



University of Madras

Chepauk, Chennai 600 005

[Est. 1857, State University, NAAC 'A' Grade, CGPA 3.32, NIRF 2019 Rank: 20]

Website: www.unom.ac.in, Tel. 044-2539 9561

Undergraduate Programme in Computer Applications

**Bachelor of Computer Applications (BCA)
(With effect from the Academic Year 2020-21)**

February 2020

Learning Outcome Based Curriculum Framework

Note: The Board of Studies is designed Learning Outcomes Based Curriculum Framework of Under Graduate Computer Application Programme prescribed by UGC

I Preamble

Bachelor of Computer Applications (BCA) is a 3 – Year Under Graduate Programme Spread over six semesters. The Course is designed to bridge the gap between IT industries and Academic institutes by incorporating the latest development, into the Curriculum and to give students a complete understanding within a structured framework. The Course helps the students to build-up a successful Career in Computer Science and for pursuing higher studies in Computer Science.

II Course Objectives

- Provide strong foundations in fundamentals of Computer Science and applications, inter disciplinary courses and electives for widening the domain expertise.
- Design and develop software based solutions for real world problems, serving effectively to the requirements of computer field and Society
- Attain sufficient knowledge related to computer domains, possesses technical, soft and hard skills and apply them effectively in team work
- Empower the students with competencies in creative thinking and problem solving, inter-personal communication and managerial skills.

III Graduate Attributes

- Computational Knowledge
- Problem analysis & Solving
- Design & Development of Solutions
- Modern tool usage
- Communication skills
- Innovation & Entrepreneurship
- Societal & environmental concern

IV Course Outcomes

After Completion of the course, the students are expected to

- Understand the basic principles and concepts of Computer applications and integrate the knowledge gained in Computer application domain with practical needs of the society and be an ethically and socially responsible Computer Application Professional
- Explore emerging technologies in diverse areas of Computer Application and inculcate skills for successful career, entrepreneurship and higher studies
- Ability to apply the concepts of Computer and practices via emerging technologies and Software development tools.

COURSE STRUCTURE:

| I SEMESTER | | | | | |
|----------------------|--|---|------------|------|-------|
| COURSE CONTENT | COURSE NAME | CREDITS | MAX. MARKS | | |
| | | | Ext. | Int. | Total |
| PART I | Tamil/ Other languages – I | 3 | 75 | 25 | 100 |
| PART II | English – I | 3 | 75 | 25 | 100 |
| PART III | BCE-CSC01 - Problem Solving using Python@ | 4 | 75 | 25 | 100 |
| | BCE-CSC02 - Core Practical-I - Problem Solving using Python Lab@ | 2 | 60 | 40 | 100 |
| | Allied I: Mathematics I@ | 5 | 75 | 25 | 100 |
| PART IV | Basic Tamil/Advanced Tamil/NME | 2 | 75 | 25 | 100 |
| | Soft Skill I | 3 | 50 | 50 | 100 |
| Total Credits | | 22 | | | |
| II SEMESTER | | | | | |
| PART I | Tamil/ Other languages – II | 3 | 75 | 25 | 100 |
| PART II | English – II | 3 | 75 | 25 | 100 |
| PART III | BSA-CSC03 - Object Oriented Programming Concepts using C ++@ | 4 | 75 | 25 | 100 |
| | BSA-CSC04 - Core Practical-II - C++ programming Lab@ | 3 | 60 | 40 | 100 |
| | Allied II: Mathematics II@ | 5 | 75 | 25 | 100 |
| PART IV | Basic Tamil/Advanced Tamil/Non Major Elective II | 2 | 75 | 25 | 100 |
| | Soft Skill II | 3 | 50 | 50 | 100 |
| Total Credits | | 23 | | | |
| III SEMESTER | | | | | |
| PART III | BCA-DSC05 - Data Structures | 4 | 75 | 25 | 100 |
| | BCA-DSC06 - Java programming | 4 | 75 | 25 | 100 |
| | BCE-CSC03 - Computer Organization@ | 4 | 75 | 25 | 100 |
| | BCA-DSC08 - Core Practical-III - Data Structures using Java Lab | 3 | 60 | 40 | 100 |
| | Allied III: Financial Accounting | 5 | 75 | 25 | 100 |
| PART IV | Soft Skill III | 3 | 50 | 50 | 100 |
| | Environmental Studies | Examination will be held in Semester IV | | | |
| Total Credits | | 23 | | | |
| IV SEMESTER | | | | | |
| PART III | BCE-CSC09 - Computer Network@ | 4 | 75 | 25 | 100 |
| | BSA-CSC15 - Open Source Technologies@ | 4 | 75 | 25 | 100 |
| | BCA-DSC11 - E-Commerce technologies | 4 | 75 | 25 | 100 |
| | BSA-CSC16 - Core Practical-IV - Open Source Technologies Lab@ | 3 | 60 | 40 | 100 |
| | Allied IV: Cost and Management Accounting | 5 | 75 | 25 | 100 |
| PART IV | Soft Skill IV | 3 | 50 | 50 | 100 |
| | Environmental Studies | 2 | 75 | 25 | 100 |
| Total Credits | | 25 | | | |

| V SEMESTER | | | | | |
|-----------------------|---|----------------|-------------------|-------------|--------------|
| COURSE CONTENT | COURSE NAME | CREDITS | MAX. MARKS | | |
| | | | Ext. | Int. | Total |
| PART III | BCE-CSC14 - Software Engineering@ | 4 | 75 | 25 | 100 |
| | BCE-CSC10 - Operating System@ | 4 | 75 | 25 | 100 |
| | BCE-CSC11 - Relational Database Management System@ | 4 | 75 | 25 | 100 |
| | BCE-CSC12 - Core Practical-V - Operating System Lab@ | 3 | 60 | 40 | 100 |
| | BCE-CSC13 - Core Practical-VI - PL/SQL Lab@ | 2 | 60 | 40 | 100 |
| | Elective I Choose any one from the list | 5 | 75 | 25 | 100 |
| PART IV | Value Education | 2 | 75 | 25 | 100 |
| | Total Credits | 24 | | | |
| VI SEMESTER | | | | | |
| PART III | BCA-DSC18 - Web Design and Development | 4 | 75 | 25 | 100 |
| | BCA-DSC19 - Data Mining | 4 | 75 | 25 | 100 |
| | BCA-DSC20 - Mobile Application Development | 4 | 75 | 25 | 100 |
| | BCA-DSC21 - Core Practical-VII - Mobile Application Development Lab | 3 | 60 | 40 | 100 |
| | Elective II- Choose any one from the list | 5 | 75 | 25 | 100 |
| | BCE-CSC18 - Mini Project@ | 5 | 60 | 40 | 100 |
| PART V | Extension Activities | 1 | | | |
| | Total Credits | 26 | | | |
| | Total credits (Core, Elective, SBS) | 143 | | | |

***NME: Choose Any one From the Other Department**

| | Elective I |
|-----------|------------------------------------|
| BCA-DSE1A | Principles of Information Security |
| BSA-CSE1B | Multimedia and its Applications@ |
| BCA-DSE1C | Resource Management Techniques |
| | Elective II |
| BSA-CSE2A | Data Analytics using R@ |
| BCE-CSE2B | IOT and its Applications@ |
| BCA-DSE2C | Software Project Management |

@ - Common subject to other course/s.

சென்னைப்பல்கலைக்கழகப்பாடத்திட்டமாற்றம்

2020 ஆம்கல்வியாண்டுமுதல்

பொதுத்தமிழ் – (Foundation Course)

B.A./B.Sc./B.Com.,

BFC-LT001

முதற்பருவம் I SEMESTER

பாடப்பகுப்பு

I இலக்கியம்

II பாடம்சார்ந்ததமிழிலக்கியவரலாறு

III மொழிப்பயிற்சி

முதல்பருவம்

இலக்கியம்

அலகு 1

மரபுக்கவிதை

- பாரதியார் – பாரதசமுதாயம்.
- பாரதிதாசன் – ஒற்றுமைப்பாட்டு
- கவிமணிதேசிகவிநாயகம்பிள்ளை – உடல்நலம்பேணல்
- நாமக்கல்கவிஞர்வெ. இராமலிங்கம்பிள்ளை – தமிழன்இதயம்
- கவிஞர்கண்ணதாசன் – குடும்பம்ஒருகதம்பம்
- பட்டுக்கோட்டைஅ. கல்யாணசுந்தரம் – வருங்காலம்உண்டு
- தமிழ்ஒளி – வழிப்பயணம்

புதுக்கவிதை

- கவிஞர்ந. பிச்சமூர்த்தி – காதல், லீலை
- கவிஞர்அப்துல்ரகுமான் – பித்தன்
- கவிஞர்மு.மேத்தா – ஒருகடிதம்அனாதையாகிவிட்டது, நிழல்கள்
- கவிஞர்இன்குலாப் –
ஒவ்வொருபுல்லையும்பெயர்சொல்லிஅழைப்பேன்

- கவிஞர்தமிழன்பன் – சொல்லில்உயர்வுதமிழ்ச்சொல்லே
- கவிஞர்வைரமுத்து – விதைச்சோளம்
- கவிஞர்அ.சங்கரி – இன்றுநான்பெரியபெண்

அலகு 2

- ஏற்றப்பாட்டு
- தெம்மாங்கு
- அம்பாபாடல்கள்
- விளையாட்டுப்பாடல்கள்
- நடவுப்பாடல்கள்

அலகு 3

சிறுகதைகள்

- கு.ப.ரா – கனகாம்பரம்
- கு.அழகிரிசாமி – குமாரபுரம்ஸ்டேஷன்
- தமிழ்ச்செல்வன் – வெயிலோடுபோய்
- தோப்பில்முகமதுமீரான் – வட்டக்கண்ணாடி
- அம்பை – பிளாஸ்டிக்டப்பாவில்பராசக்திமுதலியோர்

உரைநடை

- இரா.பி.சேதுப்பிள்ளை – வண்மையும்வறுமையும்

அலகு 4

- நா.முத்துசாமி – நாற்காலிக்காரர்

அலகு 5

தமிழிலக்கியவரலாறு

- மரபுக்கவிதை – இருபதாம்நூற்றாண்டுகவிஞர்கள்
- புதுக்கவிதை

- நாட்டுப்புறப்பாடல்கள், கதைகள், கதைப்பாடல்கள், பழமொழிகள், விடுகதைகள்
- சிறுகதை, உரைநடைவரலாறு
- நாடகம் – சார்ந்தபகுதிகள்

அலகு 6

மொழிப்பயிற்சி

- வாக்கியவகை(தொடர்வாக்கியம், தனிவாக்கியம், கூட்டுவாக்கியம்)
- இருவழக்குகள் (பேச்சு, எழுத்து)
- எழுவாய், பயனிலை, செயப்படுபொருள்
- ஒருமை, பன்மைமயக்கம்
- திணை, பால், எண், இடவேறுபாடு
- நால்வகைச்சொற்கள் (பெயர், வினை, இடை, உரி)
- அகரவரிசைப்படுத்துதல்

மதிப்பெண்பங்கீடு– I & II – 50 மதிப்பெண்கள்

III – 25 மதிப்பெண்கள்

UNIVERSITY OF MADRAS
UG & 5 YR INTEGRATED DEGREE COURSES
SYLLABUS – OTHER LANGUAGES

BP1-LHIN1

PART-I - HINDI
(With effect from the Academic Year 2015-2016)

I YEAR – I SEMESTER

PAPER – I - PROSE, FUNCTIONAL HINDI & LETTER WRITING

I. PROSE (Detailed Study) : HINDI GADHYA MALA
Ed. by Dr. Syed Rahamathulla
Poornima Prakashan, 4/7 Begum III Street
Royapettah, Chennai – 14.

LESSONS PRESCRIBED :

1. Sabhyata ka Rahasya
2. Mitrata
3. Yuvavon sen
4. Paramanu Oorja evam Khadya Padarth Sanrakshan
5. Yougyata aur Vyavasay ka Chunav.

II. FUNCTIONAL HINDI & LETTER WRITING

Students are expected to know the office and Business Procedures, Administrative and Business Correspondence.

1. General Correspondence:

1. Personal Applications
2. Leave Letters
3. Letter to the Editor
4. Opening an A/C
5. Application for Withdrawal
6. Transfer of an A/C
7. Missing of Pass Book / Cheque Leaf
8. Complaints
9. Ordering for Books
10. Enquiry

III. OFFICIAL CORRESPONDENCE:

1. Government Order
2. Demi Official Letter
3. Circular
4. Memo
5. Official Memo
6. Notification
7. Resolution
8. Notice

BOOKS FOR REFERENCE :

1. Karyalayeen Tippaniya : Kendriya Hindi Sansthan, Agra
2. Prayojan Moolak Hindi : Dr. Syed Rahamathulla, Poornima Prakashan
4/7, Begum III Street, Royapettah, Chennai – 14.

UNIVERSITY OF MADRAS
UG & 5 YR INTEGRATED DEGREE COURSES
SYLLABUS – OTHER LANGUAGES

BP1-LFRE1

PART – I: FRENCH
(with effect from 2018-2019)

SEMESTER I

Title of the Paper : Prescribed text and grammar-I

Prescribed textbook:

- Régine Mérieux & Yves Loiseau, *Latitudes 1*, Paris, Didier, 2017 (Units 1-6 only).

Questions not to be asked from the Autoévaluation and Préparation au DELF

Paper setters to strictly adhere to the syllabus and ask questions only from the pages included in the syllabus. Questions should cover the entire syllabus.

QUESTION PAPER PATTERN

Time : 3 Hours
Marks : 75

Maximum

Section A (7 x 5 = 35 Marks)

Answer any 7 questions

10 Grammar exercises to be given from the prescribed textbook

Section B (10 x 2 = 20 Marks)

Answer any TEN questions

15 questions to be asked on cultural aspects found in the prescribed textbook

Section C (2 x 10 = 20 Marks)

Answer any TWO

2 must be answered out of 4 topics (1 dialogue writing, 1 letter /email writing, 2 compositions based on the themes found in the prescribed textbook)



Communicative English

(For Students of Arts & Science Colleges)



Semester 1

TAMILNADU STATE COUNCIL FOR HIGHER EDUCATION
(TANSCHE)

CONTENTS

Semester 1

| Units | Page |
|---|-----------------|
| Unit I (20 hours) | 5 - 57 |
| 1. Listening and Speaking <ol style="list-style-type: none"> a. Introducing self and others b. Listening for specific information c. Pronunciation (without phonetic symbols) <ol style="list-style-type: none"> i. Essentials of pronunciation ii. American and British pronunciation iii. | 6 - 18 |
| 2. Reading and Writing <ol style="list-style-type: none"> a. Reading short articles – newspaper reports / fact based articles <ol style="list-style-type: none"> i. Skimming and scanning ii. Diction and tone iii. Identifying topic sentences b. Reading aloud: Reading an article/report c. Journal (Diary) Writing | 19 - 31 |
| 3. Study Skills - 1 <ol style="list-style-type: none"> a. Using dictionaries, encyclopaedias, thesaurus | 32 - 34 |
| 4. Grammar in Context: <p style="margin-left: 20px;">Naming and Describing</p> <ul style="list-style-type: none"> • Nouns & Pronouns • Adjectives | 35 - 57 |
| Unit II (20 hours) | 58 - 122 |
| 1. Listening and Speaking <ol style="list-style-type: none"> a. Listening with a Purpose b. Effective Listening c. Tonal Variation d. Listening for Information e. Asking for Information f. Giving Information | 58 - 67 |
| 2. Reading and Writing <ol style="list-style-type: none"> 1. a. Strategies of Reading: <ol style="list-style-type: none"> Skimming and Scanning b. Types of Reading : | 68 - 93 |

| | |
|--|---|
| <p>Extensive and Intensive Reading</p> <ul style="list-style-type: none"> c. Reading a prose passage d. Reading a poem e. Reading a short story <p>2. Paragraphs: Structure and Types</p> <ul style="list-style-type: none"> a. What is a Paragraph? b. Paragraph structure c. Topic Sentence d. Unity e. Coherence f. Connections between Ideas: Using Transitional words and expressions g. Types of Paragraphs <p>3. Study Skills II: Using the Internet as a Resource</p> <ul style="list-style-type: none"> a. Online search b. Know the keyword c. Refine your search d. Guidelines for using the Resources e. e-learning resources of Government of India f. Terms to know <p>4. Grammar in Context Involving Action-I</p> <ul style="list-style-type: none"> a. Verbs b. Concord | <p>94 - 101</p> <p>102 - 122</p> |
| <p>Unit III (16 hours)</p> <p>1. Listening and Speaking</p> <ul style="list-style-type: none"> a. Giving and following instructions b. Asking for and giving directions c. Continuing discussions with connecting ideas <p>2. Reading and writing</p> <ul style="list-style-type: none"> a. Reading feature articles (from newspapers and magazines) b. Reading to identify point of view and perspective (opinion pieces, editorials etc.) c. Descriptive writing – writing a short descriptive essay of two to three paragraphs. <p>3. Grammar in Context: Involving Action – II</p> | <p>123 - 157</p> <p>124 - 132</p> <p>133 - 144</p> |

| | |
|---|------------------|
| <ul style="list-style-type: none"> • Verbals - Gerund, Participle, Infinitive • Modals | 145 – 157 |
| Unit IV (16 hours) | 158 - 198 |
| 1. Listening and Speaking <ul style="list-style-type: none"> a. Giving and responding to opinions | 159 - 163 |
| 2. Reading and writing <ul style="list-style-type: none"> a. Note taking b. Narrative writing – writing narrative essays of two to three paragraphs | 164 - 189 |
| 3. Grammar in Context: <p style="margin-left: 20px;">Tense</p> <ul style="list-style-type: none"> • Present • Past • Future | 190 - 198 |
| Unit V (18 hours) | 199 - 231 |
| 1. Listening and Speaking <ul style="list-style-type: none"> a. Participating in a Group Discussion | 199 - 203 |
| 2. Reading and writing <ul style="list-style-type: none"> a. Reading diagrammatic information – interpretations maps, graphs and pie charts b. Writing short essays using the language of comparison and contrast | 204 - 216 |
| 3. Grammar in Context: Voice (showing the relationship between Tense and Voice) | 217 - 231 |

UNIVERSITY OF MADRAS
U.G. DEGREE COURSE
SYLLABUS WITH EFFECT FROM 2020-2021

BMA-CSA01

ALLIED MATHEMATICS-I

Credits: 5

Year: I/II, Sem:I/III

LEARNING OUTCOMES:

- Students gain knowledge about basic concepts of Algebra, Theory of Equations, Matrices, Trigonometry and Calculus.

UNIT I

Algebra And Numerical Methods:

Algebra: Summation of series - simple problems.

Numerical Methods: Operators E, Δ, ∇ , difference tables- Newton-Raphson method- Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula.

Chapter 2, Section 2.1.3, 2.2, 2.2.1, 2.3, 2.3.3

Chapter 3, Section 3.4.1 and Chapter 5, Section 5.1 and 5.2.

UNIT II

Matrices: Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) – verification- Computation of inverse of matrix using Cayley - Hamilton theorem.

Chapter 4, Section 4.1.1 to 4.1.6, 4.5, 4.5.2, 4.5.3.

UNIT III

Theory Of Equations: Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation-simple problems.

Chapter 3, Section 3.1 to 3.4.1(omit section 3.2.1)

UNIT IV

Trigonometry: Expansions of $\sin(n\theta)$ and $\cos(n\theta)$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin^n\theta$, $\cos^n\theta$, $\tan^n\theta$ in a series of sines, cosines and tangents of multiples of " θ " - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of " θ " – Hyperbolic and inverse hyperbolic functions .

Chapter 6, Section 6.1 to 6.3.

UNIVERSITY OF MADRAS
U.G. DEGREE COURSE
SYLLABUS WITH EFFECT FROM 2020-2021

UNIT V

Differential Calculus: Successive differentiation, n^{th} derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables- Simple problems

Chapter 1, Section 1.1 to 1.3.1 and 1.4.3.

Content and treatment as in

Allied Mathematics, Volume I and II, by P. Duraipandian and S. Udayabaskaran, S. Chand Publications

Reference:-

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

1. <http://www.themathpaage.com>
2. <http://nptel.ac.in>

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

BCE-CSC01

CORE-I: PROBLEM SOLVING USING PYTHON
(Common paper to B.Sc.Software Applications & B.C.A.)

I YEAR / I SEM

OBJECTIVES:

- 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.

OUTCOMES:

- To Understand the principles of Python and acquire skills in programming in python
- To develop the emerging applications of relevant field using Python
- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
- Able to develop simple turtle graphics programs in Python

UNIT – 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.

UNIT - 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 Flags and Indefinite Loops. Lists: List Structures - Lists in Python - Iterating over lists in Python.

UNIT - 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.

UNIT - V

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 - String Processing - Exception Handling.

UNIT - V

Dictionaries and Sets: Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism. Recursion: Recursive Functions.

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

TEXT BOOK:

1. Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem solving Focus”, Wiley India Edition, 2015.

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, 1st Edition.
3. Allen Downey, Jeffrey Elkner, Chris Meyers, “*How to think like a computer scientist: learning with Python*”, 2012.
4. Sheetal Taneja & Naveen kumar, “*Python Programming a Modular approach – A Modular approach with Graphics, Database, Mobile and Web applications*”, Pearson, 2017.
5. Ch Satyanarayana M Radhika Mani, B N Jagadesh, “*Python programming*”, Universities Press 2018.

WEB REFERENCES

- <http://interactivepython.org/courselib/static/pythonds>
- <http://www.ibiblio.org/g2swap/byteofpython/read/>
- <http://www.diveintopython3.net/>
- <http://greenteapress.com/wp/think-python-2e/>
- NPTEL & MOOC courses titled Python programming
- http://spoken-tutorial.org/tutorial-search/?search_foss=Python&search_language=English
- <http://docs.python.org/3/tutorial/index.html>

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

BCE-CSC02

CORE II :PRACTICAL – I PROBLEM SOLVING USING PYTHON
LAB(Common paper to B.Sc.Software Applications & B.C.A.)

I YEAR / I SEM

OBJECTIVES:

- To implement the python programming features in practical applications.
- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries , turtles, Files and modules.

OUTCOMES:

- Understand the numeric or real life application problems and solve them.
- Apply a solution clearly and accurately in a program using Python.
- Apply the best features available in Python to solve the situational problems.

LIST OF EXERCISES:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. 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 | |
3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number using recursive function.
6. Write a Python program to count the number of even and odd numbers from array of N numbers.
7. Python function that accepts a string and calculate the number of upper case letters and lower case letters.
8. Python program to reverse a given string and check whether the give string is palindrome or not.
9. Write a program to find sum of all items in a dictionary.

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

10. Write a Python program to construct the following pattern, using a nested loop

```
1
22
333
4444
55555
666666
7777777
88888888
999999999
```

11. Read a file content and copy only the contents at odd lines into a new file.

12. Create a Turtle graphics window with specific size.

13. Write a Python program for Towers of Hanoi using recursion

14. Create a menu driven Python program with a dictionary for words and their meanings.

15. Devise a Python program to implement the Hangman Game.

PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES

OBJECTIVES:

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

LEARNING OUTCOMES:

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

(Outcomes based on guidelines in UGC LOCF – Generic Elective)

UNIT 1: COMMUNICATION

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

B) Adjective Endings

C) Verb Endings

UNIT 2: DESCRIPTION

Listening – Listening to process description

Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication

Reading – Reading passages on products, equipment and gadgets

Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)

Picture Description – Description of Natural Phenomena

Grammar in Context: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

UNIT 3: NEGOTIATION STRATEGIES

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject-specific)

Reading – longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)

Grammar in Context: Active voice & Passive voice – If conditional - Collocations – Phrasal verbs

UNIT 4: PRESENTATION SKILLS

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking – Short speech

- Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field / Short poems / Short biography.

Writing - Writing Recommendations

Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

UNIT 5: CRITICAL THINKING SKILLS

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions

SUGGESTED ACTIVITIES

UNIT 1

Listening: Links for formal conversation can be given - Gap filling exercises – Multiple Choice questions – Making notes.

Speaking - Role play activity

Reading – Note making. Note-Taking.

Writing: Guided Writing (developing hints)

Email

Grammar: Vocabulary – Worksheets – Games.

UNIT 2

Listening-

Process Descriptions (Processes of Condensation and Evaporation./Process of Measuring the thickness of a wire using a Screw -Gauge./process of Exaction of sugar from sugarcane)

Speaking – Role Play

Reading – Multiple choice questions - Evaluative answers – Classifying and labeling

Writing - Picture description – Description of natural phenomena (rainbow, earthquake, volcanic eruption, erosion, natural disasters in 150 to 200 words).

Vocabulary: Expansion of compound nouns

UNIT 3

Listening- Gap fill exercises – Listening comprehension

Speaking -Debates

Reading -Reading comprehension

Writing – Essay Writing

Grammar - Vocabulary, Activities, Worksheets & Games.

UNIT 4

Listening - Note taking (of listening & viewing items) - Filling a table based on the listening item.

Speaking – JAM, Presentations. (PPT-TECHNICAL)

Reading-Reading comprehension

Writing– Difference between recommendations and instructions

Questions/MCQs based on graphs/flow diagrams/charts

Grammar: Vocabulary – Activities, Worksheets & Games.

UNIT 5

Listening – Radio News/ TV-News telecast /

Speaking - Watch or listen to documentaries and ask questions

Reading - Reading motivational stories (success stories in subject area)

Writing - Essay writing.

Grammar -Vocabulary –Activities, Worksheets & Games

UNIVERSITY OF MADRAS
UG – NON-MAJOR ELECTIVE COURSE
OFFERED IN THE DEPARTMENT OF COMMERCE
SYLLABUS WITH EFFECT FROM 2020-2021

BGE-NME03

BASICS OF HEALTH CARE MANAGEMENT

Objectives:

- To help the students to know about Health care Management.
- To train the students to acquire Family and Communal health'

Out comes:

Train the students to overcome the Health problems.

UNIT I: PERSONAL (SELF) HEALTH CARE

Personal Hygiene – Personal Diet pattern – Self health maintenance by yoga and other spiritual practice – Drills

UNIT II: FAMILY HEALTH CARE

Family hygiene – group health care by vaccination – propitiation and prevention – Sanitation and diet patterns

UNIT III: COMMUNAL HEALTH CARE

Mass – Hygiene (Social Hygiene) – Environmental Hygiene - Communal health care centres – Hospitals – Statistical bodies - Government and Non government organizations (NGO) for propagation of nutritious diet patterns - maintained by voluntary health organizations and government schemes.

UNIT IV: HEALTH AWARENESS

Health awareness programme organized by governmental and non governmental agencies. Communal amenity programme.

UNIT V: HEALTH DISASTER MANAGEMENT

First Aid – Disaster management techniques like epidemic eruption control, management and eradication.

BOOK REFERENCE:

1. Social and preventive Medicine, K. Park, Brimnot publishers

UNIVERSITY OF MADRAS
U.G. DEGREE COURSES

சிறப்புத் தமிழ் (Advanced Tamil)

முதற் பருவம்

2 மதிப்பீடுகள்

I. நாட்டுப் புறப்பாடல்

1. பஞ்சம்
2. மானம் விடிவதெப்போ?

II. புனை கதை

1. "கட்டை விரல்" - சி.என்.அண்ணாதுரை

III. புதுக்கவிதை

1. ஆடிக்காற்றே-சிற்பி
2. கடமையைச் செய்-மீரா
3. இழந்தவர்கள்-அப்துல் ரகுமான்

IV. மொழித்திறன்

1. கலைச்சொல்லாக்கம்
2. பொருந்தியச் சொல் தருதல்
3. பிழை நீக்கி எழுதுதல்

UNIVERSITY OF MADRAS
U.G. DEGREE COURSES

அடிப்படைத் தமிழ்ப் பாடம் (BASIC TAMIL)

முதற் பருவம்

2 மதிப்பீடுகள்

தமிழ் மொழியில் அடிப்படைக் கூறுகள்

1. எழுத்துக்கள்: முதல் எழுத்துக்கள்

1. உயிர எழுத்து, ஆய்த எழுத்து
2. மெய் எழுத்து
3. உயிர் மெய் எழுத்து

2. சொற்கள்

1. பெயர் சொல்
2. வினை சொல்
3. இடை சொல்
4. உரி சொல்

3. தொடரமைப்பு

1. எழுவாய்
2. பயனிலை
3. செயப்படுப் பொருள்

4. (a) பிழை நீக்கம்

1. ஒற்றுப் பிழை
2. எழுத்துப் பிழை
3. தொடர் பிழை

(b) எண்கள் (Numerals), உறவுப் பெயர்கள், வாழ் இடங்களும், பொருள்களும்

5. அறிமுகம்

1. விழாக்கள்
2. இயற்கை
3. உணவு முறைகள்-சுவை-காய்கள்-பழங்கள்

NOTE:

The mode of conduct of Examination for Part-IV-Basic Tamil (I&II Semesters) are as follows:

அடிப்படைத் தமிழுக்கு விடையைத் தேர்ந்தெடுத்தல் முறையின்படி (objective type) 50 வினாக்கள் கொடுக்கப்பட வேண்டும். ஒவ்வொரு வினாவிற்கும் 2 மதிப்பெண்கள் வீதம் எழுத்துத் தேர்வில் 100க்கு மதிப்பெண்கள் வழங்கி பின்னர் 75க்கு மாற்றம் செய்ய வேண்டும். அகமதிப்பீட்டிற்கு உள்ள 25 மதிப்பெண்களுடன் எழுத்துத் தேர்வு மதிப்பெண்ணையும் சேர்த்து 100க்கு மொத்தமாக வழங்கலாம்.

சென்னைப்பல்கலைக்கழகப்பாடத்திட்டமாற்றம்

2020 ஆம்கல்வியாண்டுமுதல்

பொதுத்தமிழ் – (Foundation Course)

B.A./B.Sc./B.Com.,

BFC-LT002

பொதுத்தமிழ்இரண்டாம்பருவம்

மொத்தமதிப்பெண்கள் – 75

பாடப்பகுப்பு

- I. இலக்கியம்
- II. அதைச்சார்ந்ததமிழிலக்கியவரலாறு
- III. மொழிப்பயிற்சி

அலகு 1

1. நற்றிணை – 61 , 88
2. குறுந்தொகை -87,88,89
3. கலித்தொகை – 11 ஆம்பாடல் – அரிதாயஅறன்எய்தி

அலகு 2

1. அகநானூறு – 86 ஆம்பாடல் (உழுந்துதலைபெய்த)
2. ஐங்குறுநூறு – கிள்ளைப்பத்து
3. பரிபாடல் –செவ்வேள் 5 (கடுவன்இளவெயினார் (1 முதல் 10 வரிகள் – வெற்றிவேல்)

அலகு 3

1. புறநானூறு – 48, 292
2. பதிற்றுப்பத்து –காக்கைப்பாடினியார்,நச்செள்ளையார்பாடல்கள் (56, 57)

அலகு 4

1. பத்துப்பாட்டு-முல்லைப்பாட்டு (முழுவதும்)

அலகு 5

1. திருக்குறள் – பொருட்பால் - 3 அதிகாரம் (காலமறிதல், சுற்றந்தழால், கண்ணோட்டம்)
2. நாலடியார் –ஈகை(முதல் 5 பாடல்கள்)

II தமிழிலக்கியவரலாறு

1. முச்சங்கவரலாறு , பதினெண்மேற்கணக்குநூல்கள்
(எட்டுத்தொகை, பத்துப்பாட்டு)
2. பதினெண்கீழ்க்கணக்குநூல்கள்

III மொழிப்பயிற்சி

1. இலக்கணக்குறிப்பு (வேற்றுமைத்தொகை, உவமைத்தொகை, பண்புத்தொகை, உம்மைத்தொகை, அன்மொழித்தொகை)
[பத்தியிலிருந்துஇலக்கணக்குறிப்புகளைக்கண்டறிதல்]
2. ஒற்றுமிகும்மிகாஇடங்கள்
3. மரபுத்தொடர்கள்(தமிழ்மரபுத்தொடர்களைக்கண்டறிதல்)

மதிப்பெண்பங்கீடு –

I & II இலக்கியம் – 50

III. மொழிப்பயிற்சி - 25

UNIVERSITY OF MADRAS
UG & 5 YR INTEGRATED DEGREE COURSES
SYLLABUS – OTHER LANGUAGES

I YEAR – II SEMESTER

PAPER – II – ONE ACT PLAY, SHORT STORY & TRANSLATION

I. ONE ACT PLAY (Detailed Study): AATH EKANKI

Edited By: Devendra Raj Ankur, Mahesh Aanand

Vani prakashan, 4695, 21-A Dariyagunj,; New Delhi – 110 002

LESSONS PRESCRIBED :

1. Aurangazeb ki Aakhari Raat
2. Laksmi Ka Swagat
3. Basant Ritu ka Naatak
4. Bahut Bada Sawal

II. SHORT STORIES (Non- Detailed Study): SWARNA MANJARI

Edited by: Dr. Chitti. Annapurna

Rajeswari Publications

21/3, Mothilal Street, (Opp. Ranganathan Street),

T. Nagar, Chennai – 600 017.

LESSONS PRESCRIBED :

1. Mukthidhan
2. Mithayeewala
3. Seb aur Dev
4. Vivah ki Teen Kathayen

III. TRANSLATION PRACTICE : (English to Hindi)

BOOKS FOR REFERENCE :

1. Prayojan Moolak Hindi : Dr. Syed Rahamathulla
Poornima Prakashan, 4/7, Begum III Street,
Royapettah, Chennai – 14.
2. Anuvad Abhyas Part III Dakshin Bharat Hindi Prachar Sabha
T. Nagar, Chennai -17.

UNITISED SYLLABUS

UNIT – I

1. Auranzeb ki Aakhiri Raat
2. Mukthidhan
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT – II

1. Laksmi ka Swagat
2. Mithayeewala
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIVERSITY OF MADRAS
UG & 5 YR INTEGRATED DEGREE COURSES
SYLLABUS – OTHER LANGUAGES

SEMESTER II

Foundation Course: Paper II-French II

Title of the Paper : Prescribed text and grammar-II

Prescribed textbook:

- Régine Mérieux & Yves Loiseau, *Latitudes 1*, Paris, Didier, 2017 (**Units 7-12 only**).

Questions not to be asked from the Autoévaluation and Préparation au DELF

Paper setters to strictly adhere to the syllabus and ask questions only from the pages included in the syllabus. Questions should cover the entire syllabus.

QUESTION PAPER PATTERN

Time : 3 Hours

Maximum Marks : 75

Section A (7 x 5 = 35 Marks)

Answer any 7 questions

10 Grammar exercises to be given from the prescribed textbook

Section B (10 x 2 = 20 Marks)

Answer any TEN questions

15 questions to be asked on cultural aspects found in the prescribed textbook

Section C (2 x 10 = 20 Marks)

Answer any TWO

2 must be answered out of 4 topics (1 dialogue writing, 1 letter /email writing, 2 compositions based on the themes found in the prescribed textbook)

UNIVERSITY OF MADRAS
U.G. DEGREE COURSE
SYLLABUS WITH EFFECT FROM 2020-2021

BMA-CSA02

ALLIED MATHEMATICS –II

Credits: 5

Year: I/II, Sem:II/IV

LEARNING OUTCOMES:

- Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.

UNIT I

Integral Calculus: Bernoulli's formula – Reduction formulae- $\int_0^{\pi/2} \sin^n x dx$, $\int_0^{\pi/2} \cos^n x dx$, $\int_0^{\pi/2} \sin^m x \cos^n x dx$ (m, n being positive integers), Fourier series for functions in $(0, 2\pi)$, $(-\pi, \pi)$.

Chapter 2: Section 2.7 & 2.9, Chapter 4: Section 4.1.

UNIT II

Differential Equations:

Ordinary Differential Equations: second order non-homogeneous differential equations with constant coefficients of the form $ay'' + by' + cy = X$ where X is of the form $e^{\alpha x} \cos \beta x$ and $e^{\alpha x} \sin \beta x$ -Related problems only.

Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving Lagrange's linear equation $Pp + Qq = R$.

Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4

UNIT III

Laplace Transforms: Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to second order- simple problems.

Chapter 7: Section 7.1.1 to 7.1.4 & 7.2 to 7.3

UNIT IV

Vector Differentiation: Introduction, Scalar point functions, Vector point functions, Vector differential operator Gradient, Divergence, Curl, Solenoidal, irrotational, identities.

Chapter 8, Section 8.1 to 8.4.4

UNIT V

Vector Integration: Line, surface and volume integrals, Gauss, Stoke's and Green's theorems (without proofs). Simple problems on these.

Chapter 8, Section 8.5 to 8.6.3.

UNIVERSITY OF MADRAS
U.G. DEGREE COURSE
SYLLABUS WITH EFFECT FROM 2020-2021

Content and treatment as in

Allied Mathematics, Volume I and II , P. Duraipandian and S. Udayabaskaran, S. Chand Publications.

Reference:-

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

1. <http://www.sosmath.com>
2. [http://www.anlyzemath.com/Differential Equations/applications.html](http://www.anlyzemath.com/Differential_Equations/applications.html)

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

BSA-CSC03

CORE-III: OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

(Common paper to B.C.A.)

I YEAR / II SEM

OBJECTIVES:

- To inculcate knowledge on Object-oriented programming concepts using C++.
- To gain Knowledge on programming with C++.

OUTCOMES:

- To write programs using OOP concepts like Abstraction, Encapsulation, Inheritance and Polymorphism

UNIT - I

Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If ..else, jump, goto, break, continue, Switch case statements - Loops in C++ : for, while, do - functions in C++ - inline functions – Function Overloading.

UNIT - II

Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

UNIT- III

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT - IV

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding, Polymorphism and Virtual Functions.

UNIT - V

Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

TEXT BOOK:

1. E. Balagurusamy, “*Object-Oriented Programming with C++*”, TMH 2013, 7th Edition.

REFERENCE BOOKS:

1. Ashok N Kamthane, “*Object-Oriented Programming with ANSI and Turbo C++*”, Pearson Education 2003.
2. Maria Litvin & Gray Litvin, “*C++ for you*”, Vikas publication 2002.

WEB REFERENCES:

- NPTEL & MOOC courses titled Object oriented programming concepts using C++
- <https://alison.com/course/introduction-to-c-plus-plus-programming>

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

BSA-CSC04

CORE-IV: PRACTICAL - II
C++ PROGRAMMING LAB
(Common paper to B.C.A.)

I YEAR / II SEM

OBJECTIVES:

- To implement the various object oriented programming concepts using C++

OUTCOMES:

- To understand the structure and model of the C++ programming language.
- To solve problems in C++ demonstrating Object Oriented Concepts

LIST OF EXERCISES:

1. Write a C++ program to demonstrate function overloading, Default Arguments and Inline function.
2. Write a C++ program to demonstrate Class and Objects
3. Write a C++ program to demonstrate the concept of Passing Objects to Functions
4. Write a C++ program to demonstrate the Friend Functions.
5. Write a C++ program to demonstrate the concept of Passing Objects to Functions
6. Write a C++ program to demonstrate Constructor and Destructor
7. Write a C++ program to demonstrate Unary Operator Overloading
8. Write a C++ program to demonstrate Binary Operator Overloading
9. Write a C++ program to demonstrate:
 - Single Inheritance
 - Multilevel Inheritance
 - Multiple Inheritance
 - Hierarchical Inheritance
 - Hybrid Inheritance
10. Write a C++ program to demonstrate Virtual Functions.
11. Write a C++ program to manipulate a Text File.
12. Write a C++ program to perform Sequential I/O Operations on a file.
13. Write a C++ program to find the Biggest Number using Command Line Arguments
14. Write a C++ program to demonstrate Class Template
15. Write a C++ program to demonstrate Function Template.
16. Write a C++ program to demonstrate Exception Handling.

UNIVERSITY OF MADRAS
UG – NON-MAJOR ELECTIVE COURSE
OFFERED IN THE DEPARTMENT OF COMMERCE
SYLLABUS WITH EFFECT FROM 2020-2021

BGE-NME05

CONCEPT OF SELF HELP GROUPS

Course Objectives

- To develop an understanding of the basic concepts of SHGS.
- To enable the students Understand the operative mechanisms of SHGS
- To Help the students to know about the various activities undertaken by SHGS
- To help the students to understand the concept of women empowerment through SHGS

OUT COME:

Students know to handle the SHG to develop the womens empowerment.

UNIT - I

Meaning, Concept and Functions of SHGS

UNIT - II

Women empowerment through SHGS

UNIT - III

Micro finance through SHGS

UNIT - IV

Social Development through SHGS

UNIT -V

Role of Govt. and NGO's in fostering SHGS

Bibliography

1. "Clinical approach to promotion of entrepreneurship" ED.Setty, Anmol publications Pvt., Ltd, New Delhi 2004.
2. "India economic Empowerment of Women", V.S. Ganesamurthy, New Century publications, New Delhi, 1st published – May 2007.
3. "Readings in Microfinance", N. Lalitha Dominant publishers and Distributors, New Delhi, 1st Edition 2008.
4. "Rural Credit and Self Help Groups, Micro finance needs & concepts in India", K.G.Karmakar, Sage publications, New Delhi, 1999.
5. "Rural empowerment through, SHGS, NGO's & PRI's S.B.Verma, Y.T. Pavar, Deep & Deep publications, New Delhi 2005.
6. "Women's Own; the Self help movement of Tamil Nadu". C.K. Gariyali, S.K. Vettivel, Vetri publishers, New Delhi, 2003.

Journals

1. Yoja na, A Development Monthly, Chief Editor Anurag Misra, Published by Ministry of information and Broad casting.
2. Kurukshetra, A Journal on Rural Development, Montly Journal, Editors; Kapil kumar, Lalitha Khurane published by Ministry of Rural Development.

UNIVERSITY OF MADRAS
U.G. DEGREE COURSES

சிறப்புத் தமிழ் (Advanced Tamil)

இரண்டாம் பருவம்

2 மதிப்பீடுகள்

I. கட்டுரை

1. பெண்ணின் பெருமை-திரு.வி.க

II. செய்யுள்

புறநானூறு

- அ. கெடுகசிந்தை-ஓக்கூர் மாசாத்தியார்
- ஆ. ஈன்று புறந்தருதல் - பொன்முடியார்
- இ. யாதும் ஊரோ - கனியண் பூங்குன்றனார்
- ஈ. திருகுறள் - வான் சிறப்பு முழுமையும்
- உ. சிலப்பதிகாரம் - மங்கல வாழ்த்துப் பாடல்
- ஊ. திருவாசகம் - வேண்டத்தக்கது
- எ. திருவாய்மொழி - உயர்வற
- ஏ. இரட்சண்ய யாத்ரிகம் (சிலுவைப்பாடு)-பாடல்எண்-1,3,4
- ஐ. சீறாப்புராணம் - வானவர்க்கும்
- ஓ. பாரதியார் - நல்லதோர் வீணை

III. இலக்கிய வரலாறு

பாடம் தழுவிய இலக்கிய வரலாறு

IV. மொழிப் பெயர்ப்பு

ஆங்கிலப் பகுதியை தமிழாக்கம் செய்தல்

UNIVERSITY OF MADRAS
U.G. DEGREE COURSES

அடிப்படைத் தமிழ்ப் பாடம் - (BASIC TAMIL)

இரண்டாம் பருவம்

2 மதிப்பீடுகள்

1. நீதி நூல்கள்

1. ஆத்திச் சூடி(1-12)
2. கொன்றை வேந்தன்(1-8)
3. திருக்குறள்(5)
 - I. அகர முதல (1)
 - II. செயற்கரிய (26)
 - III. மணத்துக்கண் (34)
 - IV. கற்க கசடறக்..... (391)
 - V. எப்பொருள் (423)

(இப்பகுதியில் 15 வினாக்கள் பாடம் தொடர்பாகவும், 5 வினாக்கள் பாடல் வரிகளை எழுதும் வகையில் அமைதல் வேண்டும்)

2. நீதி கதைகள்

1. பீர்பால் கதை
2. பரமாத் குரு கதை

3. அறிமுகம்

1. தமிழ் இலக்கிய வரலாறு - இலக்கியங்கள் புலவர்கள்
2. தமிழக வரலாறு - வரலாற்றுச் சின்னங்கள், சுற்றுலாத்தலங்கள், அலுவலகப் பெயர்கள்
3. பழமொழிகள்.

NOTE:

The mode of conduct of Examination for PART-IV - Basic Tamil (I & II Semesters) are as follows:

அடிப்படைத் தமிழுக்கு விடையைத் தேர்ந்தெடுத்தல் முறையின்படி (objective type) 50 வினாக்கள் கொடுக்கப்பட வேண்டும். ஒவ்வொரு வினாவிற்கும் 2 மதிப்பெண்கள் வீதம் எழுத்துத் தேர்வில் 100க்கு மதிப்பெண்கள் வழங்கி பின்னர் 75க்கு மாற்றம் செய்ய வேண்டும். அகமதிப்பீட்டிற்கு உள்ள 25 மதிப்பெண்களுடன் எழுத்துத் தேர்வு மதிப்பெண்ணையும் சேர்த்து 100க்கு மொத்தமாக வழங்கலாம்.

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

BCA-DSC05

CORE-V: DATA STRUCTURES

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
- <https://nptel.ac.in/courses/106106127/>

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

BCA-DSC06

CORE-VI: JAVA PROGRAMMING

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.

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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 Even 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

BCE-CSC03

CORE-III: COMPUTER ORGANIZATION

(Common paper to B.C.A.-III Sem.)

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

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", Cengage Learning, 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/>
- <https://nptel.ac.in/courses/106103068/>

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) Radix sort.

UNIVERSITY OF MADRAS
BCA-BACHELOR OF COMPUTER APPLICATIONS
WITH EFFECT FROM 2020-2021

BCA-DSA03

ALLIED PAPER -III - FINANCIAL ACCOUNTING

Course Objectives

Number of Credits :5

1. To enable the students to know the Principles of Accounting in General
2. To Understand the System of Keeping Financial Accounting Records

COURSE LEARNING OUT COMES:

After finishing this course students are well acquainted with Principles of accounting and well equipped in the system of keeping Financial Accounting Records.

| | | | |
|---------------------|---|-----------|--|
| Title of the Course | ALLIED PAPER III FINANCIAL ACCOUNTING | | |
| Allied | II Year & Third Semester | Credit: 4 | |
| Course outline | Unit-1: The Accounting structure: Basic accounting concepts and conversions - Accounting equation - Meaning of accounting - Groups interested in accounting information - trial balance, final accounts (emphasis to be given to important adjustments) - Rectification of errors - Suspense account | | |
| | Unit-2: Depreciation accounting - Meaning of depreciation - Methods of providing depreciation - Fixed percentage on original cost - Fixed percentage on diminishing balance (including change in the method of depreciation) Single entry : Definition and salient features Statement of affairs method - Conversion method. Average due date - Account current and investment accounts | | |
| | Unit-3: Branch Accounts: Debtors system - profit and Loss Accounts - Stock and debtors system - Distinction between wholesale profit and retail profit - Independent branch (foreign branch excluded) - Departmental Accounts: Basis for allocation of expenses - Inter departmental transfer at cost or selling price - Treatment of expenses which cannot be allocated. | | |
| | Unit-4: Hire purchase and Instalment purchase: Meaning and legal position - Accounting aspects - Default and re-possession - Hire purchase trading account - Instalment system - Accounting aspect. Sale or Return: Meaning and legal position - Accounting procedure under different circumstances. | | |
| | Unit-5 : Partnership Accounts: Section 13 of Indian Partnership Act - Fixed and fluctuating capital - Final accounts of firms - Admission of a partner - Retirement of a partner - Death of a partner - dissolution of partnership - Insolvency of a partner - (Garner Vs Murray) - Insolvency of all partners Gradual realization of assets and piecemeal distribution. | | |

Recommended Texts & Reference

1. Gupta R.L, Advanced Accountancy, S.Chand, Delhi.
2. Agarwala A.N, Higher Science of Accountancy, Kitab Mahal,Allahabad.
3. S.P. Jain and K.L. Narang, Financial Accounting
4. M.C.Shukla and T.S.Grawel, Adavnced Accounts(Vol. I)
5. Gillespie Accounting system, Procedure & methods, Prentice Hall India Ltd, New Delhi.

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.

Unit 5: Environmental Pollution (8 lectures)

- Environmental pollution: types, causes, effects and controls: Air, Water, soil and noise Pollution.
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste
- Pollution case studies.

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. Glesson, 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 & Security. Stockholm Env.Institute, Oxford Univ.Press.
5. Groom, Martha J., Gary K.Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates,2006.
6. Grumbine,R.Edward, and Pandit,M.K2013.Threats from India's Himalayas dams .Science,339:36-37
7. McCully,P.1996.Rivers no more :the environmental effects of dams(pp.29-64).Zed books.
8. McNeill,John R.2000.Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum,E.P.,Odum, H.T.& Andrees,J.1971.Fundamental of Ecology. Philadelphia Saunders.
10. Pepper,I.L.,Gerba,C.P & Brusseau,M.L.2011.Environmental and Pollution Science. Academic Press.
11. Rao,M.N.& Datta,A.K1987.Waste Water Treatment. Oxford and IBH Publishing Co.Pvt.Ltd.
12. Raven,P.H.,Hassenzahl,D.M & Berg,L.R.2012 Environment.8th edition. John Willey & sons.

UNIVERSITY OF MADRAS
U.G. DEGREE COURSE

13. Rosencranz, A., Divan,S.,& Noble, M.L.2001.Environmental law and policy in India. Tirupathi 1992.
14. Sengupta,R.2003.Ecology and Economics: An approach to sustainable development.OUP
15. Singh,J.S.,Singh,S.P and Gupta,S.R.2014.Ecology,Environmental Science and Conservation. S.Chand Publishing, New Delhi.
16. Sodhi,N.S.,Gibson,L.&Raven ,P.H(eds).2013.Conservation Biology :Voices from the Tropics. John Willey & Sons.
17. Thapar,V.1998.Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren,C.E.1971.Biology and water Pollution Control. WB Saunders.
19. Willson,E.O.2006. The Creation: An appeal to save life on earth..New York: Norton.
20. World Commission on Environment and Development.1987.Our Common Future. Oxford University 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:

- NPTEL & MOOC courses titled Computer Networks
- <https://nptel.ac.in/courses/106106091/>

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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.

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TEXT BOOK:

1. P.T.Joseph, S.J., “*E-Commerce - An Indian Perspective*”, PHI 2012, 4th Edition.

REFERENCE BOOKS:

1. David Whiteley , “*E-Commerce Strategy, Technologies and Applications*”, Tata McGraw Hill, 2001.
2. Ravi Kalakota, Andrew B Whinston, “*Frontiers of Electronic Commerce*”, Pearson 2006, 12th Impression.

WEB REFERENCES:

- <https://www.docsity.com/en/e-commerce-notes-pdf-lecture-notes-university-level/2484734/>
- <https://magnetoitsolutions.com/blog/advantages-and-disadvantages-of-ecommerce>
- [https://www.researchgate.net/publication/320547139ECommerce Merits and Demerits A Review Paper](https://www.researchgate.net/publication/320547139ECommerce_Merits_and_Demerits_A_Review_Paper)

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
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.

UNIVERSITY OF MADRAS
BCA-BACHELOR OF COMPUTER APPLICATIONS
WITH EFFECT FROM 2020-2021

BCA-DSA04
II/IV SEM.

ALLIED - IV - COST AND MANAGEMENT ACCOUNTING

OBJECTIVES:

- This Course introduces the concepts of Cost and Management Accounting.

OUTCOMES:

- To learn the theory and practices of cost accounting.
- To understand the concepts of management accounting.

UNIT - I

Cost Accounting: Definition, Meaning and Objectives – Distinction between Cost and Financial Accounting. Elements of cost and preparation of cost sheets and tender. Management Accounting – Definition and objectives – Distinction between management and Financial Accounting.

UNIT - II

Stores Records – Purchase Order – Goods Received. Note – Bin Card – Stores Ledger – Purchase, Receipt and Inspection – Inventory Control – ABC Analysis – Economic Ordering Quantity – Maximum, Minimum and Reordering levels – Methods of Pricing Issued.

UNIT - III

Labor: Importance of Labor Cost Control – Various Methods of Wage Payment – Calculation of Wages – Methods of Incentive for Schemes.

UNIT - IV

Overheads: Factory, Administration, Selling and Distribution of Overheads – Classification – Allocation and Apportionment – Redistribution (Secondary Distribution) – Absorption of Overheads including ‘Machine Hour Rate.

UNIT - V

Marginal Costing: The Concept – Break Even Analysis – Break – Even Chart – Importance and assumptions - Application of Profit Volumes Ratio – Budget and Budgetary Control: Procedure and Utility – Preparation of Different types of Budget including Flexible Budget.

RECOMMENDED TEXTS AND REFERENCE:

1. Wheldon A.J., Cost Accounting and Costing Methods.
2. Iyengar S.P., Cost Accounting: Principles and Practice.
3. Bhar B.K., Cost Accounting: Methods and Problems.
4. Bigg W.W., Cost Accounts.
5. Prasad N.K., Cost Accounting: Principles and Problems.
6. Jain S.P. and Narang K.L., Advanced Cost Accounting.
7. Agarwal M., Theory and Practices of Cost Accounting.
8. Robert Anthony: Management Accounting: Text and Cases.
9. Mageshwari S.N., Principles of Management Accounting.

WEB REFERENCES:

- NPTEL & MOOC courses titled Cost and Management Accounting.
- <https://pakaccountants.com/courses/managementaccounting/>
- <https://www.reed.co.uk/courses/diploma-in-cost-and-management-accounting/238067>

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.

Unit 5: Environmental Pollution (8 lectures)

- Environmental pollution: types, causes, effects and controls: Air, Water, soil and noise Pollution.
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste
- Pollution case studies.

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. Glesson, 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 & Security. Stockholm Env.Institute, Oxford Univ.Press.
5. Groom, Martha J., Gary K.Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates,2006.
6. Grumbine,R.Edward, and Pandit,M.K2013.Threats from India's Himalayas dams .Science,339:36-37
7. McCully,P.1996.Rivers no more :the environmental effects of dams(pp.29-64).Zed books.
8. McNeill,John R.2000.Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum,E.P.,Odum, H.T.& Andrees,J.1971.Fundamental of Ecology. Philadelphia Saunders.
10. Pepper,I.L.,Gerba,C.P & Brusseau,M.L.2011.Environmental and Pollution Science. Academic Press.
11. Rao,M.N.& Datta,A.K1987.Waste Water Treatment. Oxford and IBH Publishing Co.Pvt.Ltd.
12. Raven,P.H.,Hassenzahl,D.M & Berg,L.R.2012 Environment.8th edition. John Willey & sons.

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U.G. DEGREE COURSE

13. Rosencranz, A., Divan,S.,& Noble, M.L.2001.Environmental law and policy in India. Tirupathi 1992.
14. Sengupta,R.2003.Ecology and Economics: An approach to sustainable development.OUP
15. Singh,J.S.,Singh,S.P and Gupta,S.R.2014.Ecology,Environmental Science and Conservation. S.Chand Publishing, New Delhi.
16. Sodhi,N.S.,Gibson,L.&Raven ,P.H(eds).2013.Conservation Biology :Voices from the Tropics. John Willey & Sons.
17. Thapar,V.1998.Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren,C.E.1971.Biology and water Pollution Control. WB Saunders.
19. Willson,E.O.2006. The Creation: An appeal to save life on earth..New York: Norton.
20. World Commission on Environment and Development.1987.Our Common Future. Oxford University Press.

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 objected oriented analysis & design co
- 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:

- NPTEL online course – Software Engineering - <https://nptel.ac.in/courses/106105182/>

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.

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SYLLABUS WITH EFFECT FROM 2020-2021

REFERENCE BOOKS:

1. Abraham Silberchatz, Henry F. Korth, S. Sudarshan, “*Database System Concepts*”, McGrawHill 2019, 7th Edition.
2. Alexis Leon & Mathews Leon, “*Fundamentals of DBMS*”, Vijay Nicole Publications 2014, 2nd Edition.

WEB REFERENCES:

- NPTEL & MOOC courses titled Relational Database Management Systems
- <https://nptel.ac.in/courses/106106093/>
- <https://nptel.ac.in/courses/106106095/>

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:

- NPTEL & MOOC courses titled Operating Systems
- <https://nptel.ac.in/courses/106106144/>

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.

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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.

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SYLLABUS WITH EFFECT FROM 2020-2021

TEXT BOOK:

1. Information Security Principles and Practices by Mark S.Merkow and James Breithaupt, Second Edition, Pearson, 2014.

REFERENCE BOOKS:

1. Information Security: Principles and Practice by Mark Stamp, Second Edition, WILEY.2011
2. Introduction to Computer Security by Matt Bishop, Pearson, 2014

WEB REFERENCES:

- NPTEL & MOOC courses titled Information security
- <https://nptel.ac.in/courses/106106129/>

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

BSA-CSE1B

ELECTIVE-I(B): MULTIMEDIA AND ITS APPLICATIONS

(Common paper to B.C.A.)

III YEAR / V SEM

OBJECTIVES:

- To understand the basic concepts of Multimedia Systems
- To learn representations, perceptions and applications of Multimedia

OUTCOMES:

- To understand the technologies behind multimedia applications

UNIT- I

Definition - Classification - Multimedia application -Multimedia Hardware - Multimedia software - CDROM - DVD.

UNIT-II

Multimedia Audio: Digital medium - Digital audio technology - sound cards - recording - editing - MP3 - MIDI fundamentals - Working with MIDI - audio file formats - adding sound to Multimedia project.

UNIT-III

Multimedia Text: Text in Multimedia -Multimedia graphics: coloring - digital imaging fundamentals - development and editing - file formats - scanning and digital photography

UNIT-IV

Multimedia Animation: Computer animation fundamentals - Kinematics - morphing - animation s/w tools and techniques.

Multimedia Video : How video works - broadcast video standards - digital video fundamentals – digital video production and editing techniques - file formats.

UNIT-V

Multimedia Project : stages of project - Multimedia skills - design concept - authoring - planning and costing –Multimedia Team.

Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing

TEXT BOOKS:

1. S.Gokul, “*Multimedia Magic*”, BPB Publications, 2nd Edition.
2. Tay Vaughen , “*Multimedia Making it Work*”, TMH, 6th Edition.

REFERENCE BOOKS:

1. Kiran Thakrar, Prabhat k.andleigh, “*Multimedia System Design*”, Prentice Hall India.
2. Malay k Pakhira, “*Computer graphics, Multimedia and Animation*”, Prentice Hall India, 2nd Edition.

WEB REFERENCES:

- NPTEL & MOOC courses titled Multi media
- <https://nptel.ac.in/courses/106105163/>
- W3schools.com/html/html-media.asp

UNIVERSITY OF MADRAS
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SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSE1C

ELECTIVE-I(C): RESOURCE MANAGEMENT TECHNIQUES

III YEAR / V SEM

OBJECTIVE:

- To learn the basic concepts, models and statements of Operation Research theory which are frequently applied to business decision making.

OUTCOME:

- To make use of simplex method to solve optimization problems.
- To utilize PERT and CPM in project management.

UNIT-I:

Basics of Operations Research (OR): Characteristics of O.R - Necessity of O.R in Industry -OR and Decision making - Role of computers in O.R. Linear programming: Formulations and Graphical solution (of 2 variables) canonical & standard terms of Linear programming problem. Algebraic solution: Simplex method.

UNIT-II:

Algebraic solution: Charnes method of penalties - two phase simplex method - concept of Duality - properties of duality - Dual simplex method.

UNIT-III:

Transportation model: Definition - formulation and solution of transportation models - the row - minima, column - minima, matrix minima and vogel's approximation methods. Assignment model: Definition of Assignment model - comparison with transportation model- formulation and solution of Assignment model - variations of Assignment problem.

UNIT-IV:

Sequencing problem: Processing each of n jobs through m machines - processing n jobs through 2 machines - processing n jobs through 3 machines - processing 2 jobs through m machines - processing n jobs through m machines - travelling salesman problem. Game Theory: Characteristics of games -Maximin, Minimax criteria of optimality – Dominance property - algebraic and graphical method of solution of solving 2 x 2 games.

UNIT-V:

Pert - CPM: Networks - Fulkerson's Rule - measure of activity - PERT computation - CPM computation - resource scheduling. Simulation: Various methods of obtaining random numbers for use in computer simulation - Additive, multiplicative and mixed types of congruence random number generators - Monte Carlo method of simulation - its advantages and disadvantages.

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RECOMMENDED TEXTS:

1. Hamdy A. Taha, “*Operation Research - An Introduction*”, Prentice Hall of India, Pvt. Ltd. New Delhi 1996, 5th Edition
2. Ackoff R.L. and Sasieni M. W, “*Fundamentals of Operations Research*”, John Wiley and sons New York 1968.
3. Charnes A. Cooper W. and Hendersen A. , “ *Introduction to Linear Programming*”, Wiley and Sons New York 1953.
4. Srinath L.S, “PERT and CPM principles and applications”, Affiliated East West Press Pvt. Ltd. New York 1973.

WEB REFERENCES:

- <http://ocw.mit.in>
- <http://ebooks.Ipude.in.operationsresearch>

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
U.G. DEGREE COURSE

Books for Reference :

1. M.G. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003.
2. Chakravarthy, S.K: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
3. Satchidananda, M.K: Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991.
4. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D. Publications, New Delhi, 1995.
5. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi, 1999.
6. Ruhela, S.P.: Human Values and education, Sterling Publications, New Delhi, 1986.
7. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai, 1975.
8. NCERT, Education in Values, New Delhi, 1992.
9. Swami Budhananda (1983) How to Build Character A Primer : Rmakrishna Mission, New Delhi.
10. A Culture Heritage of India (4 Vols.), Bharatiya Vidya Bhuvan, Bombay, (Selected Chapters only)
11. For Life, For the future : Reserves and Remains – UNESCO Publication.
12. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
13. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.
14. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
15. Awakening Indians to India, Chinmayananda Mission, 2003.

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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 (DCOM)-Accessing HTML & CSS through DCOM 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 Mcgrath, “*Java Script*”, Dream Tech Press 2006, 1st Edition. (UNIT V: JAVASCRIPT)
3. Achyut S Godbole & Atul Kahate, “*Web Technologies*”, 2002, 2nd Edition. (UNIT V: AJAX)

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REFERENCE BOOKS:

- Laura Lemay, Rafe Colburn , Jennifer Kyrnin, “*Mastering HTML, CSS & Javascript Web Publishing*”, 2016.
- DT Editorial Services (Author), “*HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)*”, Paperback 2016, 2nd Edition.
- C. Xavier, “*World Wide Web Design with HTML*”, TMH Publishers 2001.
- Wendy Willard, “*A Beginners Guide HTML*”, Tata McGraw Hill 2009, 4th Edition.

WEB REFERENCES:

- NPTEL & MOOC courses titled Web Design and Development.
- <https://www.udemy.com/topic/web-design/>

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.Dunbam, “*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

Consuming Web Services Using HTTP-Consuming JSON Services- Creating Your Own Services - Binding Activities to Services -Understanding Threading .

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TEXT BOOK:

1. Jerome DiMarzio, “*Beginning Android Programming with Android Studio*”, 4th Edition.

REFERENCE BOOKS:

1. Dawn Griffiths, David Griffiths, “*Head First Android Development: A Brain-Friendly Guide*”, 2017.
2. Neil Smyth , “*Android Studio 3.0 Development Essentials: Android*”, 8th Edition.
3. Pradeep Kothari, “*Android Application Development (With Kitkat Support)*”, Black Book 2014.

WEB REFERENCES:

- <https://developer.android.com/guide>
- https://en.wikipedia.org/wiki/Android_10
- [Develop App for Free](#)
- <https://flutter.dev/>
- <http://ai2.appinventor.mit.edu>
- https://en.wikipedia.org/wiki/Android_version_history
- <https://aws.amazon.com/mobile/mobile-application-development/> (Unit 1)
- https://en.wikipedia.org/wiki/Mobile_app_development

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

BSA-CSE2A

ELECTIVE-II(A): DATA ANALYTICS USING R
(Common paper to BCA)

III YEAR / VI SEM

OBJECTIVE:

- To make the student understand the basic concepts of data analytics, be familiar with the data analytics life cycle, learn the basics of R Language, be exposed to data pre-processing, model creations and visualizing the results using R .

OUTCOMES:

- Write R program to pre-process the data for analytics.
- Understand the various methods to analyze the data and create models.
- Present the analytics results to using visualization techniques.

UNIT – I:

Introduction to Big Data Analytics - Big Data Overview - State of the Practice in Analytics-Key Roles for the New Big Data Ecosystem -Examples of Big Data Analytics - Data Analytics Lifecycle - Data Analytics Lifecycle Overview - Phase 1: Discovery -Phase 2: Data Preparation - Phase 3: Model Planning -Phase 4: Model Building -Phase 5: Communicate Results -Phase 6: Operationalize- What is R - Why R -Advantages of R Over Other Programming Languages- Handling Packages in R

UNIT – II:

Getting Started with R-Working with Directory- Data Types in R-Few Commands for Data Exploration-Challenges of Analytical Data Processing- Expression, Variables and Functions-Missing Values Treatment in R - Using the 'as Operator to Change the Structure of Data - Vectors -Matrices -Factors -List -Few Common Analytical Tasks- Aggregating and Group Processing of a Variable-Simple Analysis Using R- Methods for Reading Data-Comparison of R GUIs for Data Input- Using R with Databases and Business Intelligence

UNIT – III:

Exploring Data in R-Data Frames-R Functions for Understanding Data in Data frames-Load Data Frames-Exploring Data-Data Summary-Finding the Missing Values - Invalid Values and Outliers - Descriptive Statistics-Spotting Problems in Data with Visualization -Linear Regression Using R - Model Fitting - Linear Regression-Assumptions of Linear Regression-Validating Linear Assumption-Logistic Regression-What is Regression-Introduction to Generalized Linear Models-Logistic Regression- Binary Logistic Regression-Diagnosing Logistic Regression - Multinomial Logistic Regression Models

UNIT – IV:

Decision Tree-What is a Decision Tree-Decision Tree Representation in R-Appropriate Problems for Decision Tree Learning- Basic Decision Tree Learning Algorithm-Measuring Features-

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Hypothesis Space Search in Decision Tree Learning-Inductive Bias in Decision Tree Learning-Why Prefer Short Hypotheses - Issues in Decision Tree Learning-What is Time Series Data - Reading Time Series Data - Plotting Time Series Data - Decomposing Time Series Data-Forecasts using Exponential Smoothing-ARIMA Models .

UNIT – V:

Clustering -What is Clustering-Basic Concepts in Clustering- Hierarchical Clustering -k-means Algorithm-CURE Algorithm -Clustering in Non-Euclidean Space-Clustering for Streams and Parallelism - Association Rules - Frequent Itemset- Data Structure Overview - Mining Algorithm Interfaces - Auxiliary Functions-Sampling from Transactions-Generating Synthetic Transaction Data -Additional Measures of Interestingness - Distance based Clustering Transactions and Associations.

TEXT BOOKS:

1. “*Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data*”, EMC Education Services 2015.
2. Seema Acharya, “*Data Analytics using R*”, McGraw Hill Education 2018, 1st Edition.

REFERENCE BOOKS:

1. Anil Maheshwari, “*Data Analytics Made Accessible*”.
2. Michael Milton, “*Head First Data Analysis*”.
3. V.K.Jain, “*Data Science and Analytics*”.

WEB REFERENCES:

- <https://analytics.google.com/analytics/academy/course/6>
- <https://www.youtube.com/watch?v=D2YcHRiIzCk>

UNIVERSITY OF MADRAS
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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 GasIndustry, 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

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TEXT BOOK:

1. Vijay Madiseti and ArshdeepBahga, “*Internet of Things: (A Hands-on Approach)*”, Universities Press (INDIA) Private Limited 2014, 1st Edition.

REFERENCE BOOKS:

1. Michael Miller, “*The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World*”, Pearson Education 2015.
2. Francis da Costa, “*Rethinking the Internet of Things: A Scalable Approach to Connecting Everything*”, Apress Publications 2013, 1st Edition.
3. Walteneagus Dargie, Christian Poellabauer, “*Fundamentals of Wireless Sensor Networks: Theory and Practice*”, **Wiley 2014.**
4. CunoPfister, “*Getting Started with the Internet of Things*”, O’Reilly Media 2011.

WEB REFERENCES:

- <https://github.com/connectIOT/iottoolkit>
- <https://www.arduino.cc/>
- <http://www.zettajs.org/>

UNIVERSITY OF MADRAS
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SYLLABUS WITH EFFECT FROM 2020-2021

BCA-DSE2C

ELECTIVE-II(C): SOFTWARE PROJECT MANAGEMENT

III YEAR / VI SEM

OBJECTIVES:

- To define and highlight importance of software project management.
- To formulate and define the software management metrics & strategy in managing projects

OUTCOMES:

- Knowledge gained to train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process

UNIT - I

Introduction to Competencies - Product Development Techniques - Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM - International Organization for Standardization.

UNIT - II

Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project -Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.

UNIT - III

Tasks and Activities - Software Size and Reuse Estimating - The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures - COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model - Organizational Planning - Project Roles and Skills Needed.

UNIT - IV

Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling.

UNIT - V

Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software - Case Study

TEXT BOOK:

1. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, “*Quality Software Project Management*”, Pearson Education Asia 2002.

REFERENCE BOOKS:

1. Pankaj Jalote, “*Software Project Management in Practice*”, Addison Wesley 2002.
2. Hughes, “*Software Project Management*”, Tata McGraw Hill 2004, 3rd Edition.

WEB REFERENCES:

- NPTEL & MOOC courses titled Software Project Management
- www.smartworld.com/notes/software-project-management

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BCE-CSC18

CORE-XVIII: PRACTICAL - VIII
MINI PROJECT
(Common paper to B.Sc.Software Applications & B.C.A.)

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 a 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.

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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/BSc Software Applications of XXX College"** with dated signature of internal guide, external guide and also Head of the Department/ College.

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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/Software Applications) / 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 60 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
