

**Uka Tarsadia University**



**B.C.A.**

**Fundamentals of Programming (030010101)**

**1<sup>st</sup> Semester**

**EFFECTIVE FROM JUNE-2014**

UKA TARSADIA UNIVERSITY  
BCA 1<sup>st</sup>Semester Syllabus, 2014-2015

Course Code: 030010101

Course Title: Fundamentals of Programming

Course Credits: 4

Total Hours: 48

[Lectures: 04, Tutorial: 00, Practical: 04]

Prerequisites: Nil

Prerequisites By Topics: Nil

Objectives: To introduce the fundamentals of programming concepts, methodology and enforce logical thinking, to design and develop algorithm along with familiarity with problem solving techniques.

- 1 Introduction of Computers, Logic and Structure [07 Hours]
  - 1.1. Programming Paradigm
  - 1.2. Programming Process: Problem Understanding, Planning, Coding, Translation, and Testing
  - 1.3. Data Hierarchy, Flowchart Symbols, Pseudo Code Statements and Connector
  - 1.4. Variables, Data Types and Evolution of Programming Techniques
  - 1.5. Unstructured Spaghetti Code and Recognizing Structure
  - 1.6. Storage Classes and Basic Structures
- 2 The Program Planning Process and Making Decisions [08 Hours]
  - 2.1. Documentation, Advantages of Modularization and Program Modularization
  - 2.2. Local and Global Variables and Constants
  - 2.3. Mainline Logic and Procedural Programs
  - 2.4. Hierarchy Chart and Features of Program Design
  - 2.5. Boolean Expressions, Relational Operators, Logical Operators, Precedence
  - 2.6. Case Structure and Decision Tables
- 3 Looping and Control Breaks [09 Hours]
  - 3.1. Control and Nested Loops
  - 3.2. Common Mistakes and Advantages of Looping
  - 3.3. For, Do While and Do Until Loops
  - 3.4. Single-Level Break and Multiple-Level Control Break
- 4 Arrays [07 Hours]
  - 4.1. Array Declaration and Memory allocation
  - 4.2. Array Initialization
  - 4.3. Constant Arrays and Parallel Arrays
  - 4.4. Searching from Array
  - 4.5. String processing
- 5 Methods [07 Hours]
  - 5.1. Method Creation with single parameter
  - 5.2. Method Calling
  - 5.3. Method Creation with Multiple Parameters
  - 5.4. Passing Arrays into Methods
- 6 Derived Types and File Handling [10 Hours]
  - 6.1. Overview of Pointers
  - 6.2. Structure declaration and Structure of Array
  - 6.3. Enumerated and Union Types
  - 6.4. Sequential and Binary Files : Creation, Merging and Updating
  - 6.5. Command Line Arguments
  - 6.6. Preprocessor Directives

**Course Outcomes:**

- C01: Understand the basic concepts of programming.
- C02: Solve technical problems through program development life cycle.
- C03: Design and develop programs using conditional control statements.
- C04: Design and develop programs using looping and control statements.
- C05: Declare, initialize and perform basic operations on single dimensional array.
- C06: Design and develop programs using multi dimensional arrays and string manipulations.

- C07: Design and develop methods with declaration and calling.
- C08: Develop programs to perform file operations namely read, write, and append.
- C09: Design and develop derived data type and use it in problem solution

### Course Objectives and Course Outcomes Mapping:

Understand the fundamentals of programming concepts and methodology: C01, C02, C03, C04, C05, C06, C07, C08, C09

To develop algorithm, enforces logical thinking: C01, C02, C03

To become familiar with problem solving techniques: C03, C04, C05, C06, C07, C08, C09

### Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcome								
		C01	C02	C03	C04	C05	C06	C07	C08	C09
1	Introduction of Computers, Logic and Structure	✓	✓							
2	The Program Planning Process and Making Decisions	✓	✓	✓						
3	Looping and Control Breaks		✓	✓	✓					
4	Arrays		✓	✓	✓	✓	✓			
5	Methods		✓	✓	✓	✓	✓	✓		
6	Derived Types and File Handling		✓	✓	✓	✓	✓	✓	✓	✓

### Hands-on Experience Activity:

- ❖ Students shall be practicing programming concepts in C programming language using gcc compiler on their personal laptops.

### Laboratory:

- ❖ The practical list shall not be repeated for next two consecutive years.
- ❖ Laboratory supervisor or course teacher shall sign in the journal only if he/ she feel satisfied by the work of student.
- ❖ Journal shall be verified twice during the 5<sup>th</sup> and 10<sup>th</sup> week of semester by course teacher.
- ❖ Journal must not be certified if required number of problems are not included and not written clearly or copied.
- ❖ After the approval of the Programme Coordinator, the List of problem definition shall be kept by concern teacher on web site before the commencement of the semester.
- ❖ Journal includes algorithm or spaghetti code, flowchart, program source code, sample calculation and program output for each problem.
- ❖ Problem list shall contain practical problems from 6 units are as follow:

Unit No.	Minimum No. of problem	Required No. of problem to get journal certified	Remarks
1	5	5	Covering topics: 1.3 to 1.7
2	5	5	Covering all sub-topics from unit.
3	10	8	Covering all sub-topics from unit.
4	8	7	Covering all sub-topics from unit.
5	10	9	Covering all sub- topics from unit.
6	7	6	Covering all sub- topics from unit.

### Computing Environment:

A student must have the following computing environment in laboratory and or on his/her laptop and.

- ❖ GNU gcc compiler in Linux platform.

### Modes of Transaction (Delivery):

- ❖ Lecture method : shall be used but along with it, as and when required, discussion method would be

- ❖ fruitful. It shall be supplemented with various appropriate audio-visual aids.
- ❖ Activity assignment : shall be given to the student. Assignment questions should be logical and twisted.

### Activities/Practicum:

The following activities shall be carried out by the students.

- ❖ Historical study of the Programming languages.
- ❖ Study of the programming paradigm.
- ❖ Study of standard header files.
- ❖ Programs for core elements of the subject.

The following activities shall be carried out by the teacher.

- ❖ Discussion of programming standards and coding style with data validation.
- ❖ Demonstrate programming Environment and Program Testing and debugging.
- ❖ Recent trend in programming.
- ❖ Discussion of Compilation, Linking and Loading and Program execution process.

### Text Book:

1. Farrell Joyce - Programming Logic and Design - Course Technology.
2. Behrouz Forouzan, Richard Giberg - Computer Science-A Structure Approach Using C - Cengage Learning

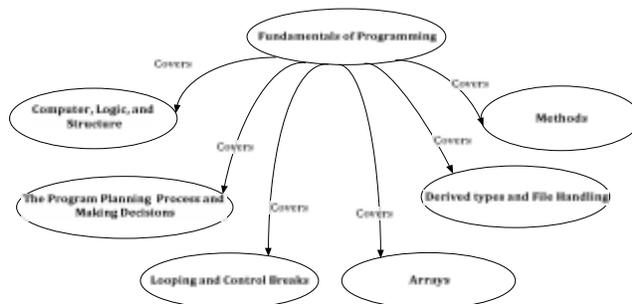
### Reference Books:

1. Pradip Dey, Manas Ghosh- Programming in C - Oxford Higher Education
2. Y. Kantikar – Let us C – BPB Publication
3. Juneja, Anita Seth- Programming in C - Cengage Learning
4. Amiya Rath, Alok Jagadev, Santosh Swain- Programming in C - SCITECH
5. B. Gottfried – Schaum’s outline of Programming with C - Shaum Series

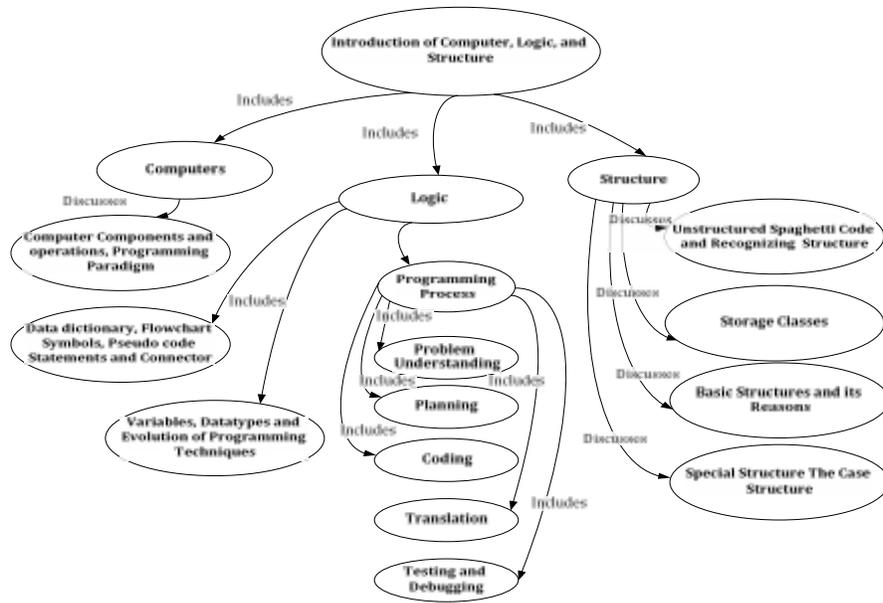
### Concept Map:

It is a hierarchical / tree based representation of all topics covered under the course. This gives direct / indirect relationship /association among topics as well as subtopics.

#### Fundamentals of Programming



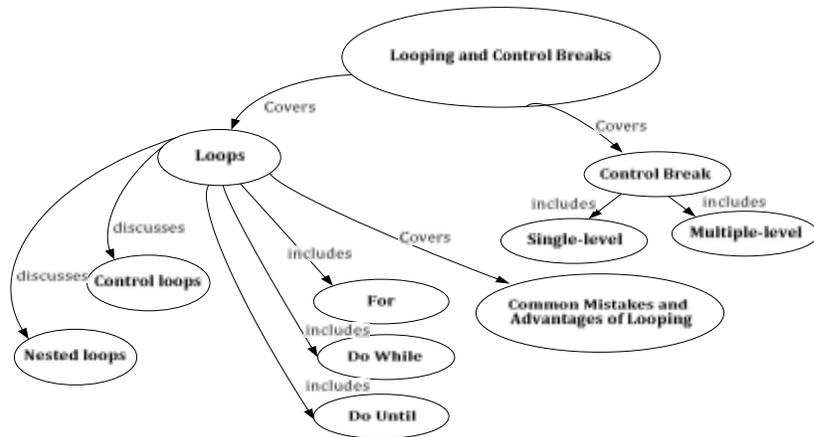
#### Unit-1: Introduction of Computer, Logic, and Structure



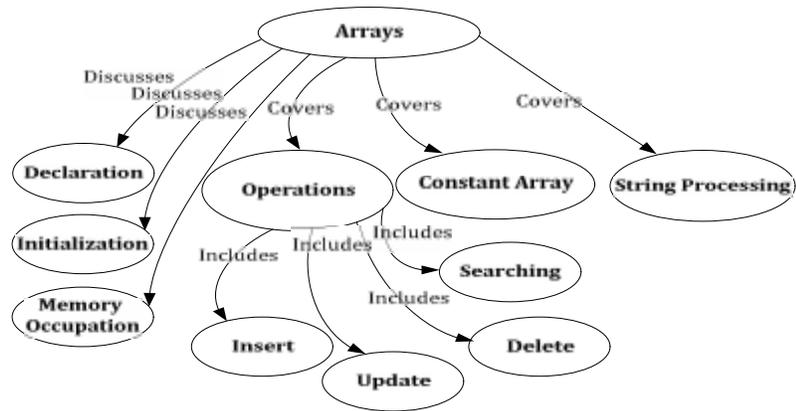
Unit-2: The Program Planning Process and Making Decisions



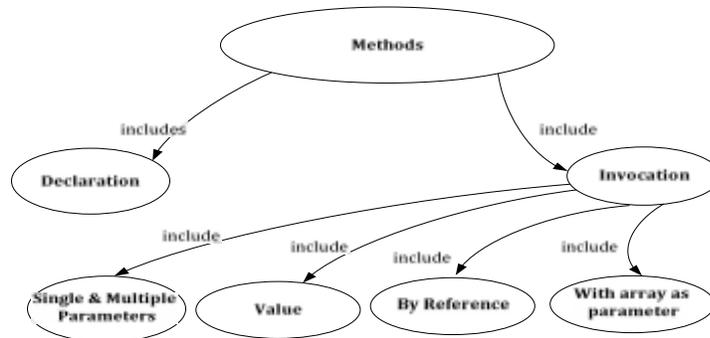
Unit-3: Looping and Control Breaks



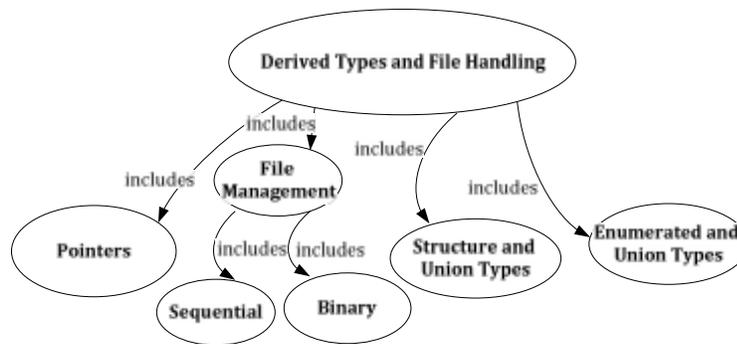
Unit-4: Arrays



Unit-5: Methods



Unit-6: Derived Types and file handling



Assessment:

The weightage of CIE and University examination shall be as per the University regulations. Composition of CIE shall be

For Theory						
Assessment Code	Assessment Type	Duration of each	Occurrence	Each of marks	Weightage in CIE of 40 marks	Remarks
A1	Quiz	45 mins	2	20	4X2=8	Taken at the end of unit 3 and 5.
A2	Unit Test	55 mins	3	30	4X3=12	Taken at the end of unit 2, 4 and 6.
A3	Internal Examination	3 hours	1	60	15X1=15	-

A4	Assignment	2 weeks	1	20	5X1=5	-
For Practical						
Assessment Code	Assessment Type	Duration of each	Occurrence	Each of marks	Weightage in CIE of 20 marks	Remarks
A5	Quiz	45 mins	2	20	4X2=8	Taken at the end of 3 and 5.
A6	Internal	2 hours	2	40	4X2=8	
A7	Assignment (including Viva)		2	10	2X2=4	-

- ❖ A4 Guideline
  - A teacher shall provide minimum 20 questions for assignment at the starting of the semester.
  - Questions for assignment cover all the units equally and it shall be assess at regular interval as per completion of unit.
  - Student shall receive up to 10% penalty of full marks on 2 days late submission, and zero marks if no submission.
- ❖ Syllabus for each CIE parameter shall be covered by the date of the corresponding test.
- ❖ No make-up work shall be accepted for missed or failed tests.
- ❖ Syllabus for each CIE parameter shall be covered by the date of the corresponding test.

### Course Assessment with Course Outcomes Mapping

Assessment	Course Outcomes								
	C01	C02	C03	C04	C05	C06	C07	C08	C09
A1	✓	✓	✓	✓	✓	✓	✓		
A2	✓	✓	✓	✓	✓	✓	✓	✓	✓
A3	✓	✓	✓	✓	✓	✓	✓	✓	✓
A4			✓	✓	✓	✓	✓	✓	✓
A5			✓	✓	✓	✓	✓		
A6			✓	✓	✓	✓	✓	✓	✓
A7			✓	✓	✓	✓	✓	✓	✓

### Question Bank:

Question Bank must be prepared which consists of several types of questions namely Multiple Choice Questions, Fill in the blanks, Short type questions, Long type questions and Comprehensive exercises. Comprehensive exercises will be applicable for units 3,4,5 and 6.

### Academic Honesty:

Coursework is assumed to be accomplished individually (otherwise stated). Any portion of submission taken directly from anywhere (like statements in assignment/report etc.) without modification must be accompanied with the properly formatted reference giving credit to the author and to the source.

### UFM:

- ❖ If two or more submitted answer papers and/or practical code are too similar for coincidence, a penalty shall be imposed that shall usually be the same for the student who did the original as for the one copying from it.
- ❖ Any ascertained fact of breaking institute policy shall be associated with one or all of the following: (i) zero marks for the work; (ii) report to the Programme coordinator; (iii) report to the Director.

### Discussion Group:

Students are welcome to post on the Course Discussion Board available on Department of computer science View Course Webpage. It is responsibility of the concern course teacher to maintain Discussion Board.

### Attendance:

- ❖ Attendance means being present for the entire class session. Those arriving significant late or leaving significantly early without prior permission shall be counted as ABSENT for the entire class session.
- ❖ Concern teacher shall clearly state his/her attendance policies at the first class meeting.