MANONMANIAM SUNDARANAR UNIVERISTY,
TIRUNELVELI-12

# SYLLABUS

## UG - COURSES – AFFILIATED COLLEGES

Course Structure for BCA

(Choice Based Credit System)

(with effect from the academic year 2021-2022 onwards )

| Semester-IV | | | | |
|---|---|---|---|---|
| **Part** | **Subject Status** | **Subject Title** | **Subject Code** | **Credit** |
| I | Language | TAMIL/MALAYALAM/HINDI | C1TL41/ C1MY41/ C1HD41 | 4 |
| II | Language | ENGLISH | C2EN41 | 4 |
| III | Core | RESOURCE MANAGEMENT TECHNIQUES | CMCA43 | 4 |
| III | Major Practical IV | PYTHON PROGRAMMING LAB | CMCAP4 | 2 |
| III | Allied IV | ACCOUNTING SOFTWARE - TALLY | CACA41 | 3 |
| III | Allied Practical IV | TALLY LAB | CACAP4 | 2 |
| III | Skill Based | MICRO PROCESSOR | CSCA41 | 4 |
| IV | Non Major Elective | FUNDAMENTALS OF STATISTICS– II/ ARIMUGA TAMIL PAPER - II | CNMA42 / CNTL41 | 2 |
| IV | Common | COMPUTER FOR DIGITAL ERA | | 2 |
| V | Extension Activity | NCC, NSS, YRC, YWF | C5EA41 | 1 |

**Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks**

A. **Scheme for internal Assessment**:
Maximum marks for written test: **20 marks**
**3 internal tests**, each of **I hour** duration shall be conducted every semester.
To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be:
Written test- 20 marks; Assignment -5 marks Total - 25 marks

**B. Scheme of External Examination**
**3 hrs.** examination at the end of the semester
A – Part : 1 mark question two - from each unit
B – Part : 5 marks question one - from each unit
C – Part : 8 marks question one - from each unit

- **Conversion of Marks into Grade Points and Letter Grades**

| S.No | Marks | Letter Grade | Grade point (GP) | Performance |
|---|---|---|---|---|
| 1 | 90-100 | O | 10 | Outstanding |
| 2 | 80-89 | A+ | 9 | Excellent |
| 3 | 70-79 | A | 8 | Very Good |
| 4 | 60-69 | B+ | 7 | Good |
| 5 | 50-59 | B | 6 | Above Average |
| 6 | 40-49 | C | 5 | Pass |
| 7 | 0-39 | RA | - | Reappear |
| 8 | 0 | AA | - | Absent |

- **Cumulative Grade Point Average (CGPA)**

$$\mathbf{CGPA} = \frac{\mathbf{\Sigma\,(GP \times C)}}{\mathbf{\Sigma C}}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

- **Classification**
  a) First Class with Distinction : CGPA $\geq$ 7.5*****
  b) First Class : CGPA $\geq$ 6.0
  c) Second Class : CGPA $\geq$ 5.0 and $<$ 6.0
  d) Third Class : CGPA $<$ 5.0

# பொதுத்தமிழ்

| | | |
|---|---|---|
| **பாடத்திட்டத்தின் நோக்கங்கள் ( Course Objectives)**<br>**சங்க இலக்கியத்தின் சிறப்புகளை உணர வைத்தல்** | | |
| **எதிர்பார்க்கும் படிப்பின் முடிவுகள் (Expected Course Outcomes)** | | |
| CO1 | மாணவர் பண்டைத் தமிழரின் பண்பாட்டினை அறிந்து கொள்வர் | $K_1, K_4, K_6$ |
| CO2 | வாழ்வியலுக்கான பொருள் இலக்கணத்தைக் கற்றுக் கொள்வர் | $K_2, K_5$ |
| CO3 | இலக்கியங்கள் வாயிலாக வாழ்வியல் அறங்களைப் புரிந்து கொள்வர். | $K_1, K_3, K_5$ |
| CO4. | வரலாற்றுப் பின்புலங்களை மையமாகக் கொண்டு நாடகங்கள் படைக்கும் உந்துதலைப் பெறுவர். | $K_2, K_6$ |
| CO5 | சங்க இலக்கியங்களின் வரலாற்றையும், தனிச்சிறப்புகளையும் அறிந்து கொள்வர். | $K_2, K_5$ |
| **K1 – நினைவில் கொள்ளுதல் (Remember) K2 – புரிந்து கொள்ளுதல் (understand) K3 – விண்ணப்பித்தல்(Apply) K4 – பகுத்தாய்தல் ( Analyze) K5 – மதிப்பிடு** | | |

**அலகு:1 - செய்யுள்**

நற்றிணை முதல் பட்டினப்பாலை வரை

நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்., திருநெல்வேலி-1

தொலைபேசி எண்: 0462 2323990

**அலகு:2 - இலக்கணம்**

1. பொருள் இலக்கணம்
2. ஓரெழுத்து ஒருமொழிகள்
3. மரபுச் சொற்கள்
4. பிறமொழிச் சொற்களை நீக்கி எழுதுதல்

**அலகு:3 - உரைநடை**

வாழ்வியல் அறம் - தொகுப்பாசிரியர் - முனைவர் ச.பொ.சீனிவாசன்

நெஸ்லிங் புக்ஸ் பப்ளிஷpங் அன்ட் டிஸ்ட்ரிபிêட்டர்ஸ் (பி) லிட்., சென்னை -50

தொலைபேசி எண் : 044-26251968, 26258410, 48601884

**அலகு:4 - நாடகம்**

ஆதி அத்தி – ஆசிரியர் - பெ.தூரன் - பதிப்பாசிரியர் - முனைவர் சொ.சேதுபதி

நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்., சென்னை -50

தொலைபேசி எண் : 044-26251968, 26258410, 48601884

**அலகு:5 - இலக்கிய வரலாறு**

1. எட்டுத்தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்
3. சங்க இலக்கியங்களின் சிறப்பியல்புகள்

**மேற் பார்வை நூல்கள்**

இலக்கணம் : புறப்பொருள் வெண்பாமாலை

இலக்கிய வரலாறு : ஆசிரியர் முனைவர் சி. பாலசுப்பிரமணியன்.

பாவை பப்ளிகேஷன்ஸ் 142இ ஜானி ஜான் கான் சாலை இராயப்பேட்டை

சென்னை – 14 தொலைபேசி எண் : 28482441

முனைவர் பெ. சுயம்பு

பாரதி பதிப்பகம் 113இ இராஜீவ் தெரு திசையன்விளை -57

தொலைபேசி எண் :04637 - 272096

மாணவர்களைக் களஆய்விற்கு அழைத்துச் செல்லலாம்

**Mapping with Programme Outcomes**

| $CO_S$ | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | S | M | S | M | S |
| CO2 | M | S | M | M | M |
| CO3 | S | M | S | S | M |
| CO4 | S | M | M | S | S |
| CO5 | M | S | S | M | M |

S- மிகையான (Strong) M- நடுநிலையான (Medium) L- குறைவான (Low)

# MALAYALAM

UNIT – 1

**മാധ്യമഭാഷ**

മാധ്യമം – നിർവ്വചനം – ചരിത്രം – സാങ്കേതികവിദ്യ – വിവിധതരം മാധ്യമങ്ങൾ - സമൂഹം – സംസ്കാരം - സ്വാധീനം

FOR DETAILED STUDY

1. ഡോ. ടി. അനിതകുമാരി – മാധ്യമഭാഷ ഇന്ന്

UNIT – 2

**അച്ചടിമാധ്യമം**

അച്ചടിയുടെ ചരിത്രം – കേരളത്തിലെ ആദ്യകാല പ്രവർത്തനങ്ങൾ - പത്രമാസികകളുടെ ആദ്യകാലം – പുതിയ കാലത്തെ അച്ചടി രീതികൾ - ലിപി പരിഷ്കരണം – ഡിടിപി - തനതു ലിപികൾ

FOR DETAILED STUDY

2. ഡോ. എസ്.എസ്. ശ്രീകുമാർ - മലയാള ലിപി പരിഷ്കരണം വരുത്തിയ വിനകൾ

UNIT – 3

**ദൃശ്യശ്രവ്യമാധ്യമം**

റേഡിയോ – ടെലിവിഷൻ - മള്ട്ടിമീഡിയ - സിനിമ – പൊതു സ്വഭാവം – ഗുണദോഷവശങ്ങൾ

FOR DETAILED STUDY

3. ടെലിവിഷൻ പഠനങ്ങൾ - സി. എസ്. വങ്കേടേശ്വരൻ
ലേഖനം – ജനകീയതയും റിയാലിറ്റിഷോകളും

UNIT – 4

**സൈബർമാധ്യമം**

ഇന്റർനെറ്റ് – ചരിത്രം – മലയാളത്തിലെ ബ്ലോഗുകൾ - സൈബർ സാന്നിദ്ധ്യം – സോഷ്യൽ മീഡിയ – സ്മാർട്ട് ഫോൺ ഉപയോഗം – ഗുണദോഷവശങ്ങൾ

FOR DETAILED STUDY

4. ഡോ. അച്യുത് ശങ്കർ എസ്. നായർ - സൈബർ മലയാളം

UNIT – 5

**പരസ്യകല**

പരസ്യം – നിർവ്വചനം – സംസ്കാരം – സ്വാധീനം– വിവിധതരം പരസ്യങ്ങൾ - ആശയബോധനം

FOR DETAILED STUDY

5. പ്രായോഗികപരിചയം നടുന്നതിനാവശ്യമായ പ്രവർത്തനങ്ങൾ നടത്തുക. പരസ്യം നിർമ്മിക്കുന്നതിനുള്ള വിഷയം നല്കുക.

REFERENCE BOOKS

പത്രലോകം – ഒരു സംഘം ലഖേകർ - കരേള ഭാഷാ ഇന്സ്റ്റിറ്റ്യൂട്ട്
ആ ലോകം മുതല് ഇ-ലോകം വരെ – ഡോ. ജെ. വി. വിളനിലം
മാധ്യമങ്ങളും മലയാളസാഹിത്യവും – കരേള ഭാഷാ ഇന്സ്റ്റിറ്റ്യൂട്ട്
പത്രഭാഷ – കരേള പ്രസ് അക്കാദമി
മലയാളഭാഷയും ആഗോളവത്കരണവും – ഡോ. കെ. എസ്. പ്രകാശ്, ഡോ. എസ്. എ. ഷാനവാസ് (പ്രകാശനവിഭാഗം, കരേള സർവ്വകലാശാല)
ഭാഷയും മാധ്യമവും – വി. കെ. നാരായണന്
മാധ്യമഭാഷാ മാറ്റങ്ങൾ - കെ. കെ. ശ്രീരാജ്
ടലൊവിഷന് പഠനങ്ങൾ - സി. എസ്. വങ്കിടേശ്വരന്
മാധ്യമങ്ങളും മലയാളസാഹിത്യവും – എം. വി. തോമസ്
ഇന്റർനെറ്റും ഇന്ഫർമേഷന് വിപ്ലവവും – കെ. രവീന്ദ്രന്, ഡോ. കെ. ഇക്ബാല്
ഇന്ഫർമേഷന് സയന്സ് – ഒരാമുഖം – ഡോ. ജി. ദേവരാജന്
മലയാള സൈബർ സാഹിത്യം – ഡോ. മനോജ് ജെ. പാലക്കുടി
സൈബർ മലയാളം – സുനീത ടി. വി. (എഡി.)
മാറുന്ന ലോകം മാറുന്ന മാധ്യമലോകം – എന്. പി. രാജന്േദ്രന്
Progress in Information Technology – Dr. G. Devarajan
The Mass Media and You – Desmond D' Abreo
Advertising – Dr. C. N. Santakki

# HINDI

**Objectives:**

1. To acquire knowledge regarding fundamental concepts in Hindi grammar.
2. To acquire the ability to master translation skills
3. To develop writing skills for official documentation – Letter, Banking terminologies

Co**urse Outcomes:**

| C.O. No. | Upon the completion of this course, students will be able to | PSOs Addressed | Cognitive Level |
|---|---|---|---|
| CO 1 | Understand the writing skills of novelist - Premchand | F,G | K1,K4 |
| CO 2 | Understand the basics of navras, vrith and alankars | B,D | K1,K2 |
| CO 3 | Understand the history of Hini Literature – modern and medieval | A,C | K3,K5 |
| CO 4 | Apply and analyse administrative Hindi | A,C | K5 |
| CO 5 | Writing skills - Essay | B,C,D | K4,K5 |

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create

**UNIT I**

NOVEL

1. Nirmala

**UNIT II**

POETICS

KavyaPradeep

1. Ras - Navras
2. Chand – Rola, Doha, Soratta
3. Alankar – Anupras, Upama, Roopak

**UNIT III**

HISTORY OF HINDI LITERATURE

1. Reethikal – Visheshatha, Pramukh Kavi – Bihari Lal

2. Adhunik Kaal – Chaya Vaad – Pramukh Kavi
3. Gadya Sahithya – Bharadendu, Prem Chand

**UNIT IV**

ADMINISTRATIVE HINDI

**UNIT V**

ESSAY WRITING

(General Topics – Paryavaran Aur Pradooshan, Bhoomandalikaran Aur Hindi, Varthaman Yug Aur Technique, Nari Ki Desha Aur Disha, Desh Vikas Mein Yuva Peedi Ka Yogdaan)

**Text book:**

1. Nirmala – Premchand – Published by Gyan Bharathi Prakashan, Dariabad, Allahabad
2. Kavya Pradeep – Ram Bhaori Shukla – Published by Lok Bharathi Prakshan, Pehli Manzil, Darbari Building, Mahatma Gandhi Maarg, Allahabad
3. Hindi Sahithy ka Saral Ithihas – Viswanath Tripathi – Published by Orient Publication Private Limited, Himayath Nagar, Hyderabad

**Books for Reference:**

1. Hindi Vathayan – Dr. K M Chandra Mohan – Published by Viswavidyalay Prakashan, Varanasi
2. Essay Writing – General Topics

**Mapping with POs**

| Cos | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 |
|---|---|---|---|---|---|---|---|---|
| CO 1 | S | S | S | S | S | S | S | M |
| CO 2 | S | S | M | S | M | S | S | S |
| CO 3 | S | S | S | S | S | S | M | S |
| CO 4 | S | S | S | S | S | S | S | S |
| CO 5 | S | S | M | S | S | S | L | S |
| CO 6 | S | S | S | S | M | M | S | S |

S – Strong, M – Medium, L – Low

# ENGLISH

**PROGRAMME OUTCOMES – PO**

At the end of the course students will be able to

**PO1**: Imbibe moral, ethical, and cultural values through various forms of literature.

**PO 2**: Enable the learner to communicate effectively and appropriately in real life situation.

**PO3**: Able to think, speak, and write independently using grammatical forms and Vocabulary.

**PO4**: Improve their writing and reading fluency skills through extensive reading.

**PO5:** Develop their pronounciation by studying the sounds of language.

**PROGRAMME SPECIFIC OUTCOME: PSO**

At the end of the course students will be able to:

**PSO1**: Provide the students with an ability to build and enrich their communication skills.

**PSO2**: Critically analyse and appreciate poetry, prose, fiction and play.

**PSO3**: Enhance sufficient practice in Vocabulary, Grammar, Comprehension.

**PSO4**: Study the Phonetic symbols for correct pronounciation.

**PSO5**: Spot language errors and correct them.

## GENERAL ENGLISH -- PROSE, POETRY, DRAMA, GRAMMAR, LANGUAGE STUDY& ORAL COMMUNICATION SKILLS

**UNIT I - PROSE**

1. Give us a Role Model – A.P.J.Abdul Kalam.
2. The Best Investment I have ever made – A.J. Cronin
3. Seven Good Habits – Robin Sharma
4. How much Land does a Man Need - Leo Tolstoy

**UNIT II – POETRY**

1. 1.Anxiety – A.K.Ramanujam
2. Incident on the French Camp – Robert Browning.
3. Stopping by the woods – Robert Frost
4. Still I raise – Maya Angelo

**UNIT III - DRAMA - Select scenes from William Shakespeare**

1. Antony and Cleopatra – Death Scene of Cleopatra – Act V, Scene II
2. Macbeth – Sleep Walking Scene – Act V, Scene I
3. King Lear – Heath, before a Hovel – Act lll, Scene IV.

**UNIT IV – GRAMMAR**

1. Transformation of Sentences
2. Synthesis of Sentences
3. Spot the Error

**UNIT V – LANGUAGE STUDY AND ORAL COMMUNICATION**

1. Phonetics – Vowel sounds
2. Dialogue Writing
3. One word Substitution
4. Report writing.

**COURSE OUTCOMES**: At the end of the course students will be able to

| | Course Outcomes | Cognitive level |
|---|---|---|
| CO1 | Use English accurately across the curriculum | K1, K2, K3 |
| CO2 | Attained enhanced vocabulary and improved language skills | K2, K3, K4 |
| CO3 | Analyse and interpret prescribed text | K2, K4 |
| CO4 | Conceptualize the Shakeapearean drama in the prescribed text | K2, K4 |
| CO5 | Gain proficiency in LSRW skills | K1, K2, K3, K4, K6 |

K1- Remember, K2- Understand, K3- Apply ,K4- Analyse , K5- Evaluate,K6- Create

**MAPPING OF COURSE OUTCOMES WITH PROGRAMME OUTCOMES**

| CO/ PO | PO1 | PO2 | PO3 | PO4 | PO5 | POS1 | POS2 | POS3 | POS4 | POS5 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | M | S | S | S | S | M | S | M | S |
| CO2 | M | S | M | M | M | M | M | M | S | M |
| CO3 | M | S | M | S | M | S | M | S | M | S |
| CO4 | S | M | S | M | M | S | S | M | S | M |
| CO5 | M | M | M | S | M | S | S | M | S | M |

S – Strongly correlated, M – Moderately Correlated, w- weakly correlated, No Correlation - 0

**E- LINKS**

1. https:// www.msuniversity.ac.in
2. https://www.bdu.ac.in
3. https//www.scribd.com
4. https://www.goodreads.com
5. https://casenglishdepartment.wordpress.com
6. https://www.poetryfoundation.org
7. https://www.britannica.com
8. https://englishgrammar.org

# PYTHON PROGRAMMING

**Course Objectives**:

The main objectives of this course are to:

- To introduce the fundamentals of Python Programming.
- To teach about the concept of Functions in Python.
- To impart the knowledge of Lists, Tuples, Files and Directories.
- To learn about dictionaries in python.
- To explore the object-oriented programming concepts, Graphical programming aspects of Python with help of built-in modules.

**Course Outcomes:**

- Remembering the concept of operators, data types, looping statements in Python programming.
- Understanding the concepts of Input / Output operations in file.
- Applying the concept of functions and exception handling
- Analyzing the structures of list, tuples and maintaining dictionaries

**UNIT I**

**Introduction to Python**: Features of Python – Execution of a Python program – Flavors of Python – Python Virtual machine (PVM) – Memory Management in Python – Garbage Collection – Comparison of Python with C and Java.

**Datatypes in Python**: Built in Data types: None Type - Numeric types: int, float, complex - datatype conversion - booldatatype.

**Sequences** : string , bytes , bytearray , list , tuple , range - set datatype – mapping datatype - literals. Operators: Arithmetic operators – Assignment operators – Unary minus operator – Relational operators – Logical operators – Boolean operators – Bitwise operators - Membership operators – Identity operators - Operator precedence - Mathematical functions.

**UNIT II**

**Input and Output:** print() - input() - command line arguments.

**Conditionals and Loops**: if statement - if…else statement - if…elif statement - while loop - for loop - the else suite - break statement - continue statement - pass statement - assert statement - return statement.

**Arrays in Python**: Creating array – Importing the array module – Indexing and slicing on arrays – Types of arrays – Working with arrays using numpy – Mathematical operations on arrays – Working with multidimensional array – Matrices in numpy.

**UNIT III**

**Strings and characters**: Slicing the strings – String functions and methods – working with characters. Functions: Defining a function – Calling a function – Pass by object reference – Recursive functions – lambda functions – Function decorators – Generators.

**Lists**: list operations – list slices – aliasing and cloning list - Methods to process lists – Nested list – list comprehension. Tuples: Creating tuples - Basic operations on tuples – Functions to process tuples

**UNIT IV**

**Dictionaries:** Operations on dictionary – Dictionary methods – Using loops with dictionaries – Converting lists, strings into dictionary – Passing dictionary to functions – Ordered dictionaries.

**Exceptions**: Errors in Python program- Exception - Types of exceptions - except Block - assert statement - user defined exceptions - logging the exception.

**Files:** text files - binary files - opening a file - closing a file - working with text file - working with binary files - pickle in Python - seek() and tell() methods - random accessing of binary files - zipping and unzipping files - working with directories.

**UNIT V**

**Classes and objects:** Creating a class - the self variable - constructor – instance variables - class variables - namespaces - Instance methods - class methods - static methods - passing members of one class to another class - inner class.

**Inheritance:** Constructors in inheritance - overriding super class constructors and methods - super() method - types of inheritance - Method Resolution Order (MRO).

**Polymorphism:** Duck Typing Philosophy of Python - Operator overloading - Method overloading - Method overriding.

**Mapping of COs to POs and PSOs**

| Course Outcome | PO Addressed PO1 to PO7 | Correlation Level L/M/H | PSO Addressed PSO1 to PSO7 | Correlation Level L/ M/ H | Cognitive Level K1 to K6 |
|---|---|---|---|---|---|
| CO1 | PO1 | M | PS01, PSO5 | M/M | K1 |
| CO2 | PO2, PO3 | H/M | PS02, PSO3 | H/M | K2 |
| CO3 | PO4 | H | PSO4,PS06 | H/M | K5 |
| CO4 | PO5,PO6 | M/H | PSO5 | M | K6 |

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

**Text Book**

R. NageswaraRao, ―Core Python Programming‖, Second Edition, Dreamtech Press, 2019.

**Reference Books**

1. Allen B. Downey, ―Think Python: How to Think Like a Computer Scientist‖, 2nd edition, O'REILLY, 2012.
2. Wesley J Chun, ―Core Python Applications Programming‖, Prentice Hall, 2012.
3. Martin C. Brown, ―PYTHON: The Complete Reference‖, McGraw-Hill, 2001.
4. E. Balagurusamy, ―Problem Solving and Python Programming‖, McGraw-Hill, First Edition, 2017.

# SOFTWARE ENGINEERING

**COURSE OBJECTIVES:**

- To understand the nature of software & software engineering.
- To introduce principles of software development
- To learn about planning, developing, designing testing and validating a project.

**COURSE OUTCOMES:**

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to identify, formulates, and solves engineering problems.

**UNIT – 1 SOFTWARE AND SOFTWARE ENGINEERING**

The Nature of Software – What is Software Engineering? - Software engineering as a branch of the engineering profession – Stack holders in Software engineering - Software quality - Software engineering projects – Activities common to Software projects – Difficult and risk in software engineering as a whole. Review of Object Orientation: What is object orientation - Classes and objects – Instance variables – Methods, Operations and Polymorphism – Concepts best define object orientation – Difficulties and risks in programming language choice and object – oriented programming.

**UNIT – 2 DEVELOPING REQUIREMENTS Domain analysis**

The starting point for software projects – Defining the problem and the scope – What is a requirement? – Types of requirements – Some techniques for gathering and analyzing requirements – Managing changing requirements – Difficulties and risks in domain and requirements analysis.

**UNIT – 3 MODELING WITH CLASSES**

What is UML? – Essentials of UML class diagrams – Associations and Multiplicity – Generalization – Instance diagrams – More advanced features of class diagrams. Modeling Interactions and Behavior: Interaction diagram – State diagrams – Activity diagrams.

**UNIT - 4 ARCHITECTING AND DESIGNING SOFTWARE**

The process of design – Principles leading to good design – Techniques for making good design decisions – Software architecture – Architectural patterns – Writing a good designing document.

**UNIT – 5 TESTING AND INSPECTING TO ENSURE HIGH QUALITY**

Basic definitions – Effective and efficient testing – Defects in ordinary Algorithms – Defects in numerical algorithms – Defects in timing and co-ordination. Managing the Software Process: What is project management? – Software process models – Cost estimation – building software engineering teams – Project scheduling and tracking.

**Mapping of COs to POs and PSOs**

| Course Outcome | PO Addressed PO1 to PO7 | Correlation Level L/M/H | PSO Addressed PSO1 to PSO7 | Correlation Level L/ M/ H | Cognitive Level K1 to K6 |
|---|---|---|---|---|---|
| CO1 | PO1 | M | PS04 | M | K2 |
| CO2 | PO2, PO4 | M/H | PS01,PS05 | M/H | K4 |
| CO3 | PO3,PO5 | H/H | PS02 | M | K3 |
| CO4 | PO6 | H | PS03, PS06 | H/M | K5 |

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

**TEXT BOOK:**

Object Oriented Software Engineering - Timothy C.Lethbridge and Robert Laganiere,2nd Edition, McGraw Hill Education, 2005.

**REFERENCE BOOKS**:

1. Object Oriented and classical Software Engineering - Stephen, R. Schach, 5th Edition, McGraw-Hill Education, 2011.

2. Fundamentals of Software Engineering - Carlo Ghezzi, MedhiJazayeri, Dino Mandrioli, 2nd Edition, Pearson, 2015.

# RESOURCE MANAGEMENT TECHNIQUES

**COURSE OBJECTIVES**

- To solve optimization problems using simplex method.
- To learn to solve problems in linear programming and Integer programming.
- To use PERT and CPM for problems in project management.

**COURSE OUTCOMES:**

- Make use of simplex method to solve optimization problems.
- To find solution for various shortest route problems.
- Utilize PERT and CPM in project management.

**UNIT – 1 LINEAR PROGRAMMING**

Introduction – Advantages and disadvantages of LP – Basic characteristics of LP – General linear Programming problem – Algebraic solution of a LP (Simplex Method).

**UNIT - 2 ASSIGNMENT PROBLEM**

Introduction – Definition and Mathematical formulation – Methods of solutions – Application area of AP – Comparison between AP and TP – Basic theorems – Hungarian method – Exceptional cases of AP – AP with restrictions – Multiple optimal solution of an AP.

**UNIT – 3 JOB SEQUENCING & NETWORK MODEL PROBLEMS**

Introduction, Basic terms and Notations used in Sequencing – Priority sequencing rules – Gantt Chart – Types of Job sequencing problems. Network models: Introduction – Basic features of Network models – Main advantages of Network models – Network models – Minimum spanning tree algorithm – Shortest route problem – Maximum flow and minimum cost flow problems – Travelling salesman problem as a network model – Unifying model: Minimum cost flow network – Linear programming approach to a network model.

**UNIT – 4 PROJECT MANAGEMENT**

Introduction – Basic concepts – Project planning techniques – CPM & PERT techniques – Critical path method –The PERT approach – Expected length of a project - Probability of project completion by due date – cost consideration in project scheduling – similarities and differences in CPM & PERT.

**UNIT – 5 GAME THEORY**

Introduction – Definitions and Terminology – Basic game theory models – Fundamental Principles of game theory – Assumptions underlying game theory – Pure strategies: Games with saddle point – The rules of Dominance – mixed strategies: Games without saddle point – Solution of 2xn and mx2 Games(graphical approach) – Linear programming solutions of Games. Inventory control: Fundamentals of Inventory theory – Basic terminology – Advantages &disadvantages of Inventory – formula for the quantity to order and lead time – EOQ with price-breaks.

**Mapping of COs to POs and PSOs**

| Course Outcome | PO Addressed PO1 to PO7 | Correlation Level L/M/H | PSO Addressed PSO1 to PSO7 | Correlation Level L/ M/ H | Cognitive Level K1 to K6 |
|---|---|---|---|---|---|
| CO1 | PO1 | H | PS05 | H | K1 |
| CO2 | PO2, PO6 | M/H | PS03, PS02 | M/M | K5 |
| CO3 | PO4 | H | PS06 | H | K6 |

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

**TEXT BOOK**: Operations Research Models & Methods – Chandrasekhar Salimath, Bhupenderparashar – Universities press 2014.

**REFERENCE BOOKS:**

1. Operations Research – Nita H.Shah , Ravi M. Gor, HardikSoni – PHI Learning Private Limited, New Delhi, 2009.
2. Operations Research – P.K.Gupta, Dshira, Schand, 2015.
3. Operations Research – H. A Taha, 9th Edition, Pearson, 2014

# PYTHON PROGRAMMING LAB

**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.
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.

# ACCOUNTING SOFTWARE – TALLY

**Course Objectives:**

- This course is designed to impart knowledge regarding concepts of Financial Accounting Tally is an accounting package which is used for learning to maintain accounts.
- As this course is useful for Commerce and computer students to get placements in different offices as well as companies in Accounts departments.

**COURSE OUTCOMES:**

- Company Setup &Configurations.
- Charts of Accounts Setup.
- Recording Financial Transactions.
- Financial Reports Analysis.

**Unit –I Introduction to Tally**

Features of Tally – Enhancement in Tally – Opening Tally – Components of the Tally – Creating a company.

**Stock and Godwon in Tally**: Stock Groups- Stock Categories – Stock Items – Units of Measures – Godwons.

**Unit – II Groups, Ledgers, Vouchers and Orders**

Introducing Groups –Introducing Ledgers –Introducing Vouchers- Introducing Purchase Orders –Introducing a Sales order – Introducing Invoices.

**Unit- III Reports in Tally**

Working with Balance sheet – Working with Profit & Loss A/c report – Working with stock summary report – Understanding ratio analysis – working with Trial Balance Report – Working with Day Book report.

**Unit –IV Payroll**

Exploring payroll in Tally – Working with Payroll vouchers – Defining Payroll reports – working with statements of Payroll report – Describing salary disbursement.

**Unit –V Taxation**

Indian Tax structure – Tax Deducted at Source in Tally – Creating a Tax Ledger – TDS Vouchers – Tax Collected at Source in Tally – TCS Reports in Tally – VAT Classification – VAT vouchers – VAT reports – Service Tax – GST – CGST – SGST – IGST.

**Mapping of COs to POs and PSOs**

| Course Outcome | PO Addressed PO1 to PO7 | Correlation Level L/M/H | PSO Addressed PSO1 to PSO7 | Correlation Level L/ M/ H | Cognitive Level K1 to K6 |
|---|---|---|---|---|---|
| CO1 | PO4 | M | PS01,PS05 | M/H | K5 |
| CO2 | PO2 | H | PS03,PSO4 | M/H | K4 |
| CO3 | PO1,PO5 | M/H | PS02 | M | K6 |
| CO4 | PO3,PO6 | H/H | PS03, PS06 | H/M | K3 |

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

**Text Book:**

Tally.ERP 9 in Simple Steps - DT Editorial Services, DreamTech Press.

**Reference Books**:

S. Palanivel – Tally Accounting Software – Margham Publications

# ACCOUNTING SOFTWARE – TALLY Lab

## PRACTICAL LIST

1(a).Develop a purchase day book as your own data
(b).Create a sales daybook as your imaginary figures
(c).Give a format of a petty cash book with your own figure
(d). Prepare an invoice book with your own figure

2. With the following particulars, prepare a trail balance:

| | | |
|---|---|---|
| 1 | Capital | 50,000 |
| 2 | Sales | 5,50,000 |
| 3 | Purchases | 5,60,000 |
| 4 | Salaries | 2,200 |
| 5 | Carriage inwards | 400 |
| 6 | Lightings | 300 |
| 7 | Rates & insurance | 400 |
| 8 | Discount earned | 500 |
| 9 | Buildings | 30,850 |
| 10 | Furnitures | 6,000 |
| 11 | Carriage Outwards | 500 |
| 12 | Sundry Debtors | 8,000 |
| 13 | Sundry Creditors | 20,000 |
| 14 | Cash at Bank | 12,850 |

3.Prepare a proper Subsidiary book and do the transactions with your own data
4.Prepare a Petty Cash bool with your own data
5.Prepare a Balance Sheet of a Software company with your own data
6.Prepare Sales invoice of a medical store with your own data

# MICRO PROCESSOR

**COURSE OBJECTIVES:**

- To study about microprocessor Architecture.
- To learn about basic 8085 microprocessor and its operations and applications.
- To do arithmetic manipulations using 8085 processor.

**COURSE OUTCOMES**:

- To write programs to run on 8086 microprocessor-based systems.
- Design system using memory chips and peripheral chips for 16-bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.

**UNIT – 1 MICROPROCESSORS, MICROCOMPUTER AND ASSEMBLY LANGUAGE**

Microprocessors – Microprocessors Instruction set and Computer Languages – Computers to single chip microcontrollers. Mention to 8085 assembly language Programming – The 8085 Programming model action Classification – Instruction, data format and storage – How to write, store and execute simple program, Overview of 8085 instruction set.

**UNIT – 2 MICROPROCESSOR ARCHITECTURE AND MICRO COMPUTER SYSTEMS** Microprocessor Architecture and its operations – Memory – Input and Output (I/O) – Example of a Micro Computer System. Microprocessor Architecture and Memory interfacing: The 8085 MPU – Example 8085 based microcomputer - Memory interfacing - Interfacing the 8155 memory.

**UNIT – 3 DATA TRANSFER OPERATION** Arithmetic operations – Logic operations – Branch operations - Writing assembling Language programs – Debugging a program.Programming techniques with additional Instruction: Programming techniques – Counting and Indexing – Additional data transfer and 16-bit arithmetic operations – Arithmetic operations related to memory - Logic operations related to memory - Logic operations – Rotate – Dynamic debugging.

**UNIT - 4 COUNTERS AND TIME DELAYS** Counters Time Delays – Hexa decimal counter. Modulo ten counter – Pulse Wave forms – Debugging counter and time Delay programs. Subroutine: Stack – Subroutine – Restart – Conditional call and Return subroutine concepts.

**UNIT-5 CONVERSIONS**

BCD to Binary conversion – Binary to BCD conversion - BCD to seven segment.LED code conversion – BCD addition – BCD Subtraction – Multiplication- Subtraction with carry.

**Mapping of COs to POs and PSOs**

| Course Outcome | PO Addressed PO1 to PO7 | Correlation Level L/M/H | PSO Addressed PSO1 to PSO7 | Correlation Level L/ M/ H | Cognitive Level K1 to K6 |
|---|---|---|---|---|---|
| CO1 | PO3 | M | PS01,PS03 | M | K2 |
| CO2 | PO1, PO4 | M/M | PS05 | M/H | K3 |
| CO3 | PO5 | H | PS06 | H | K5 |

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

**TEXT BOOKS:**

1. Ramesh S. Goanker - Microprocessor Architecture Programming and Applications with the 8085 – 5th Edition, Penram International Publisher 2000.
2. Microprocessor and Microcontrollers N. Senthil Kumar, M. Saravanan, S. Jeevananthan. Oxford University Press, 2016

**REFERENCE BOOK:**

1.8085 Microprocessor Programming and Interfacing - N.K.Srinath, PHI Publication,

# FUNDAMENTALS OF STATISTICS-II

**Objective:**

- To know the concept of attributes and to study the index numbers and simple problems.

**Course Content:**

**UNIT–I**

Theory of attributes–two attributes.

**UNIT –II**

Index number –weighted index number.

**UNIT – III**

Consumer Price index number –conversion of index number.

**UNIT –IV**

Time series –measurement of trends.

**UNIT–V**

Curve fitting–Straight line –Parabola –Exponential curve.

**Text Book:**

1. Dr. S. Arumugam, A.ThangapandiIssac- Statistics, New Gamma Publishing House,Palayamkottai (2016).

**Books for Reference:**

1. S.P.Gupta-Elementary Statistical Methods,Sultan Chand & Sons,2017).
2. T. Veerarajan Fundamentals of mathematical Statistics, YesDee Publishing Pvt.Ltd.Edition .(2017)

**Course Outcomes:**

On successful completion of the course, the students should be able to

| CO No. | Course Outcome | Knowledge Level |
|---|---|---|
| CO1 | Explain the theory of Attributes | K3 |
| CO2 | Illustrate about index numbers and to determine the weighted index numbers. | K1,K5 |
| CO3 | Analyse and predict consumer price index numbers | K6 |
| CO4 | Evaluate Time series | K4 |
| CO5 | Apply curve fitting for straight line ,parabola and exponential curve | K2 |

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

**CO-PSO mapping (Course Articulation Method)**

| PSOs / Cos | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 2 | 3 | 3 | 3 | 3 |
| CO2 | 2 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 3 |
| CO5 | 2 | 3 | 1 | 3 | 3 |
| Total contribution of COs to PSOs | 12 | 13 | 11 | 13 | 14 |
| Weighted Percentage of COs contribution to PSOs | 80 | 86.67 | 73.33 | 86.67 | 93.33 |

# அறிமுகத்தமிழ்

**அலகு- 1 : செய்யுள் பகுதி**

1. கடவுள் வாழ்த்து
2. கல்வி:
3. அறம்
4. ஆத்திசூடி
5. ஓடி விளையாடு பாப்பா
6. பசுவும் கன்றும் பாடல்

**குறிப்பு:- மனப்பாடப்பகுதி**

1. கடவுள் வாழ்த்து
2. கல்வி
3. அறம்
4. ஆத்திச்சூடி

**அலகு-2:** கதை வாசித்து கதை சொல்லல்

1. பணிமிருந்தும் பட்டினி
2. அறிவால் வெல்லுவேன்

**அலகு-3 : பொதுக்கட்டுரை**

1. ஒன்றுபட்டால் உண்டு வாழ்வு
2. வாய்மையே வெல்லும்

**அலகு -4 : சொற்பொருள் அறிதல்**

**அலகு- 5: மொழித்திறன் பயிற்சி**

# COMPUTERS FOR DIGITAL ERA

**Objectives:**

1. To create the awareness about the digital India among the student community.
2. To make the student to understand the role of computer in the day to day living.
3. To create the awareness about the e-learning and security issues.

**Unit I**

**FUNDAMENTALS OF COMPUTERS**

The role of computers in the modern society – Types of Computers and their specifications – Server – Desk Top Computers - Lap Top – Tablet – Smart Phones - Block diagram of Digital Computer –Working Principle of Computer, I/O Devices – Central Processing Unit – Types of Memory - Display – Port – UPS – Setting up and Maintenance of Computer.

**Unit II**

**TYPES OF SOFTWARE AND OFFICE AUTOMATION**

Types of Software with examples – System Software – Application Software – Utility Software - Operating System – Basics on Windows – Introduction to Android –Application Software - Free Open source software – Database and its applications – Office Automation Software – applications of Microsoft Word – Microsoft Power Point – Microsoft Excel.

**Unit III**

**INTERNET AND MOBILE APPLICATIONS**

Introduction to computer networks – LAN – WAN – MAN – Wired and wireless network – Wi Fi Networks - Network Devices – Modem – Switch – Router – Broad Band – Leased Lines- Internet – WWW – URL- Browser – e-mail – SMS – MMS - Client Server Computing - Cloud – Public and Private cloud – Mobile Applications.

**Unit IV**

**E – GOVERNANCE IN INDIA**

E-Governance initiative by the Government – Digital India Platform – Agencies enabling Digital India - Electronic Payment and Receipt – Digital Locker – e-district service – electronic signature service – Digital AIIMS – India BPO Scheme – Integrated Nutrient Managment – GIS – Mobile Seva App Store- GARV- Grameen Vidyutikaran

**Unit V**

**E – LEARNING AND MOOC**

E – Learning – Digital Library – E- Journals – Introduction to MOOC – Edex – Course era etc - SWAYAM – NPTEL – Cyber Security – Virus – Malware – Network Security - Hacking – Big Data – Data Analytics – Social Networks – Social Media Analytics- Introduction to IT Act.

- **10 Hours Practical Sessions are to be allotted for Computer & Mobile Applications**

**Suggested List of Exercises:**

1. Setting up of computers – Connecting I/O device, UPS, CPU, Printers, Mouse, Key Boards, Pen Drives, etc. (Mandatory)
2. Minor fault findings.
3. Preparing a word Document and saving, copying files, deleting files, renaming files, etc. (Mandatory)
4. Preparing slides – Animation – Slide Transition – Back Ground Changing – Word Art , etc. (Mandatory)
5. Preparing Mark Sheet with Excel - Calculating First Class, second class, etc. (Mandatory)
6. Browsing – Searching for documents – e-mail id creation - Useful mobile apps – downloading. (Mandatory)
7. Data/Wi-Fi Connectivity and Exchanging of Data.
8. Electronic Payment – Online Application Processing
9. Browsing for NPTEL/ SWAYAM Courses
10. Browsing the useful e-learning sites

**Learning Outcomes:**

At the end of the course the students will be able to:

1. apply the computing technology in their day to day life
2. create awareness regarding digital India initiatives to their surroundings
3. identify the areas where he can extend the digital computing for their benefits.

**Text Book:**

1. E- Materials of Manonmaniam Sundaranar University on “Computer for Digital Era”, http://msuniv.ac.in

**References:**


1. Andrew S. Tanenbaum, Computer Networks, 4th Edition, Eastern Economy Edition, PHI Private Ltd, New Delhi, 2003.
2. Gautam Shroff, Enterprise Cloud Computing, Technology, Architecture, Applications, Cambridge University Press, First Edition, 2010.
3. Reza B'Far, Mobile Computing Principles, Cambridge University Press, First Edition, 2005.
4. Charles P Pfleeger, Shari Lawrence Pfleeger, Security in Computing, I Edition, Pearson Education, 2003.
5. https://swayam.gov.in
6. http://www.digitalindia.gov.in/content/social-media-analytics


| Scheme of Examination | |
|---|---|
| Internal – 25 Marks | External – 75 Marks |
| Internal Break Up - 15 for Continuous Assessment Test (CAT) + 5 for Assignment + 5 for Seminar. 3 CATs ( Two tests on Theory and one on Practical )are to be conducted | |