and streams - simple interest - compound interest - Logarithms - Area - Volume and surface area - races and Games of skill.
IV	Permutation and combination - probability - True Discount - Bankers Discount - Height and Distances - Odd man out & Series.
V	Calendar - Clocks - stocks and shares - Data representation - Tabulation - Bar Graphs - Pie charts - Line graphs

Learning Resources: Recommended Texts 1. "Quantitative Aptitude", R.S. AGGARWAL., S. Chand & Company Ltd., Web resources: Authentic Web resources related to Competitive examinations

7.

Year: I	Semester: II
Office Automation Practical Common for B.C.A. , B.Sc.-SA , B.Sc.-CSc-wAI , B.Sc.-CSc-wDS	127S21
Credits 2	Lecture Hours:2 per week

**Learning Objectives:** (for teachers: what they have to do in the class/lab/field)

- The major objective in introducing the Computer Skills course is to impart training for students in Microsoft Office which has different components like MS Word, MS Excel and Power point.
- The course is highly practice oriented rather than regular class room teaching.
- To acquire knowledge on editor, spread sheet and presentation software.

Course Outcomes: (for students: To know what they are going to learn)

CO1: Understand the basics of computer systems and its components.

CO2: Understand and apply the basic concepts of a word processing package.

CO3: Understand and apply the basic concepts of electronic spreadsheet software.

CO4: Understand and apply the basic concepts of database management system.

CO5: Understand and create a presentation using PowerPoint tool.

Contents**WORD**

1. Create and save a document using MSWORD

Deletion of Character, Word, line and block of text - Undo and redo process - Moving, Copying and renaming

2. Format the Text document

Character formatting - Paragraph formatting - Page formatting

3. Spell check the document

Finding and Replacing of text - Bookmarks and Searching for a Bookmarks - Checking Spelling and Grammar automatically - Checking Spelling and Grammar using Dictionary

4. Print the document

Print Preview - Print Dialog box

5. Mail Merge in Ms-word

Create main document and data file for mail merging - Merging the files - From letters using mail merging - Mailing labels using mail merging

6. Table creation in Ms-word

Create a table in the document - Add row, column to a table - Changing column width and row height - Merge, split cells of table - Use formulae in tables - Sorting data in a table - Formatting a table.

EXCEL

1. Create and save a new work book in Excel
2. Entering Data into Work sheet
3. Editing data of Worksheet
4. Formatting the text in the cells
5. Formatting the numbers in the cells.



- Formatting cells.
- Copying format of cell along with data format.
- Changing the height and width of cells.
- Freezing Titles, splitting screen
- Enter formulae for calculation in the cells.
- Copying the formula over a range of cells.
- Inserting built-in functions in to the cells.
- Create graphs for the data using ChartWizard.
- Format graphs in Excel.
- Printing of work sheet. POWER POINT
- Create and save a new presentation using MS Power Point
 - layout of opening screen in PowerPoint
 - the tool bars in MS PowerPoint
- Choose Auto Layout for a new slide.
- Insert text and pictures into a blank slide.
- Insert new slides into the presentation.
- Apply slide transition effects.
- Slide show.

Set animation to text and pictures in a slide - Set the sounds, order and timing for animation

Learning Resources:**Learning Resources:****Recommended Texts**

1. Peter Norton, "Introduction to Computers" –Tata McGraw-Hill.

Reference Books

1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, "Microsoft 2003", Tata McGraw- Hill.

Web resources : Web content from NDL / SWAYAM or opensource web resources



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSC14

CORE-XIV: SOFTWARE ENGINEERING
(Common paper to B.Sc. Software Applications-V Sem. & B.C.A.-V Sem.)

III YEAR / VI SEM

OBJECTIVES:

- To introduce the software development life cycles
- To introduce concepts related to structured and object oriented analysis & design
- To provide an insight into UML and software testing techniques

OUTCOMES:

- The students should be able to specify software requirements, design the software using tools
- To write test cases using different testing techniques.

UNIT- I

Introduction – Evolution – Software Development projects – Emergence of Software Engineering.
Software Life cycle models – Waterfall model – Rapid Application Development – Agile Model – Spiral Model

UNIT- II

Requirement Analysis and Specification – Gathering and Analysis – SRS – Formal System Specification

UNIT- III

Software Design – Overview – Characteristics – Cohesion & Coupling – Layered design – Approaches
Function Oriented Design – Structured Analysis – DFD – Structured Design – Detailed design

UNIT- IV

Object Modeling using UML – OO concepts – UML – Diagrams – Use case, Class, Interaction, Activity, State Chart – Postscript

UNIT- V

Coding & Testing – coding – Review – Documentation – Testing – Black-box, White-box, Integration, OO Testing, Smoke testing.

TEXT BOOK:

1. Rajib Mall, "Fundamentals of Software Engineering", PHI 2018, 5th Edition.

REFERENCE BOOKS:

1. Roger S. Pressman, "Software Engineering - A Practitioner's Approach", McGraw Hill 2010, 7th Edition.
2. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa Publishing House 2011, 3rd Edition.

WEB REFERENCES:



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSC10

CORE-X: OPERATING SYSTEM

(Common paper to B.Sc. Software Applications & B.C.A.)

III YEAR / V SEM

OBJECTIVES:

- To understand the fundamental concepts and role of Operating System.
- To learn the Process Management and Scheduling Algorithms
- To understand the Memory Management policies
- To gain insight on I/O and File management techniques

OUTCOMES:

- Understand the structure and functions of Operating System
- Compare the performance of Scheduling Algorithms
- Analyze resource management techniques

UNIT - I

Introduction: Views - Types of System - OS Structure - Operations - Services - Interface- System Calls- System Structure - System Design and Implementation. Process Management: Process - Process Scheduling - Inter-process Communication. CPU Scheduling: CPU Schedulers - Scheduling Criteria - Scheduling Algorithms.

UNIT - II

Process Synchronization: Critical- Section Problem - Synchronization Hardware Semaphores - Classical Problems of Synchronization - Monitors. Deadlocks: Characterization - Methods for Handling Deadlocks - Deadlock Prevention - Avoidance - Detection - Recovery.

UNIT - III

Memory Management: Hardware - Address Binding - Address Space - Dynamic Loading and Linking - Swapping - Contiguous Allocation - Segmentation - Paging - Structure of the Page Table.

UNIT - IV

Virtual Memory Management: Demand Paging - Page Replacement Algorithms - Thrashing. File System: File Concept - Access Methods - Directory and Disk Structure - Protection - File System Structures - Allocation Methods - Free Space Management.

UNIT - V

I/O Systems: Overview - I/O Hardware - Application I/O Interface - Kernel I/O Subsystem - Transforming I/O Requests to Hardware Operations - Performance. System Protection: Goals - Domain - Access matrix. System Security: The Security Problem - Threats - Encryption- User Authentication.

TEXT BOOK:

1. Abraham Silberschatz, Peter B Galvin, Greg Gagne, "Operating System Concepts", Wiley India Pvt. Ltd 2018, 9th Edition.

REFERENCES:

1. William Stallings, "Operating Systems Internals and Design Principles", Pearson, 2018, 9th Edition.
2. Andrew S. Tanenbaum, Herbert Bos, "Modern Operating Systems", Pearson 2014, 4th Edition.

WEB REFERENCES:



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSC11

CORE-XI: RELATIONAL DATABASE MANAGEMENT SYSTEM

(Common paper to B.Sc. Software Applications & B.C.A.)

III YEAR / V SEM

OBJECTIVES:

- Gain a good understanding of the architecture and functioning of Database Management Systems
- Understand the use of Structured Query Language (SQL) and its syntax.
- Apply Normalization techniques to normalize a database.
- Understand the need of transaction processing and learn techniques for controlling the consequences of concurrent data access.

OUTCOMES:

- Describe basic concepts of database system
- Design a Data model and Schemas in RDBMS
- Competent in use of SQL
- Analyze functional dependencies for designing robust Database

UNIT - I

Introduction to DBMS – Data and Information - Database – Database Management System – Objectives
- Advantages – Components - Architecture. ER Model: Building blocks of ER Diagram –
Relationship Degree – Classification – ER diagram to Tables – ISA relationship – Constraints –
Aggregation and Composition – Advantages

UNIT - II

Relational Model: CODD's Rule- Relational Data Model - Key - Integrity – Relational Algebra
Operations – Advantages and limitations – Relational Calculus – Domain Relational Calculus -
QBE.

UNIT - III

Structure of Relational Database. Introduction to Relational Database Design - Objectives – Tools –
Redundancy and Data Anomaly – Functional Dependency - Normalization – 1NF – 2NF – 3NF –
BCNF. Transaction Processing – Database Security.

UNIT - IV

SQL: Commands – Data types – DDL - Selection, Projection, Join and Set Operations – Aggregate
Functions – DML – Modification - Truncation - Constraints – Subquery.

UNIT - V

PL/SQL: Structure - Elements – Operators Precedence – Control Structure – Iterative Control -
Cursors - Procedure - Function - Packages – Exceptional Handling - Triggers.

TEXT BOOK:

1. S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management System",
Springer International Edition 2007.



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSC12

CORE-XII: PRACTICAL – V (OPERATING SYSTEM LAB)
(Common paper to B.Sc. Software Applications & B.C.A.)

III YEAR / V SEM

OBJECTIVES:

- To learn Process management and scheduling.
- To understand the concepts and implementation of memory management policies.
- To understand the various issues in Inter Process Communication.

OUTCOMES:

- Understand the process management policies and scheduling process by CPU.
- Analyze the memory management and its allocation policies.
- To evaluate the requirement for process synchronization.

PROGRAM LIST:

1. Basic I/O programming.
To implement CPU Scheduling Algorithms:
2. Shortest Job First Algorithm.
3. First Come First Served Algorithm.
4. Round Robin and Priority Scheduling Algorithms.
5. To implement reader/writer problem using semaphore.
6. To implement Banker's algorithm for Deadlock avoidance.
Program for page replacement algorithms:
7. First In First Out Algorithm.
8. Least Recently Used Algorithm.
9. To implement first fit, best fit and worst fit algorithm for memory management.
10. Program for Inter-process Communication.



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSC13

CORE-XIII: PRACTICAL – VI (PL/SQL LAB)
(Common paper to B.Sc. Software Applications & B.C.A.)

III YEAR / V SEM

OBJECTIVES:

- Learn the various DDL and DML commands
- Understand queries in SQL to retrieve information from data base
- Understand PL/SQL statements: Exception Handling, Cursors, and Triggers.
- Develop database applications using front-end and back-end tools.

OUTCOMES:

- Implement the DDL , DML Commands and Constraints
- Create, Update and query on the database.
- Design and Implement simple project with Front End and Back End.

LIST OF EXERCISES

- 1) DDL commands with constraints.
- 2) DML Commands with constraints.
- 3) SQL Queries: Queries, sub queries, Aggregate function
- 4) PL/SQL : Exceptional Handling
- 5) PL/SQL : Cursor
- 6) PL/SQL : Trigger
- 7) PL/SQL : Packages
- 8) Design and Develop Application for Library Management
- 9) Design and Develop Application for Student Mark Sheet Processing
- 10) Design and Develop Application for Pay Roll Processing



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSE1A

ELECTIVE-I(A): PRINCIPLES OF INFORMATION SECURITY

III YEAR / V SEM

OBJECTIVES:

- To learn how to determine security requirements that mesh effectively with your business objectives, create policies that work for your organization and use technology to implement your policies.

OUTCOMES:

- Students should be able to understand the concepts of Information security, Laws, Control of Physical security, Authentication and Cryptography.

UNIT I

Why Information Security? Introduction - Growing IT Security Importance and New Career-Opportunities-Become an Information Security Specialist- Contextualizing Information Security-Information Security Principles of Success: Introduction - Twelve Principles.

UNIT II

Security Architecture and Models: Introduction-Defining the Trusted Computing Base-Protection Mechanisms in a Trusted Computing Base-System Security Assurance Concepts-Trusted Computer Security Evaluation Criteria.

UNIT III

Information Technology Security Evaluation Criteria: Federal Criteria for Information Technology Security-The Common Criteria-Confidentiality and Integrity Models. Law, Investigations and Ethics: Introduction-Types of Computer Crime-How Cyber Criminals Commit Crimes-The Computer and the Law-Intellectual Property Law-Privacy and the Law-Computer Forensics-The Information Security Professionals Code of Ethics.

UNIT IV

Physical Security Control: Introduction-Understanding the Physical Security Domain-Physical Security Threats – Providing Physical Security. Operations Security: Introduction-Operations Security Principles-Operations Security Process Controls-Operations Security Controls in Action.

UNIT V

Access Control Systems and Methodology: Introduction-Terms and Concepts- Principles of Authentication-Biometrics-Single Sign-On-Remote User Access and Authentication. Cryptography: Introduction-Applying Cryptography to Information Systems-Basic Terms and Concepts-Strength of Cryptosystems-Putting the Pieces to Work-Examining Digital Cryptography.



UNIVERSITY OF MADRAS
U.G. DEGREE COURSE

PART – IV - VALUE EDUCATION

Common for all U.G. & Five Year Integrated Courses
(Effective from the Academic Year 2012 – 2013)

SYLLABUS

CREDITS: 2

III YEAR / V SEM

Objective: Value are socially accepted norms to evaluate objects, persons and situations that form part and parcel of sociality. A value system is a set of consistent values and measures. Knowledge of the values are inculcated through education. It contributes in forming true human being, who are able to face life and make it meaningful. There are different kinds of values like, ethical or moral values, doctrinal or ideological values, social values and aesthetic values. Values can be defined as broad preferences concerning appropriate courses of action or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. There are representative values like, "Equal rights for all", "Excellence deserves admiration". "People should be treated with respect and dignity". Values tend to influence attitudes and behavior and help to solve common human problems. Values are related to the norms of a culture.

UNIT I: Value education-its purpose and significance in the present world – Value system – The role of culture and civilization – Holistic living – balancing the outer and inner – Body, Mind and Intellectual level – Duties and responsibilities.

UNIT II: Salient values for life – Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self esteem and self confidence, punctuality – Time, task and resource management – Problem solving and decision making skills – Interpersonal and Intra personal relationship – Team work – Positive and creative thinking.

UNIT III: Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr.A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

UNIT IV: Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment.

UNIT V: Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women – How to tackle them.



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSC18

CORE-XVIII: WEB DESIGN AND DEVELOPMENT

III YEAR / VI SEM

OBJECTIVES:

- To understand Web based programming and scripting languages.
- To learn the basic web concepts and to create rich internet applications that use most recent client-side programming technologies.
- To learn the basics of HTML, DHTML, XML, CSS, Java Script and AJAX.

OUTCOMES:

- Ability to Develop and publish Web pages using Hypertext Markup Language (HTML).
- Ability to optimize page styles and layout with Cascading Style Sheets (CSS).
- Ability to Understand, analyze and apply the role of languages to create a capstone
- Website using client-side web programming languages like HTML, DHTML, CSS, XML, JavaScript, and AJAX.

UNIT I:

HTML: HTML-Introduction-tag basics- page structure-adding comments working with texts, paragraphs and line break. Emphasizing text- heading and horizontal rules-list-font size, face and color-alignment-links-tables-frames

UNIT II:

Forms & Images Using Html: Graphics: Introduction-How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia, data collection with html forms textbox, password, list box, combo box, text area, tools for building web page front page

UNIT III:

XML & DHTML: Cascading style sheet (CSS)-what is CSS-Why we use CSS-adding CSS to your web pages-Grouping styles-extensible markup language (XML). Dynamic HTML: Document object model (DOM)-Accessing HTML & CSS through DOM Dynamic content styles & positioning-Event bubbling-data binding.

UNIT IV:

JavaScript : Client side scripting, What is JavaScript, How to develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition, Advance script, JavaScript and objects, JavaScript own objects, the DOM and web browser environments, forms and validations

UNIT V:

Ajax: Introduction, advantages &disadvantages, Purpose of it, ajax based web application, alternatives of ajax

Java Script & AJAX: Introduction to array-operators, making statements-date & time-mathematics-strings-Event handling-form properties. AJAX. Introduction to jQuery and AngularJS.

TEXT BOOKS:

1. Pankaj Sharma, "*Web Technology*", Sk Kataria & Sons Bangalore 2011.(UNIT I, II, III & IV).
2. Mike McCreath, "*Java Script*", Dream Tech Press 2006, 1st Edition. (UNIT V: JAVASCRIPT).



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSC19

CORE-XIX: DATA MINING

III YEAR / VI SEM

OBJECTIVES:

- To learn about data mining Concepts
- To study the different data mining techniques

OUTCOMES:

- To have knowledge in Data mining concepts
- To apply Data mining concepts in different fields

UNIT - I

Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

UNIT - II

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

UNIT - III

Classification: Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision.

UNIT - IV

Clustering Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms. Partitioned Algorithms.

UNIT - V

Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel & Distributed Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rules Techniques – Measuring the Quality of Rules.

TEXT BOOK:

1. Jiawei Han & Micheline Kamber, “Data Mining Concepts & Techniques”, 2011, 3rd Edition.

REFERENCE BOOK:

1. Margaret H.Dunham, “Data Mining Introductory and Advanced Topics”, Pearson Education 2003.

WEB REFERENCES:

- NPTEL & MOOC courses titled Data Mining
- <https://nptel.ac.in/courses/106105174/>



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSC20

CORE-XX: MOBILE APPLICATION DEVELOPMENT

III YEAR / VI SEM

OBJECTIVES:

- To make the student understand the basic concepts of mobile application development, be aware of Characteristics of mobile applications, User-interface design, basics of graphics and multimedia.
- To gain knowledge about testing and publishing of Android application

OUTCOMES:

- To explain the basics of mobile application development
- Develop Android application with User interface, networking and animation.
- Use simulator tools to test and publish the application.

UNIT - I

Mobile Application Development - Mobile Applications and Device Platforms - Alternatives for Building Mobile Apps -Comparing Native vs. Hybrid Applications -The Mobile Application Development Lifecycle-The Mobile Application Front-End-The Mobile Application Back-End-Key Mobile Application Services-What is Android-Android version history-Obtaining the Required Tools- Launching Your First Android Application-Exploring the IDE-Debugging Your Application-Publishing Your Application

UNIT - II

Understanding Activities-Linking Activities Using Intents-Fragments-Displaying Notifications-Understanding the Components of a Screen-Adapting to Display Orientation-Managing Changes to Screen Orientation- Utilizing the Action Bar-Creating the User Interface Programmatically Listening for UI Notifications

UNIT - III

Using Basic Views-Using Picker Views -Using List Views to Display Long Lists-Understanding Specialized Fragments - Using Image Views to Display Pictures -Using Menus with Views-Using WebView- Saving and Loading User Preferences-Persisting Data to Files-Creating and Using Databases.

UNIT - IV

Sharing Data in Android-Creating Your Own Content Providers -Using the Content Provider-SMS Messaging -Sending Email-Displaying Maps- Getting Location Data- Monitoring a Location.

UNIT - V



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSC21

CORE-XXI: PRACTICAL - VII
MOBILE APPLICATION DEVELOPMENT LAB

III YEAR / VI SEM

OBJECTIVES:

- To give overall view of Mobile application development
- Develop and Publish Android applications using Graphical user interface
- Develop and Publish Android application which can use Location and network services

OUTCOMES:

- At the end of the course, the student should be able to:
- Use Emulator tools to design and develop applications

Exercises

1. Develop an application that finds greatest among three numbers using GUI Components
2. Develop an application to display your personal details using GUI Components
3. Develop an application that uses the radio button
4. Develop an application that uses the image button
5. Develop an application that uses Alert Dialog Box
6. Develop an application that uses Layout Managers.
7. Develop an application that uses audio mode (NORMAL, SILENT, VIBRATE)
8. Develop an application that uses to send messages from one mobile to another mobile.
9. Develop an application that uses to send email
10. Develop an application for mobile calls.
11. Develop an application for Student Mark sheet processing
12. Develop an application for Login Page in Database.
13. Develop an application for Google map locator (optional)

WEB REFERENCES:

Develop the App online

- <https://flutter.dev/>
- <http://ai2.appinventor.mit.edu>



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSE2B

ELECTIVE-II(B): IOT AND ITS APPLICATIONS

(Common paper to B.Sc. Software Applications & B.C.A.)

III YEAR / VI SEM

OBJECTIVES:

- To understand the concepts of Internet of Things and the application of IoT.
- To Determine the Market perspective of IoT.
- To Understand the vision of IoT from a global context

OUTCOMES:

- Use of Devices, Gateways and Data Management in IoT.
- Design IoT applications in different domain and be able to analyze their performance
- Implement basic IoT applications on embedded platform.

UNIT - I

IoT & Web Technology, The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.

UNIT - II

M2M to IoT – A Basic Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT - III

IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

UNIT - IV

IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

UNIT - V

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

CORE-V: DATA STRUCTURES

BCA-DSC05

II YEAR / III SEM

OBJECTIVES:

- To understand the concepts of ADTs
- To learn linear data structures-lists, stacks, queues
- To apply Tree and Graph structures
- To understand sorting, searching and hashing

OUTCOMES:

- Implement abstract data types for linear data structures.
- Apply the different linear and non linear data structures to problem solutions.
- Critically analyze the various sorting algorithms.

UNIT - I

Abstract Data Types (ADTs)- List ADT-array-based implementation-linked list implementation-singly linked lists-circular linked lists-doubly-linked lists-applications of lists-Polynomial Manipulation- All operations-Insertion-Deletion-Merge-Traversal.

UNIT - II

Stack ADT-Operations- Applications- Evaluating arithmetic expressions – Conversion of infix to postfix expression-Queue ADT-Operations-Circular Queue- Priority Queue- deQueue-applications of queues.

UNIT - III

Tree ADT-tree traversals-Binary Tree ADT-expression trees-applications of trees-binary search tree ADT- Threaded Binary Trees-AVL Trees- B-Tree- B+ Tree – Heap-Applications of heap.

UNIT - IV

Definition- Representation of Graph- Types of graph-Breadth first traversal – Depth first traversal-Topological sort- Bi-connectivity – Cut vertex- Euler circuits-Applications of graphs.

UNIT - V

Searching- Linear search-Binary search-Sorting-Bubble sort-Selection sort-Insertion sort-Shell sort-Radix sort-Hashing-Hash functions-Separate chaining- Open Addressing-Rehashing-Extendible Hashing.

TEXT BOOKS:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education 2014, 4th Edition.
2. Reema Thareja, "Data Structures Using C", Oxford Universities Press 2014, 2nd Edition.

REFERENCES:

1. Thomas H.Cormen,Chales E.Leiserson,Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition.
2. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education 2003.

WEB REFERENCES:

- NPTEL & MOOC courses titled Data Structures



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

CORE-VI: JAVA PROGRAMMING

BCA-DSC06

II YEAR / III SEM

OBJECTIVES:

- To understand the concepts of Object Oriented Programming.
- To learn about the control structures, class with attributes and methods used in Java.

OUTCOMES:

- Knowledge of the structure and model of the Java programming language.
- Understand the basic principles of creating Java applications with GUI.
- Demonstrate use of string and String Buffers, Develop multithreaded programs in Java.

UNIT - I

Introduction to OOPS: Paradigms of Programming Languages – Basic concepts of Object Oriented Programming – Differences between Procedure Oriented Programming and Object Oriented programming - Benefits of OOPs – Application of OOPs. Java: History – Java features – Java Environment – JDK – API. Introduction to Java: Types of java program – Creating and Executing a Java program – Java Tokens- Java Virtual Machine (JVM) – Command Line Arguments –Comments in Java program.

UNIT - II

Elements: Constants – Variables – Data types - Scope of variables – Type casting – Operators: Special operators – Expressions – Evaluation of Expressions. Decision making and branching statements- Decision making and Looping– break – labeled loop – continue Statement. Arrays: One Dimensional Array – Creating an array – Array processing – Multidimensional Array – Vectors – ArrayList – Advantages of Array List over Array Wrapper classes.

UNIT - III

Class and objects: Defining a class – Methods – Creating objects – Accessing class members – Constructors – Method overloading – Static members –Nesting of Methods – this keyword – Command line input. Inheritance: Defining inheritance –types of inheritance– Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods and classes – Visibility Control- Interfaces: Defining interface – Extending interface - Implementing Interface - Accessing interface variables. Strings: String Array – String Methods – String Buffer Class.

UNIT - IV

Packages: Java API Packages – System Packages – Naming Conventions –Creating & Accessing a Package – Adding Class to a Package – Hiding Classes. Exception Handling: Limitations of Error handling – Advantages of Exception Handling - Types of Errors – Basics of Exception Handling – try blocks – throwing an exception – catching an exception – finally statement. Multithreading: Creating Threads – Life of a Thread – Defining & Running Thread – Thread Methods – Thread Priority – Synchronization –Implementing Runnable interface – Thread Scheduling.



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

UNIT - V

I/O Streams: File – Streams – Advantages - The stream classes – Byte streams –Character streams. Applets: Introduction – Applet Life cycle – Creating & Executing an Applet –Applet tags in HTML – Parameter tag – Aligning the display - Graphics Class: Drawing and filling lines – Rectangles – Polygon – Circles – Arcs – Line Graphs – Drawing Bar charts AWT Components and Event Handlers: Abstract window tool kit – Event Handlers – Event Listeners – AWT Controls and Event Handling: Labels – Text Component – Action Event – Buttons – Check Boxes – Item Event – Choice– Scrollbars – Layout Managers- Input Events – Menus.

TEXT BOOKS:

1. E. Balagurusamy, “*Programming with Java*”, TataMc-Graw Hill, 5th Edition.
2. Sagayaraj, Denis, Karthick and Gajalakshmi, “*Java Programming for Core and advanced learners*”, Universities Press (INDIA) Private Limited 2018.

REFERENCES:

1. Herbert Schildt, “*The complete reference Java*”, TataMc-Graw Hill, 7th Edition.

WEB REFERENCES:

- NPTEL & MOOC courses titled Java
- <https://nptel.ac.in/courses/106105191/>



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

CORE-III: COMPUTER ORGANIZATION
(Common paper to B.C.A.-III Sem.)

BCE-CSC03

I YEAR / II SEM

OBJECTIVES:

- To understand the basic organization of computers and the working of each component and CPU
- To bring the programming features of 8085 Microprocessor and know the features of latest microprocessors.
- To understand the principles of Interfacing I/O devices and Direct Memory accesses

OUTCOMES:

- Describe the major components of a computer system and state their function and purpose
- Describe the microstructure of a processor
- Demonstrate the ability to program a microprocessor in assembly language.
- Classify and describe the operation DMA and peripheral Interfaces.

UNIT - I

Data representation: Data types – Complements- fixed point and floating point representation other binary codes. Register Transfer and Microoperations: Register transfer language- Register transfer- Bus and Memory transfers – Arithmetic, logic and shift micro operations.

UNIT - II

Central processing unit: General register and stack organizations- instruction formats - Addressing modes- Data transfer and manipulation - program control- RISC - Pipelining - Arithmetic and instruction- RISC pipeline - Vector processing and Array processors.

UNIT - III

Microprocessor Architecture and its Operations - 8085 MPU - 8085 Instruction Set and Classifications. Programming in 8085: Code conversion - BCD to Binary and Binary to BCD conversions - ASCII to BCD and BCD to ASCII conversions - Binary to ASCII and ASCII to Binary conversions.

UNIT - IV

Programming in 8085: BCD Arithmetic - BCD addition and Subtraction - Multibyte Addition and Subtraction - Multiplication and Division. Interrupts: The 8085 Interrupt – 8085 Vectored Interrupts –

UNIT - V

Direct Memory Access(DMA)and 8257 DMA controller - 8255A Programmable Peripheral Interface. Basic features of Advanced Microprocessors - Pentium - I3 , I5 and I7



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSC08

CORE-VIII: PRACTICAL - III
DATA STRUCTURES USING JAVA LAB

II YEAR / III SEM

OBJECTIVES:

- To implement linear and non-linear data structures
- To understand the different operations of search trees
- To implement graph traversal algorithms
- To get familiarized to sorting and searching algorithms

OUTCOMES:

- Write functions to implement linear and non-linear data structure operations.
- Suggest appropriate linear and non-linear data structure operations for solving a given problem.
- Analyze various sorting methods.

LIST OF EXERCISES:

1. Write a Java programs to implement the List ADT using arrays and linked lists.
2. Write a Java programs to implement the following using a singly linked list. Stack ADT
(b) Queue ADT
3. Write a java program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).
4. Write a Java program to implement priority queue ADT.
5. Write a Java program to perform the following operations:
(a) Insert an element into a binary search tree.
(b) Delete an element from a binary search tree.
(c) Search for a key element in a binary search tree.
6. Write a Java program to perform the following operations
(a) Insertion into an AVL-tree
(b) Deletion from an AVL-tree
7. Write a Java programs for the implementation of BFS for a given graph.
8. Write a Java programs for the implementation of DFS for a given graph.
9. Write a Java programs for implementing the following searching methods:
(a) Linear search
(b) Binary search.
10. Write a Java programs for implementing the following sorting methods:
(a) Bubble sort
(b) Selection sort
(c) Insertion sort
(d) Quick sort



UNIVERSITY OF MADRAS
U.G. DEGREE COURSE

ENVIRONMENTAL STUDIES PROGRAMME

ABILITY ENHANCEMENT COMPULSORY COURSES

(AECC- Environmental Studies)

Syllabus with effect from the academic year 2018-2019

(i.e. for batch of candidates admitted to the course from the academic year 2017-18)

Credits: 2

II Year / III/IV Sem.

Unit 1: Introduction to Environmental Studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; concept of sustainability and sustainable development.

Unit 2 : Ecosystem (2 lectures)

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem:
Food chains, food webs and ecological succession, Case studies of the following ecosystem:
 - a) Forest ecosystem
 - b) Grassland ecosystem
 - c) Desert ecosystem
 - d) Aquatic ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

Unit 3: Natural Resources : Renewable and Non – renewable Resources (6 lectures)

- Land resources and land use change: Land degradation, soil erosion and desertification.
- Deforestation : Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water : Use and over –exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter-state).
- Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation (8 lectures)

- Levels of biological diversity: genetics, species and ecosystem diversity, Biogeographic zones of India: Biodiversity patterns and global biodiversity hot spots
- India as a mega- biodiversity nation, Endangered and endemic species of India.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions; Conservations of biodiversity: In-situ and Ex-situ Conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.



UNIVERSITY OF MADRAS
U.G. DEGREE COURSE

Unit 6: Environmental Policies & Practices (8 lecturers)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human Wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment (7 lectures)

- Human population growth, impacts on environment, human health and welfare.
- Resettlement and rehabilitation of projects affected persons; case studies.
- Disaster management: floods, earthquake, cyclone and landslides.
- Environmental movements : Chipko, Silent Valley, Bishnois of Rajasthan.
- Environmental ethics : Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies(e.g. CNG Vehicles in Delhi)

Unit 8 : Field Work (6 lectures)

- Visit to an area to document environmental assets: river / forest/ flora/ fauna etc.
- Visit to a local polluted site – Urban / Rural/ Industrial/ Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystem- pond, river, Delhi Ridge etc.

(Equal to 5 Lectures)

Suggested Readings:

1. Carson , R. 2002.Silent Spring, Houghton Mifflin Harcourt.
2. 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. Gleick,P.H.1993.Water Crisis. Pacific Institute for Studies in Dev.,Environment & Society. Stockholm Env. Institute. Oxford Univ. Press.



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-CSC09

CORE-IX: COMPUTER NETWORK

(Common paper to B.Sc. Software Applications-VI Sem. & B.C.A.)

III YEAR / V SEM

OBJECTIVES:

- To understand the concept of Computer network
- To impart knowledge about networking and inter networking devices

OUTCOMES:

- Analyze different network models
- Describe, analyze and compare a number of data link, network and transport layer
- Analysing key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI

UNIT - I

Introduction – Network Hardware - Software - Reference Models - OSI and TCP/IP Models - Example Networks: Internet, ATM, Ethernet and Wireless LANs - Physical Layer - Theoretical Basis for Data Communication - Guided Transmission Media.

UNIT - II

Wireless Transmission - Communication Satellites - Telephone System: Structure, Local Loop, Trunks and Multiplexing and Switching. Data Link Layer: Design Issues - Error Detection and Correction.

UNIT - III

Elementary Data Link Protocols - Sliding Window Protocols - Data Link Layer in the Internet - Medium Access Layer - Channel Allocation Problem - Multiple Access Protocols - Bluetooth.

UNIT - IV

Network Layer - Design Issues - Routing Algorithms - Congestion Control Algorithms - IP Protocol - IP Addresses - Internet Control Protocols.

UNIT - V

Transport Layer - Services - Connection Management - Addressing, Establishing and Releasing a Connection - Simple Transport Protocol - Internet Transport Protocols (ITP) - Network Security: Cryptography.

TEXT BOOK :

1. A. S. Tanenbaum, "Computer Networks", Prentice-Hall of India 2008, 4th Edition.

REFERENCE BOOKS:

1. Stallings, "Data and Computer Communications", Pearson Education 2012, 7th Edition.
2. B. A. Forouzan, "Data Communications and Networking", Tata McGraw Hill 2007, 4th Edition.
3. F. Halsall, "Data Communications, Computer Networks and Open Systems", Pearson Education 2008.
4. D. Bertsekas and R. Gallager, "Data Networks", PHI 2008, 2nd Edition.
5. Lamarca, "Communication Networks", Tata McGraw Hill 2002.

WEB REFERENCES:



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN SOFTWARE APPLICATION
SYLLABUS WITH EFFECT FROM 2020-2021

BSA-CSC15

CORE-XV: OPEN SOURCE TECHNOLOGIES

(Common paper to BCA-IV Sem.)

III YEAR / VI SEM

OBJECTIVES:

- To provide a basic idea of Open source technology, their software development process to understand the role and future of open source software in the industry along with the impact of legal, economic and social issues for such software.

OUTCOMES:

- To recognize the benefits and features of Open Source Technology and to interpret, contrast and compare open source products among themselves

UNIT- I

Introduction – Why Open Source – Open Source –Principles, Standards Requirements, Successes – Free Software – FOSS – Internet Application Projects

UNIT- II

Open source – Initiatives, Principles, Methodologies, Philosophy, Platform, Freedom, OSSD, Licenses – Copy right, Copy left, Patent, Zero Marginal Technologies, Income generation opportunities, Internalization

UNIT- III

Case Studies – Apache, BSD, Linux, Mozilla (Firefox), Wikipedia, Joomla, GCC, Open Office.

UNIT- IV

Open Source Project –Starting, Maintaining –Open Source – Hardware, Design, Teaching & Media

UNIT- V

Open Source Ethics – Open Vs Closed Source – Government – Ethics – Impact of Open source Technology – Shared Software – Shared Source

TEXT BOOK:

1. Kailash Vadera, Bhavyesh Gandhi, “Open Source Technology”, Laxmi Publications Pvt Ltd 2012, 1st Edition.

REFERENCE BOOK:

1. Fadi P. Deek and James A. M. McHugh, “Open Source: Technology and Policy”, Cambridge Universities Press 2007.

WEB REFERENCES:

- Coursera online course – Open Source Software Development Methods - <https://www.coursera.org/learn/open-source-software-development-methods>



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSC11

CORE-XI: E-COMMERCE TECHNOLOGIES

II YEAR / IV SEM

OBJECTIVES:

- To provide students with an overview and understanding of e-commerce with a specific emphasis on Internet Marketing.
- To explore the major issues associated with e-commerce-security, privacy, intellectual property rights, authentication, encryption, acceptable use policies, and legal liabilities.

OUTCOMES:

- Obtain a general understanding of basic business management concepts.
- Have complete knowledge about basic technical concepts relating to E-Commerce.
- Obtain thorough understanding about the security issues, threats and challenges of E-Commerce.

UNIT - I

History of E-commerce and Indian Business Context: E-Commerce –Emergence of the Internet – Emergence of the WWW – Advantages of E-Commerce – Transition to E-Commerce in India – The Internet and India – E-transition Challenges for Indian Corporate. Business Models for E-commerce: Business Model – E-business Models Based on the Relationship of Transaction Parties - E-business Models Based on the Relationship of Transaction Types.

UNIT - II

Enabling Technologies of the World Wide Web: World Wide Web – Internet Client-Server Applications –Networks and Internets – Software Agents – Internet Standards and Specifications – ISP. e-Marketing :Traditional Marketing – Identifying Web Presence Goals – Online Marketing – E-advertising – E-branding.

UNIT - III

E-Security: Information system Security – Security on the Internet – E-business Risk Management Issues – Information Security Environment in India. Legal and Ethical Issues : Cybers talking – Privacy is at Risk in the Internet Age – Phishing – Application Fraud – Skimming – Copyright – Internet Gambling – Threats to Children.

UNIT - IV

e-Payment Systems: Main Concerns in Internet Banking – Digital Payment Requirements – Digital Token-based e-payment Systems – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet – Risk and e-Payment Systems – Designing e-payment Systems – Digital Signature – Online Financial Services in India - Online Stock Trading.

UNIT - V

Information systems for Mobile Commerce: What is Mobile Commerce? – Wireless Applications –Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies –Different Generations in Wireless Communication – Security Issues Pertaining to Cellular Technology. Portals for E-Business: Portals – Human Resource Management – Various HRIS Modules.



UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN SOFTWARE APPLICATION
SYLLABUS WITH EFFECT FROM 2020-2021

BSA-CSC16

CORE-XVI: PRACTICAL - VII
OPEN SOURCE TECHNOLOGIES LAB
(Common paper to BCA-IV Sem.)

III YEAR / VI SEM

OBJECTIVES:

- To be aware of the various open source software available for different problem needs
- To be familiar with the usage of the software like installation and configuration

OUTCOMES:

- Students must be able to use appropriate open source tools based on the nature of the problem
- Students should be able to code and compile different open source software

Program List:

1. Study and usage of Libre Office Suite – Writer, Calc& Impress
2. Text Processing with PERL
3. Simple Applications using PHP
4. Simple Applications using Python
5. Image editing using GIMP
6. Study and usage of Business Intelligence tools – BIRT, JMagallanes
7. Creation of network diagrams using GraphViz
8. Linux Installation
9. Software Configuration in Linux environment.
10. Version Control System using Git.



Year: I		Semester: II
Object Oriented Programming using C++ Practical Common for B.C.A. , B.Sc.-SA		120C21
Credits 5	Lecture Hours:5 per week	
Learning Objectives: (for teachers: what they have to do in the class/lab/field) <ul style="list-style-type: none">• Design classes for the given problems.• Write programs in C++.• Code, debug and execute a C++ program to solve the given problems using an IDE.		
Course Outcomes: (for students: To know what they are going to learn) CO1: Design and create classes. Implement Stream I/O as appropriate. CO2: Design appropriate data members and member functions. CO3: Implement functions, friend functions, static members, constructors and compile-time polymorphism. CO4: Implement inheritance, run-time polymorphism and destructors. CO5: Implement templates and exceptions. Use STL class library. Implement File I/O.		

List of Programs	
1.	Write a class to represent a complex number which has member functions to do the following <ol style="list-style-type: none"> Set and show the value of the complex number Add, subtract and multiply two complex numbers Multiplying the complex number with a scalar value
2.	Write a Point class that represents a 2-d point in a plane. Write member functions to <ol style="list-style-type: none"> Set and show the value of a point Find the distance between two points Check whether two points are equal or not
3.	Design and implement a class that represents a Harmonic Progression (HP). Implement functions to do the following: <ol style="list-style-type: none"> Generate the HP up to a specified number of terms Calculate the sum of the HP to n terms and to infinity Generate the nth term of the HP Generate the corresponding Arithmetic Progression. (Design and implement a class that encapsulates an AP, and allow the HP class to use its facilities by implementing friend functions.)
4.	Design and implement a class to represent a Solid object.



UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (BCA)
DEGREE PROGRAMME
SYLLABUS WITH EFFECT FROM 2023-2024

6. Design a 3x3 matrix class and demonstrate the following:
 - a. Addition and multiplication of two matrices using operator overloading
 - b. Maintaining a count of the number of matrix object created
7. Design a class called cString to represent a string data type. Create a data member in the class to represent a string using an array of size 100. Write the following functionality as member functions:
 - a. Copy Constructor
 - b. Concatenate two strings
 - c. Find the length of the string
 - d. Reversing a string
 - e. Comparing two strings
8. Design a class called cString to represent a string data type. Create a data member in the class to represent a string whose size is dynamically allocated. Write the following as member functions:
 - a. Copy Constructor
 - b. Destructor
 - c. Concatenate two strings
 - d. Find the length of the string
 - e. Reversing a string
 - f. Comparing two strings
9. Create a class to represent a 2-d shape and derive classes to represent a triangle, rectangle and circle. Write a program using run-time polymorphism to compute the area of the figures.
10. Define a class template representing a single-dimensional array. Implement a function to sort the array elements. Include a mechanism to detect and throw an exception for array-bound violations.
11. Demonstrate the use of the vector STL container.



Object Oriented Programming using C++ Common for B.C.A. , B.Sc.-SA		120C2A
Credits 5		Lecture Hours:4 per week
Learning Objectives: (for teachers: what they have to do in the class/lab/field) <ul style="list-style-type: none"> • To engender an appreciation for the need and characteristics of Object-orientation. • To impart knowledge of the C++ language grammar in order to design and implement programming solutions to simple problems by applying Object-oriented thinking. 		
Course Outcomes: (for students: To know what they are going to learn) CO1: Explain the various basic concepts of Object-orientation. CO2: Write programs to implement static binding CO3: Write programs to implement inheritance and dynamic binding CO4: Write programs to implement templates and exception handling and learn how to use STL class library. CO5: Write programs implementing File and Stream I/O.		

Units	Contents
I	Object Oriented Programming Concepts: Complexity in software - The need for object-orientation – Abstraction – Encapsulation – Modularity – Hierarchy. Basic Elements of C++: Classes – Objects – Data members and member functions – private and public access specifiers - Static members - Constructors – Singleton class - Destructors - Friend Functions and Friend Classes - Array of objects – Pointer to objects - this pointer – References – Dynamic memory allocation - Namespaces.
II	Function Overloading: Overloading a function - Default arguments – Overloading Constructors. Operator Overloading: Overloading an operator as a member function – Overloading an operator as a friend function – Overloading the operators [], (), -> and comma operators – Conversion Functions.
III	Inheritance: Types of inheritance – protected access specifier –Virtual Base Class – Base class and derived class constructors. Run-time Polymorphism: Virtual Functions – Function overriding - Pure virtual function – Abstract base class.
IV	Templates: Function templates – Overloading a function template – Class templates. Standard Template Library (STL): Containers: vector, list – Iterators: forward, backward – Algorithms: removing and replacing elements, sorting, counting, reversing a sequence. Exception Handling: Exceptions – try, catch, throw – Rethrowing an exception – Restricting exceptions - Handling exceptions in derived classes - terminate(), abort(), unexpected(), set terminate()).
V	I/O Streams: Formatted I/O with ios class functions - Manipulators – Creating own

BSc comp

**ELECTIVE - I****GRAPHICS AND VISUALIZATION**

III YEAR / V SEM

OBJECTIVES:

- To introduce theoretical concepts behind computer graphics
- Overview of interactive computer Graphics
- Learn about two and three dimensional graphics
- Understand the concept of clipping and windowing
- To introduce the algorithms, tools and techniques for implementing the same.

OUTCOMES:

- Know the principles of Display devices
- Understand various algorithms to scan, convert and basic geometrical primitives, transformations, Area filling and clipping.
- Capture the significances of viewing and projections.
- Define the fundamentals of 2D, 3D and color models.

UNIT - I

Introduction – Display devices – Hard copy devices – Interactive input devices – display processors -graphics software – O/P primitives – line drawing algorithm – DDA- Bresenham's – anti aliasing of lines – line command – circle drawing algorithm.

UNIT - II

Attributes of output primitives – line style – color and intensity- Character attributes – Two dimensional transformations - basic and composite transformation – matrix representation – other transformation.

UNIT - III

Windowing and Clipping: windowing concepts – window to view port transformation – Clipping – line – polygon clipping

UNIT - IV

Interactive Input methods - Physical input devices – Logical classification of input devices – Interactive picture construction techniques – Input functions

UNIT - V

Three dimensional concepts – Display methods – Three dimensional Geometric and Modeling transformations – Other transformations – 3D viewing – Projections – animation-Visible surface detection methods-classification of visible-surface detection Algorithms-Blackface detection-Depth buffer method-Scan line method-Color models and Color Applications.

TEXT BOOK:

1. Donald Hearn and M. Pauline Baker, Warren Carithers, "Computer Graphics With Open GL", Pearson Education 2010, 4th Edition.

REFERENCE BOOKS:

1. W. M. New Man and R. F. Sproull, "Principles of interactive Computer Graphics", McGraw Hill International Edition.

**CORE IX****INTRODUCTION TO DATA SCIENCE**

III YEAR / V SEM

OBJECTIVES:

- To introduce the concepts, techniques and tools with respect to the various facets of data science practice, including data collection and integration, exploratory data analysis, predictive modeling, descriptive modeling and effective communication.

OUTCOMES:

- To describe what Data Science is, what Statistical Inference means, identify probability distributions, fit a model to data and use tools for basic analysis and communication

UNIT-I

Introduction to Data Science – Benefits and uses – Facets of data – Data science process – Big data ecosystem and data science

UNIT-II

The Data science process – Overview – research goals - retrieving data - transformation – Exploratory Data Analysis – Model building

UNIT-III

Algorithms - Machine learning algorithms – Modeling process – Types – Supervised – Unsupervised - Semi-supervised

UNIT-IV

Introduction to Hadoop – framework – Spark – replacing MapReduce– NoSQL – ACID – CAP – BASE – types

UNIT-V

Case Study – Prediction of Disease - Setting research goals - Data retrieval – preparation - exploration - Disease profiling presentation and automation

TEXT BOOK

1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, "Introducing Data Science", manning publications 2016.

REFERENCE BOOKS

1. Roger Peng, "The Art of Data Science", lulu.com 2016.
2. MurtazaHaider, "Getting Started with Data Science – Making Sense of Data with Analytics", IBM press, E-book.
3. Davy Cielen, Arno D.B. Meysman, Mohamed Ali, "Introducing Data Science: Big Data, Machine Learning, and More Using Python Tools", Dreamtech Press 2016.

**CORE - X****INTRODUCTION TO CLOUD COMPUTING**

III YEAR /V I SEM

OBJECTIVES:

- To understand the concepts in Cloud Computing and its Security
- To understand the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud.

OUTCOMES:

- To explain and apply levels of services of Cloud
- To describe the security aspects in cloud.

UNIT - I

Cloud Computing Foundation: Introduction to Cloud Computing – Move to Cloud Computing – Types of Cloud – Working of Cloud Computing

UNIT - II

Cloud Computing Architecture : Cloud Computing Technology – Cloud Architecture – Cloud Modeling and Design - Virtualization : Foundation – Grid, Cloud and Virtualization – Virtualization and Cloud Computing

UNIT - III

Data Storage and Cloud Computing : Data Storage – Cloud Storage – Cloud Storage from LANs to WANs – Cloud Computing Services : Cloud Services – Cloud Computing at Work

UNIT - IV

Cloud Computing and Security : Risks in Cloud Computing – Data Security in Cloud – Cloud Security Services – Cloud Computing Tools : Tools and Technologies for Cloud – Cloud Mashups – Apache Hadoop – Cloud Tools

UNIT - V

Cloud Applications – Moving Applications to the Cloud – Microsoft Cloud Services – Google Cloud Applications – Amazon Cloud Services – Cloud Applications

TEXT BOOK:u

1. A.Srinivasan and J.Suresh, “*Cloud Computing – A Practical Approach for Learning and Implementation*”, Pearson India Publications 2014.

**PRACTICAL - VII****CASE TOOLS AND TESTING**

III YEAR / VI SEM

OBJECTIVES:

- To get familiarized to the usage of UML tool kit.
- To understand the requirements of the software and to map them appropriately to subsequent phases of the software development
- To develop the ability to verify and validate their designs

OUTCOMES:

- Students must be able to analyze and design the problem at hand.
- Students should be able to use UML tools for the designing the software and test the correctness and soundness of their software through testing tools.

LIST OF EXERCISES:

1. Using UML tools produce analysis and design models for
 - a. Library Management System
 - b. Automatic Teller Machine
 - c. Student Information Management
 - d. Matrimony Service
 - e. Stock Management System
2. Study of Open source testing tools (eg. Selenium, WATIS, Apache JMeter, TestNG)

**PRACTICAL – VIII****MINI PROJECT**

III YEAR / VI SEM

OBJECTIVES:

The aim of the mini project is that the student has to understand the real time software development environment. The student should gain a thorough knowledge in the problem, he/she has selected and the language / software, he/she is using.

Project planning:

B.Sc (Computer Science / Software Application)/BCA Major Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions of first internal project viva voce should be completed in the first term of final year.

I Selection of the project work

Project work could be of three types.

a) Developing solution for real life problem

In this case a requirement for developing a computer-based solution already exists and the different stages of system development life cycle is to be implemented successfully. Examples are accounting software for particular organization, computerization of administrative function of an organization, web based commerce etc.

b) System Software Project

Projects based on system level implementation. An example is a Tamil language editor with spell checker, compiler design.

b) Research level project

These are projects which involve research and development and may not be as structured and clear cut as in the above case. Examples are Tamil character recognition, neural net based speech recognizer etc. This type of projects provides more challenging opportunities to students.

II Selection of team

To meet the stated objectives, it is imperative that major project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with three members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if students are doing project as groups, each one must independently take different modules of the work and must submit the report.

III Selection of Tools

No restrictions shall be placed on the students in the choice of platform/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

IV Project management

Head of the Department / Principal of the college should publish the list of student's project topic, internal guide and external organization and teams agreed before the end of July. Changes in this list may be permitted for valid reasons and shall be considered favorably by the Head of the department / Principal of the college any time before commencement of the project. Students should submit a fortnightly report of the progress, which could be indication of percentage of completion of the project work. The students should ideally keep a daily activity book. Team meeting should be documented and same should be submitted at the end of the project work.

**V Documentation**

Three copies of the project report must be submitted by each student (one for department library, one for the organization where the project is done and one for the student himself/herself). The final outer dimensions of the project report shall be 21cm X 30 cm. The color of the flap cover shall be light blue. Only hard binding should be done. The text of the report should be set in 12 pt, Times New Roman, 1.5 spaced.

Headings should be set as follows: CHAPTER HEADINGS 16 pt, Arial, Bold, All caps, Centered.

1. Section Headings 14 pt Bookman old style, Bold, Left adjusted.

1.1 Section Sub-heading 12 pt, Bookman old style.

Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.

Content of the Project should be relevant and specify particularly with reference to the work. The report should contain the requirement specification of the work, Analysis, Design, Coding, testing and Implementation strategies done.

- Organizational overview (of the client organization, where applicable)
- Description of the present system
- Limitations of the present system

- The Proposed system - Its advantages and features
- Context diagram of the proposed system
- Top level DFD of the proposed system with at least one additional level of expansion
- Program List (Sample code of major functions used)
- Files or tables (for DBMS projects) list. List of fields or attributes (for DBMS projects) in each file or table.
- Program – File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.
- Screen layouts for each data entry screen.
- Report formats for each report.

Some general guidelines on documentation are:

1. Certificate should be in the format: "Certified that this report titled.....is a bonafide record of the project work done by Sri/ Kumunder our supervision and guidance, towards partial fulfillment of the requirement for award of the Degree of B.Sc Computer Science/BCA of XXX College" with dated signature of

2. If the project is done in an external organization, another certificate on the letterhead of the organization is required: "Certified that his/her report titledis a bonafide record of the project work done by Sri/Kum.....under my supervision and guidance, at thedepartment of..... (Organization) towards partial fulfillment of the requirement for the award of the Degree of B.Sc (Computer Science) / BCA of XXX College.

3. Page numbers shall be set at right hand bottom, paragraph indent shall be set as 3.

4. Only 1.5 space need be left above a section or subsection heading and no space may be left after them.

5. References shall be IEEE format (see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.

VI Project Evaluation:**Internal Assessment**

There shall be six components that will be considered in assessing a project work with weightage as indicated.

1. Timely completion of assigned tasks as evidenced by team meeting minutes 20%
2. Individual involvement, team work and adoption of industry work culture 10%
3. Quality of project documentation (Precision, stylistics etc) 10%
4. Achievement of project deliverables 20%
5. Effective technical presentation of project work 10%
6. Viva 30%

Based on the above 6 components internal mark (40) can be awarded.

External Assessment

Dissertation/Project submitted at the end of third year shall be valued by two examiners appointed by the Controller for the conduct of practical exam. The board of examiners shall award 40 marks based on the following components.

1. Achievement of project deliverables - 20 Marks
2. Effective technical presentation of project work - 20 Marks
3. Project Viva - 20 Marks

There shall be a common written examination conducted for all the candidates in each group together for a minimum of 10 minutes.

- (i) Requirement Specification of Project
- (ii) Design of Project
- (iii) Testing and Implementation of Project

**CORE - IV****WEB TECHNOLOGY****II YEAR / IV SEM****OBJECTIVES:**

- To use PHP and MySQL to develop dynamic web sites for user on the Internet
- To develop web sites ranging from simple online information forms to complex e-commerce sites with MySQL database, building, connectivity, and maintenance

OUTCOMES:

- Understand the general concepts of PHP scripting language for the development of Internet websites.
- Understand the basic functions of MySQL database program and XML concepts
- Learn the relationship between the client side and the server side scripts.

UNIT - I

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT - II

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

UNIT - III

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

UNIT - IV

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files- Processing Directories.

UNIT - V

Working with Database and SQL : Introducing Database and SQL- Using MySQL-Adding and modifying Data- Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML - Simple XML and DOM Extension.

TEXT BOOK:

1. VikramVaswani, “*PHP A Beginner's Guide*”, Tata McGraw Hill 2008.

REFERENCE BOOKS:

1. Steven Holzner, “*The PHP Complete Reference*”, Tata McGraw Hill, 2007.
2. Steven Holzner, “*Getting into PHP*”, Tata McGraw Hill 2011, 2nd Edition.

**PRACTICAL IV****WEB TECHNOLOGY LAB****II YEAR / IV SEM****OBJECTIVES:**

1. The objectives of this course are to have a practical understanding about how to write PHP code to solve problems.
2. Display and insert data using PHP and MySQL.
3. Test, debug, and deploy web pages containing PHP and MySQL.
4. It also aims to introduce practical session to develop simple applications using PHP and MySQL.

OUTCOMES:

- On the completion of this laboratory course the students ought to
- Obtain knowledge and develop application programs using Python.
- Create dynamic Web applications such as content management, user registration, and e-commerce using PHP and to understand the ability to post and publish a PHP website.
- Develop a MySQL database and establish connectivity using MySQL.

LIST OF PRACTICALS

1. Write a PHP program which adds up columns and rows of given table
2. Write a PHP program to compute the sum of first n given prime numbers
3. Write a PHP program to find valid an email address
4. Write a PHP program to convert a number written in words to digit.
5. Write a PHP script to delay the program execution for the given number of seconds.
6. Write a PHP script, which changes the colour of the first character of a word
7. Write a PHP program to find multiplication table of a number.
8. Write a PHP program to calculate Factorial of a number.
9. Write a PHP script to read a file, reverse its contents, and write the result back to a new file
10. Write a PHP script to look through the current directory and rename all the files with extension .txt to extension .tx.
11. Write a PHP script to read the current directory and return a file list sorted by last modification time. (*using filemtime()*)
12. Write a PHP code to create a student mark sheet table. Insert, delete and modify records.
13. From a XML document (email.xml), write a program to retrieve and print all the e-mail addresses from the document using XML.


Year: I
Semester: II

Introduction to Computer Architecture and Microprocessor Practical		125C21
Credits 5	Lecture Hours:5 per week	
Learning Objectives: (for teachers: what they have to do in the class/lab/field)		
<ul style="list-style-type: none">• To introduce the internal organization of Intel 8085 Microprocessor.• To enable the students to write assembly language programs using 8085.• To interface the peripheral devices to 8085 using Interrupt controller and DMA interface.• To provide real-life applications using microcontroller.		
Course Outcomes: (for students: To know what they are going to learn)		
CO1: Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 8085.		
CO2: Understanding the 8085-instruction set and their classifications, enables the students to write the programs easily on their own using different logic.		
CO3: Applying different types of instructions to convert binary codes and analysing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.		
CO4: Analyse how peripheral devices are connected to 8085 using Interrupts and DMA controller.		

List of Programs
Addition and Subtraction

1. 8 - bit addition
2. 16 - bit addition
3. 8 - bit subtraction
4. BCD subtraction

Multiplication and Division

1. 8 - bit multiplication
2. BCD multiplication
3. 8 - bit division

Sorting and Searching

**Code Conversion**

1. BCD to Hex and Hex to BCD
2. Binary to ASCII and ASCII to binary
3. ASCII to BCD and BCD to ASCII

Applications

1. Square of a single byte Hex number
2. Square of a two-digit BCD number
3. Square root of a single byte Hex number
4. Square root of a two-digit BCD number

TEXT BOOKS:

1. M.M. Mano, "Computer System architecture". Pearson, Third Edition, 2007
2. R. S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085"- 5th Edition- Penram- 2009.
3. Tripti Dodiya & Zakiya Malek, "Computer Organization and Advanced Microprocessors", CengageLearning, 2012.

REFERENCE BOOKS:

1. Mathur- "Introduction to Microprocessor"- 3rd Edition- Tata McGraw-Hill-1993.
2. P. K. Ghosh and P. R. Sridhar- "0000 to 8085: Introduction to Microprocessors for Engineers and Scientists"- 2nd Edition- PHI- 1995.
3. NagoorKani- "Microprocessor (8085) and its Applications"- 2nd Edition- RBA Publications- 2006.
4. V. Vijayendran- "Fundamentals of Microprocessors – 8085"- S. Viswanathan Pvt. Ltd.- 2008.

WEB REFERENCES:

NPTEL & MOOC courses titled Computer organization
<https://nptel.ac.in/courses/106105163/>



Introduction to Computer Architecture and Microprocessor		125C2A
Credits 5		Lecture Hours:4 per week
<p>Learning Objectives: (for teachers: what they have to do in the class/lab/field)</p> <ul style="list-style-type: none"> To introduce the internal organization of Intel 8085 Microprocessor. To enable the students to write assembly language programs using 8085. To interface the peripheral devices to 8085 using Interrupt controller and DMA interface. 		
<p>Course Outcomes: (for students: To know what they are going to learn)</p> <p>CO1: Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 8085.</p> <p>CO2: Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic..</p> <p>CO3: Applying different types of instructions to convert binary codes and analysing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.</p> <p>CO4: Analyse how peripheral devices are connected to 8085 using Interrupts and DMA controller.</p>		
Units	Contents	
I	Digital Computers - Microcomputer Organization-Computer languages Number Systems: Decimal, Binary, Octal. Hexadecimal. Conversions: Conversion between all four number systems of integer and floating-point values. Data representation: fixed point and floating-point representation - Character codes	
II	Addition, subtraction (9's Complement for decimal, 10's complement for decimal, 1's complement, 2's complement methods), multiplication and division of binary numbers. - Differentiate Binary and BCD representations - BCD to Binary and Binary to BCD conversions, BCD addition and Subtraction. 8085 Microprocessor: Architecture, Pinout and Signals – Functional block diagram -	
III	8085 Instruction Set and addressing modes- 8085 sample programs using data transfer, arithmetic and JMP instructions– function calls in 8085	
III	8085 Instruction Set and addressing modes- 8085 sample programs using data transfer, arithmetic and JMP instructions– function calls in 8085	
IV	The 8085 Interrupts – RIM AND SIM instructions-8259 Programmable Interrupt Controller-Direct Memory Access (DMA) and 8257 DMA controller.	
V	Program control- RISC - Pipelining -Arithmetic instruction- RISC pipeline - Vector processing and Array processors.	

Commerce S1

1	Environmental Studies	ENV4B
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	2	MS Office for Commerce	146S1A
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Management

<u>S.No</u>	Name of the Course (as per the curriculum)
1	OPERATIONS MANAGEMENT



Unit	Contents	No. of Hours
I	<p>Introduction to MS Word & Commonly used features</p> <p>Introduction to Word processing -Word processor / Editor - File Extension - DOCx, DOTx - Application / Document area</p> <p>Title Bar, Menu Bar, Ribbon, Icons, Status Bar, Scroll Bar - Page Layout - Page Size (Letter / A4) - Orientation (Landscape / Portrait) - Margin (Top, Left, Bottom, Right) -Navigation(Arrow keys, Ctrl + Arrow keys, Home, End, Page UP/ Page Down) - Selection - Using Shift + Navigation</p> <p>Fonts / Superscript / Subscript - Show / Hide - Displays non printing characters (Space / TAB / Enter) - Change Case - Bullets / Numbering - Format Painter – Clipboard - Find / Replace</p> <p>Screen shot - Prnt SCR / Alt + PrntScr – Indent - Line and Para spacing - Tab Stop - Text to Table - Table to Text</p>	6



II	<p>Insert Tab & Mail Merge</p> <p>Insert Tab - Picture (Styles, Border, Effects, Warp Text, Align, Rotate, Flip, Crop) - Water Mark - Shapes (Group, Ungroup, Bring to Front, Send to Back, Format shape) – Hyperlink – Bookmark - Text Box - Word Art</p> <p>Tables - Rows , Columns, Cell - Merge Cell - Split Cell</p> <p>TOC - Update entire - Header / Footer - Cover Page - Break - Section Break - Spell Check - ABC / F7 - Word Count</p> <p>Working with Mail Merge</p>	6
III	<p>Introduction to MS Powerpoint</p> <p>Creating Presentation - File Extension - PPTx, PPSx - Slides and Layouts, Apply Background - Title Bar, Menu Bar, Ribbon, Icons, Status Bar, Scroll Bar</p> <p>- View - Slide Master</p> <p>Insert Logo - to display in all slides - Change Text color - to maintain consistency in all slides</p> <p>Slideshow - F5 / Shift</p> <p>F5 New Slide - Ctrl + M</p> <p>Animation Effects - Apply in objects within the Slide</p> <p>Transition Effect - Apply between slides</p> <p>Rehearse Timing - Set timing to each slide</p> <p>Loop until ESC - After reaching LAST slide, display again from 1st slide.</p> <p>SaveAs - PPSx - PowerPoint Show</p> <p>SlideShow - Use Pen / Highlighter</p> <p>Paste the Chart from Excel - Data linked to Excel source</p>	6



	Introduction to MS Excel &Using Formulas Working with Excel Opening a Workbook - Understanding the Display Screen Working with the Ribbon - Exploring the File Tab - Working with the Quick Access Toolbar - Working with the Status Bar- Switching Between Opened Workbooks Entering Data - Moving the Cell Pointer - Selecting a Range of Cells - Creating a New Workbook - Inserting, Renaming, and Deleting Worksheets - Entering Constant Values - Using Auto Fill to Enter Data - Saving a Workbook - Editing Cell Contents Clearing Cell Contents - Insert / Edit Comments - Working with Undo and Redo - Closing a Workbook	
IV	Using Formulas Entering Formulas with Addressing Methods (Relative / Mixed / Absolute) - Using Auto Fill with Formulas - Using the Sum, Average, Max, Min, Count Functions - Using IF and NestedIf Function - Using Text Functions (Len, Trim, Left, Right, Mid, Find, Replace, Upper, Lower, Proper) - Using Date Functions (Today, Now, Day, Month, Year) - Using Lookup Functions (Vlookup, Hlookup) - Using Formula Error Checking - Cutting / Copying and Pasting Constant Values and Formulas - Copy / Pasting using Transpose option - Using Format Painter	6