GUJARAT TECHNOLOGICAL UNIVERSITY
MASTERS IN COMPUTER APPLICATION
Year – I (Semester – I) (W.E.F. JULY 2017)

Subject Name: Fundamentals of Programming – 1
Subject Code: 3610001

1. Objectives:
- To learn about the data types, operators and functions in C programming language.
- To be able to write code in C programming language for simple problems

2. Prerequisites: Basic Mathematics and knowledge about number systems

3. Course Contents:

Sr. No.	Course Content	No. of Sessions
1	**Unit 1: Introduction to C** Structure of a C Program, First C Program, Files used in a C Program, Compiling and executing C Program, Compiling and executing C Programs, Using comments, keywords, identifiers, Basic data types in C, Variables, Constants, Input/OutputStatement in C, Operators in C, Programming examples, Type conversion and Typecasting.	07
2	**Unit 2: Decision Control and Looping Statements** Introduction to Decision Control Statements, Conditional branching statements, Iterative Statements, Nested Loops, break and continue statements, goto statement	07
3	**Unit 3: Functions** Introduction, Using Functions, Function Declaration/Function Prototype, Function Definition, Function call, return statement, Passing Parameters to the function, scope of variables, Storage classes, Recursive Functions, Types of recursions, Tower of Hanoi, Recursion versus Iteration	10
4	**Unit 4: Arrays** Introduction, Declaration of arrays, Accessing elements of the Array, Storing values in Arrays, Calculating the length of the array, Operations that can be performed on Arrays, *Introduction of Pointers*, One-dimensional arrays for inter-function communication, two-dimensional arrays, Operations on two-dimensional arrays, Passing two-dimensional arrays to functions, multidimensional arrays, Sparse matrices , Applications of Arrays	10

5	Unit 5: Strings	6
	Introduction, Supressing input, String taxonomy, Operations on Strings, Miscellaneous String and Character functions, Array of Strings	

4. Text Book(s):

1. Reema Thareja. "Programming in C",2nd Edition, Oxford University Press

5. Other Reference Books:
1. Programming in C, by Pradip Dey & Manas Ghosh, Publisher – Oxford
2. Programming in ANSI C, by Balagurusamy, Publisher - Tata McGraw Hill.
3. Programming with ANSI and Turbo C, by Ashok N Kamthane, Publisher – Pearson Education.

6. Unit wise coverage from Text book(s):

Unit 1	Topics
I	Chapter 2
II	Chapter 3
III	Chapter 4
IV	Chapter 5
V	Chapter 6

7. Accomplishments of the student after completing the course:

After completion of the course students should become capable of solving problems using computers through C programming language.

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Year – I (Semester – I) (W.E.F. JULY 2017)

Subject Name: Fundamental of Web (FoW)
Subject Code: 3610002

1. Objectives:

1. Students will learn about the opportunities, challenges and techniques for developing websites built with the new resources provided by HTML5.
2. Students will learn about the evolving principles and standards for constructing accessible websites; will understand different classes of disabilities and the available techniques for rendering websites useful to those with disabilities.

2. Prerequisites: Working knowledge of Internet

3. Course Contents:

Unit	Course Content	No. of Sessions
1	**Unit 1: Introduction to Web and HTML 5** **History of internet and Web** **Key Terminology:** Internet Protocols, The Client-server Model, Domain Name System, Uniform Resource Locator, Hyper Text Transfer protocol, Web Servers **Introduction to HTML5;** New structural elements of HTML5 (Building an HTML5 Starter document, Using header Element to create a site Header, Using the hgroup element to group headings, Creating navigation with nav element, Using the new article element, Grouping content with section element, Creating a side bar with the aside element, Using the footer element, Using the HTML5 outliner to ensure the correct structure, **Grouping text level and redefined Semantics:** making up figures and Captions with the figure and figcaption elements, Marking up the date and time with the time element, making the Native Toggle Widget with the details element, using the address element for contact information, Highlighting text with mark element, using s element to show inaccurate or irrelevant element., changes to existing elements, wrapping links around elements, Adding semantic information with Microdata	10
2	**Unit 2: Introduction to CSS and Web Forms** Creating a Responsive Design with CSS3 media query, Using custom fonts with @font-face, Making buttons with css Gradients and multiple backgrounds, Enhancing a site with transformations and Transitions, creating animations with CSS **HTML5 Web Forms:** HTML4 input types, Creating a form to collect contact information, creating a search form with input type=search, creating calendar and time controls, Creating a number picker, Creating a slider (without javascript), Creating a color picker, Displaying results with output	10

		element, Using Form Placeholder Text, creating an autocomplete feature with list and datalist, Tracking the completion of a task with the progress element, measuring with meter element, Jumping ro a form element when the page loads, Allowing multiple entries, Basic validations with required attribute, writing your own validation rules, limiting user input, customizing and styling the form, error messages,	
3	**Unit 3: Drawing with Canvas** Canvas overview, Laying a Grid on canvas, Canvas tools, Drawing polygons with a Path, drawing Arcs and Circles, Canvas transformations,	6
4	**Unit 4: Introduction to JavaScript** Overview, JavaScript design principles, Embedding JavaScript into a web page, JavaScript Syntax, JavaScript Objects, DOM, JavaScript Events, Form validations,	6
5	**Unit 5: Web Media** **Embedding Video with HTML5:** including video with video element, enabling video for all browsers, creating a video with subtitles and captions, media API, Making your own custom controls **Embedding Audio with HTML5:** including audio with audio element, element, enabling audio for all browsers, media API, creating a beat mixer, adding streaming video	8

4. Text Book(s):

1. Randy Connolly, Ricardo Hoar, Fundamentals of Web Development, ISBN-978-93-325-7527-1,Pearson
2. HTML5 Developer's cookbook, Chuck Hudson, Tom Leadbetter, ISBN-978-81-317-8690-1, Pearson

5. Other Reference Books:
1. Steven Holzner ,HTML Black Book , Dreamtech Press
2. Jacob Seidelin, HTML5 Games, creating Fun with HTML5,CSS3 and WebGL, Wiley
3. Faithe Wempen, "Step by Step HTML 5", South Asian Edition, Microsoft Press and PHI Learning
3. Wendy Willard, "HTML: A Beginner's Guide 5/E", 5th Edition, McGraw Hill
4. HTML Complete Reference by Thomas A. Powell, Publisher Tata McGraw Hill
5. Teach yourself Java Script in 24 by Michael Moncur Publisher: Pearson Education

6. Unit wise coverage from Text book(s):

Unit 1	Book#	Topics
I	1	Chapter 1
	2	Chapter 1,2
II	2	Chapter 4,5
III	2	Chapter 6
IV	1	Chapter 6
V	2	Chapter 7,8

Suggested Tutorial

1) **Location Awareness (Book 2 Chapter 10): Geolocations Overview:** determining and mapping your location with getcurrentposition,, Determining distance with Position, Options, Following a moving location with watchPosition,

2) **Front end framework :** Overview of any front end framework for project like BootStrap

Case study:
1. Using all the new elements to Build a news Page
2. Using all the new elements to Build a search results Page
3. Marking up an article page with comments
4. Create a web form using all HTML5 input types
5. Using HTML5 and Bootstrap prepare your website

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Year – I (Semester – I) (W.E.F. JULY 2017)

Subject Name: Program Design Techniques (PDT)
Subject Code: 3610003

1. Objectives:
1. To acquire logical reasoning ability along with various processes and techniques to develop logic and algorithms for solving variety of problems
2. To get orientation for writing efficient programs (codes)
3. To learn some approaches for debugging of programs

2. Prerequisites: Attitude of Enjoying Logical Reasoning and Thought Process

3. Course Contents:

Sr. No.	Course Content	No. of sessions
1	**Unit 1: Introduction To Computer Problem Solving** Introduction, The Problem-Solving Aspect, Top-Down Design, Implementation of Algorithms, The Efficiency of Algorithms	**04**
2	**Unit 2: Fundamental Algorithms** Exchanging The Values of Two Variables, Supplementary Problems, Counting, Supplementary Problems, Summation of a Set of Numbers, Supplementary Problems, Factorial Computation, Supplementary Problems, Sine Function Computation, Supplementary Problems, Generation of The Fibonacci Sequence, Supplementary Problems, Reversing The Digits of an Integer, Supplementary Problems, Base Conversion, Supplementary Problems, Character To Number Conversion, Supplementary Problems	**12**
3	**Unit 3: Factoring** Finding a Square Root of a Number, Supplementary Problems, The Smallest Divisor of an Integer, Supplementary Problems, Greatest Common Divisor of Two Integers, Supplementary Problems, Generating Prime Numbers, Supplementary Problems, Computing Prime Factors of an Integer, Supplementary Problems, Generation of Pseudo-Random Numbers, Supplementary Problems, Raising a Number To a Large Power, Supplementary Problems, Computing The n-th Fibonacci Number, Supplementary Problems	**12**
4	**Unit 4: Array Techniques** Array Order Reversal, Supplementary Problems, Array Counting Or Histogramming, Supplementary Problems, Finding The Maximum Number in a Set, Supplementary Problems, Removal of Duplicate Numbers From an Ordered Array, Supplementary Problems, Partitioning an Array, Supplementary Problems, Finding The k-th Smallest Element, Supplementary Problems, Longest Monotone Subsequence, Supplementary Problems	**12**

5	**Unit-5: Searching And Recursive Algorithms** **Searching:** Sequential Search: (a) Search in an Unordered Array, (b) Search in an Ordered Array; Binary Search, Hash Searching **Recursive Algorithms**: Introduction, Linear Recursion, Binary Recursion, Implementation of Recursion in (a) Factorial, (b) Fibonacci Sequence, (c) Summation of N Terms, (d) Greatest Common Divisor (GCD), (e) Binary Search	**06**

4. Text Book(s):
1. R.G.Dromey "How to Solve it by Computer ", PHI , 1998

5. Other Reference Books:
1. Brian W.Kernighan & Dennis Ritchie "C Programming Language", PHI, 1990
2. Jeri R. Hanly and Eliot B. Koffman "Problem Solving and Program Design in C" Pearson Education, VII Edition, 2012
3. Deitel and Deitel "C How to Program ", Addisson Wesley , 2001
4. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004
5. Byron.S.Gottfried "Schaum's Outline of Programming with C", 2nd Edition, 1996

6. Unit-wise Coverage from Text book(s):

NOTE: Faculty members are expected to generate similar examples on their own in addition to the examples presented in the book. Some algorithms (for example, Sequential Search, and Recursion examples may not be directly available in the book but these are simple ones, which can easily be handled by the faculty members). Secondly, these exercises should be implemented in FOP-1 subject.

Unit 1	Topics
I	Chapter 1
II	Chapter 2
III	Chapter 3
IV	Chapter 4
V	Chapter 5: 5.7, 5.8; Chapter 8: Introduction

7. Accomplishment
Students will acquire ability to develop logic and algorithm for solving variety of problems. They will be able to identify portions of the code (program) which can be made more efficient. They will also be able to debug the programs faster.

GUJARAT TECHNOLOGICAL UNIVERSITY
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Year – I (Semester – I) (W.E.F. JULY 2017)

Subject Name: Fundamentals of Computer organization (FCO)
Subject Code: 3610004

1. Objectives:
- To be able to understand the elements of Computer Organization and Architecture
- To understand the hardware operation of digital computers

2. Prerequisites: Basic Mathematics and knowledge about number systems

3. Course Contents:

Sr. No.	Course Content	No. of Sessions
1	**Unit 1: Basic Components of a digital computer.**	01
2	**Unit 2: Basic Working of Peripheral devices** **(Circuit Diagrams not necessary)** Key board , Mouse, Display Unit ,Printer, Multimedia Projector, Scanner, *USB Ports, Network Adapters*	04
3	**Unit 3: Introduction to Number System** Decimal System, *Two-state* Devices, Counting in Binary System, Binary Addition and Subtraction, Converting Decimal Number to Binary Negative Numbers, Use of Complements to represent negative numbers *in binary and* other number systems, Binary Number Complements Weighted Code, BCD Code, Octal and Hexadecimal Number System	09
4	**Unit 4: Boolean Algebra and Logic Gates** Fundamental Concepts of Boolean Algebra, Logic Gates, Logical Multiplication, AND Gate and OR Gate, Complementation and Inverts Evaluation of logical Expression, Evaluation of an Expression containing Parenthesis, Basic Laws of Boolean Algebra, Proof by Perfect Induction Simplification of Expressions, De Morgan's Theorems, Basic Duality of Boolean Algebra, Derivation of a Boolean Algebra, Interconnecting Gates Sum of Products And Product of Sums, Derivation of POS Expression Derivation of 3 input variables expression, NAND Gates and NOR Gates K-Map Method for Simplifying Boolean Expressions, Subcubes and Covering, POS Expression and Don't Care, Design Using NAND Gates Only, Design Using NOR Gates	09
5	Unit 5: **Basic Concepts of Sequential Logic** *Overview of Synchronous and Asynchronous circuits* RS Flip Flop, A Basic Shift Register, *Binary Counter*	03

6	**Unit 6: Basic Concepts of Combinational Logic**	04
	Construction of ALU, Integer Representation, 1 bit Binary Half Adder 1 bit Binary Full Adder, Positive and Negative Number, Addition in 1's Complement System, Addition in 2's Complement System, Shift Operation Logical and Modulo Operations (Circuit Diagrams not necessary), Basic working and application of Multiplexer	
7	**Unit 7: Introduction to Memory and Storage Devices**	04
	Random Access Memories, Basic Memory Cell, Static RAM (Circuit Diagrams not necessary), Dynamic RAM (Circuit Diagrams not necessary) ROM, Magnetic Disk Memories	
8	**Unit 8: Introduction to Buses**	01
	Interfacing Buses (Circuit Diagrams not necessary), Concepts of Address Bus, Data Bus and Control Bus, Bus Width (Circuit Diagrams not necessary)	
9	**Unit 9: Introduction to Control Unit**	02
	Construction of Instruction Word, Instruction Cycle and Execution Cycle organization of Control Registers	
10	**Unit 10: Basic Concepts of Computer Organization**	06
	Instruction Word Formats-Number of Addresses, Representation of Instruction and Data, Addressing Techniques, Direct Addressing, Immediate Addressing, Relative Addressing, Indirect Addressing, Indexed Addressing	
11	**Unit 11: Introduction to Intel 8086 Architecture**	07
	Introduction, Bus Interface Unit, Execution Unit, Introduction to Instruction Set, Data Addressing Modes, Instruction Format, Working of MOV, ADD, SUB, MUL, DIV,CMP, IMC, DEC, NEG, AND, OR, NOT, XOR, instructions	

4. Text Book(s):

1. A. Digital Computer Fundamentals, Tata McGraw Hill, 6th Edition, Thomas C. Bartee
2. B. Microprocessor 8086 – Architecture, Programming and Interfacing, Prentice Hall India (PHI), Sunil Mathur

5. Other Reference Books:
1. Computer System Architecture, PHI/Pearson Education, 3rd Edition, M. Morris Mano

6. Unit wise coverage from Text book(s):

Unit 1	Book#	Topics
I	**1**	Chapter – 1: 1.7
II		**To be covered from Internet/latest books**

III	1	Chapter – 2: 2.1 to 2.13
IV	1	Chapter – 3: 3.1 to 3.22
V	1	Chapter – 4: 4.1, 4.7, 4.8
VI	1	Chapter – 5: 5.1 to 5.4, 5.6 to 5.8, 5.14, 5.15, 5.19, 5.20
VII	1	Chapter – 6: 6.1, 6.2, 6.7 to 6.10
VIII	1	Chapter – 8: 8.2, 8.3
IX	1	Chapter – 9: 9.1, 9.2
X	1	Chapter – 10: 10.1 to 10.9 (Except 10.6)
XI	2	Chapter – 2(2.1, 2.2), Chapter – 4(4.1, 4.2.1, 4.3, 4.5)

7. Accomplishments of the student after completing the course:

After completion of the course students will get the knowledge of computer organization and architecture and will know the actual working and organization of digital computer system.

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MASTERS IN COMPUTER APPLICATION
Year – I (Semester – I) (W.E.F. JULY 2017)

Subject Name: Communication Skills (CS)
Subject Code: 3610005

1. Objectives:

- Development of verbal and written communication skills.
- Development of skills for interviews, group communication, and effective presentation
- Learning techniques for effective reading, technical writing, etc.
- Learning basics of vocabulary, grammar

2. Prerequisites: Willingness to sharpen communication skills

3. Course Contents:

Sr. No.	Course Content	No. of Sessions
1	**Introduction and Basics of Technical Communication** Importance of Communication, Basics of Communication, Purpose, Audience, Cross- Cultural Communication, Language, Communicative Skills, Effective Communication, Modes of Communication, Objectives and Characteristics of Technical Communication, Process of Communication, Levels of Communication, Flow of Communication, Communication Networks, Visual Aids in Technical Communication	05
2	**Effective Speaking and Conversation** Introduction, Paralinguistic Features, Barriers to Speaking, Types of Speaking, Persuasive Speaking, Public Speaking, Conversations, Telephonic Conversations and Etiquette, Dialogue Writing	06
3	**Effective Presentation Strategies, Interviews and Group Communication** Introduction, Planning, Outlining and Structuring, Nuances of Delivery, Controlling Nervousness and Stage Fright, Visual Aids in Presentations, Objectives of Interviews, Types of Interviews, Job Interviews, Media Interviews, Press Conferences, Forms of Group Communication, Use of Body Language, Discussions, Group Discussions, Organizational GD, GD as Part of Selection Process, Meetings, Conferences, Symposia and Seminars, Negotiations	09
4	**Technical Writing, Words, Phrases, and Sentences** Introduction, Audience Recognition/Analysis, Language, Elements of Style, Techniques for Good Technical Writing, Referencing and Styling, Right Words and Phrases, Sentences	04
5	**Letters, Memos and Email** Introduction, Letter Writing, Business Letters, Cover Letters, Resumes, Memos, Emails	05

6	**Reports**	03
	Introduction, Characteristics of a Report, Categories of Reports, Formats, Prewriting, Structure of Reports, Types of Reports, Writing the Report	
7	**Research Paper and Dissertation**	03
	Introduction, Characteristics and Components of a Research Paper, Dissertation	
8	**Introduction to Modern Communication Media**	03
	Introduction, Technology Based Communication Tools, Positive Impact of Technology-enabled Communication, Negative Impact of Technology-enabled Communication, Selection of Appropriate Technology, Effectiveness in Technology based Communication	
9	**Vocabulary**	05
	Introduction, A Brief History of Words, Using the Dictionary and Thesaurus, Changing Words from One Form to Another, Word Formation : Prefixes and Suffixes, Synonyms and Antonyms, Idioms, Confusables, One-Word Substitutes, Homonyms, Homophones, Eponyms, Phrasal Verbs	
10	**English Grammar**	05
	Introduction, Nouns, Gerunds, Infinitives, Subject-Verb Agreement, Tenses, Active and Passive Voice, Conditional Sentences, Adjectives and Degrees of Comparison, Adverbs, Conjunctions, Prepositions, Articles	

4. Text Book(s):

1. Meenakshi Raman & Sangeeta Sharma, "Technical Communication – Principles and Practice", 2nd Edition, Oxford University Press, 2011.

5. Other Reference Books:

1. Herta A Murphy, Herbert W. Hilderbrandt, Jane P Thomas, "Effective Business Communication" 7th Edition, Tata McGraw Hill Publication
2. Hedwig Lewis, "Body Language", Response Books
3. Ashraf Rizvi, "Effective Technical Communication", TMGH Publication
4. Paul V. Anderson, "Technical Communication – A Reader Centred Approach", 6th Edition, Thomson Publication
5. Huckins Thomas, "Technical Writing and Professional Communication", McGraw Hill Publication
6. Penrose, Rasberry, Myers, "Business Communication for Managers – An Advanced Approach", 5th Edition, Thomson Publication
7. Bovee, Thill, Schatzman, "Business Communication Today" 7th Edition, Pearson Education
8. Andrea J. Rutherfoord, "Basic Communication Skills for Technology", 2nd Edition, Pearson Education
9. Sharon J. Gerson, Steven M. Gerson, "Technical Writing – Process & Product", 5th Edition, Pearson Education
10. Asha Kaul, "Effective Business Communication", Prentice-Hall India Pvt. Ltd.
11. Daniel G. Riordan, Steven E. Pauley, "Technical Report Writing Today", 8th Edition, Indian Adaptation, Biztantra Publication
12. Sunita Mishra, C. Murli Krishna, "Communication Skills for Engineers", Pearson

Education
13. Leena Sen, "Communication Skills", 2nd Edition, PHI
14. Kenneth W. Davis, "Business Writing and Communication", TMGH Publication
15. B. N. Basu, "Technical Writing", Prentice-Hall India Pvt. Ltd.
16. Matthukutty M. Monippally, "Business Communication Strategies", TMGH Publication
17. Wren & Martin, "High School English Grammar and Composition"on.

6. Unit wise coverage from Text book(s):

Unit 1	Topics
I	Chapter 1,3
II	Chapter 6,7
III	Chapter 8,9,10
IV	Chapter 13,14
V	Chapter 17
VI	Chapter 18
VII	Chapter 20
VIII	Chapter 23
IX	Chapter 24
X	Chapter 25

Suggested Assignments for Continuous Evaluation Component:

- Group Discussion Sessions
- Mock Interviews
- Write their own Resume
- Assignment on Report Writing, Letter Writing and Memo Writing
- Assignment on English Grammar

7. Accomplishments of the student after completing the course:

- Gain an insight into the types of communication
- Build good body language and communication skills while making presentations in a classroom, or boardroom.
- Would be better equipped in writing letters, technical reports etc.

GUJARAT TECHNOLOGICAL UNIVERSITY
MASTERS IN COMPUTER APPLICATION
Year – I (Semester – I) (W.E.F. JULY 2017)

Subject Name: Software project - I
Subject Code: 3610006

Guidelines:

Team: group of Max 2 Person

This is aimed to apply the learned concepts, procedures and tools to architect or build an application to develop the skill of application development using acquired knowledge. The students should be motivated to develop the model of application nearer to real life applications and present their work during the evaluation of the projects by the examiners.

☐☐A working web application on fundamental of Web and HTML 5 may be developed but before developing working application a prototypical model of Input Design and Output Design or Reports may be developed using any designing tools for understating the concept behind it.

Option 1: Web application must explore the HTML5, CSS, JavaScript, Theme/template and Front end framework (e.g. BootStrap). Use any Database to store information.

Web application must be responsive and dynamic.

Suggested Web Applications

1) University Web site
2) Online Book Store
3) eCommerce Web site
4) Online Library System
5) Online Shopping
6) Railway Reservation System

PS: Above list is a suggestive one. You may select any dynamic application.

Expected Outcome:

The objective of the Application Development is to make students aware about the industry based process and workings. As a result, working application that meet with the industry standards should be populated.

There will not be any compulsion to prepare a project report for the students but an application and supportive documents should be self-explanatory, so that evaluator may get the detail about the application developed and can evaluate the students as per the evaluation criteria are given in the last part of this annexure.

Criteria for Evaluation of Applications Developed:

		Marks
Project	**Template (customized) / Theme**	**10**
	Library (CSS) / 2D, 3D Graphics	**10**
	JavaScript Validation / Web storage	**10**
	Online Framework / Animation	**10**
Presentation	Communication and explanation	**10**
Performance	Practical Code changes to individual	**30**

Suggested Book for Game:

1. Jacob Seidelin, HTML5 Games,creating Fun with HTML5,CSS3 and WebGL , Wiley