GUJARAT TECHNOLOGICAL UNIVERSITY

MCA Sem-2/ B.E. Sem-2 & 7 / B.Pharm. Sem-2 & 7/ Diploma Engineering Sem-2 & 5 (01-07-2013)

Subject Name: **Contributor Personality Development**
Subject Code: **1990001**

Table-I -For MCA/B.E. / D.E

Table-I						
Teaching Scheme				*Evaluation Scheme*		
Theory (Hrs.)	**Tutorial (Hrs.)**	**Practical (Hrs.)**	**Credit**	***University Exam (E)***	***Mid Sem Exam (Theory) (M)***	***Practical (Internal)***
4	0	0	4	70	30	50

***For the Evaluation Scheme of Diploma Engineering Sem – 2, please refer the link**
http://www.gtu.ac.in/Syllabus/New_Diploma/sem-2/Pdf/3990001.pdf

Table-I –For B.Pharm only

Table-II						
Teaching Scheme				*Evaluation Scheme*		
Theory (Hrs.)	**Tutorial (Hrs.)**	**Practical (Hrs.)**	**Credit**	***University Exam (E)***	***Mid Sem Exam (Theory) (M)***	***Practical (Internal)***
4	0	0	4	80	0	20

Note:

1. **This subject is compulsory.**
2. **4 Credits will be over and above the existing credit structure.**
3. **This subject will be taught by faculty of English. For B. Pharm., the institute will have to nominate one faculty member for the subject.**
4. **In Institutes, where as the load is not managed by the lecturers of English only, please nominate the other faculty for teaching the course of Contributor Personality Development.**

(A) Background

The Contributor Personality Program has been designed keeping in mind the following:

1.0 Technology students should not only be excellently trained in the technological field, they should acquire soft skills if they are to be successful. Every student must also learn about the techniques of effective participation in a group discussion. He/she must learn to prepare his/her resume and he/she should also be groomed for presenting himself/herself at an interview.

2..0 There is a great need to equip students with not only the right skill-sets but also the right mindsets.

3.0 The 'mindsets' needed in today's environment must support both (i) effective action and (ii) values and service oriented behavior.

Effective action without human values can lead to personal benefits for individuals but a long-term cost to both nation and society. Human values without effective action can lead to an inability on the part of the individual to perform and flourish in today's environment.

This combination of effectiveness with human values is crystallized in the concept of "contributor ship".

4.0 Students who adopt and develop the right mindsets early in their professional career are able to bring about a positive and sustainable change in their overall personality.

They are able to grow the right approaches to their peers, seniors, industry, and their own future. They become more responsible and capable of shaping their own lives.

Therefore, the program may be rightly called a "Contributor Personality Development Program".

5.0 Any program of this sort must, in order to be effective, be inspired and guided by a high ideal and principles/ practices flowing from that ideal.

The Contributor Personality Program is guided by the ideals and ideas of Swami Vivekananda – who represented in his leonine personality the highest ideals of human values combined with effective action.

(B) Course Outline

Topics 1-6 relate to the basic axioms or "mental models" that students carry about themselves, about success, careers, contribution, etc. The right mental models are a necessary prerequisite for developing into a Contributor.

Topics 7-12 are 6 core practices that will help a student manifest the ideal of contributor ship in one's life.

Topics 13-15 relate to the students capability to connect into the job-market.

Topic	Course Title
1	**Who is a Contributor** Student develops an appreciation of who the Contributors are and how they fundamentally differ from Non-contributors in their overall approach to work, to other human beings, to society as a whole.

2	**The Contributor's identity** Student develops his/ her own answer to the question "who am I?" The student becomes aware of the fact that Non-contributors usually define themselves in terms of what they have acquired in life (e.g. qualifications, position, years of experience, etc.) while Contributors define themselves in terms of what they will become or accomplish (e.g. capacity to deliver, commitment and ownership of the organization's purpose, etc.).
3	**The Contributor's vision of success** The student explores the meaning of success in his life. Through this exploration, the student is expected to recognize that Contributors have a wider definition of success than Non-contributors. While Non-contributors define success in terms of material success, achievement, external impact, etc., Contributors are able to widen this definition of success to include personal fulfillment, development of self-esteem, ongoing development of personal capabilities etc.
4	**The Contributor's vision of career** The student learns to distinguish between an "acquisitive career" and a "contributive career". An acquisitive career is one in which the career-seeker is focused on acquiring higher position, higher salary, more benefits etc. This preoccupation with selfish interests often damages the individual's career, as well as, damages the organization and society. A contributive career is one where the career-seeker is focused on contributing, with rewards being a by-product of the contributions made.
5	**The scope of contribution** The student learns to perceive that in all type of work, every type of role, there is a possibility of contributing at multiple levels – contributing to self, contributing to organization, and contributing to society. The student also appreciates the difference between "acquisition for self" and "contribution to self" – the former being material acquisition and the latter being conscious development of oneself through the medium of one's career.
6	**Embarking on the journey to contributor ship** The student recognizes the fundamental "building blocks" for becoming a Contributor – the first building block being a shift from a "victim" to being a "creator of one's destiny"; the second building block being acceptance of the ideal of contributor ship; the third building block being the willingness to take full responsibility for one's own development; the fourth building block being the capacity to reflect on one's development and make appropriate modifications.

7	**Design Solutions** When faced with a challenge, the Contributor's first response is: "Can we find a solution?" This is unlike a Non-contributor who may respond to the challenge by trying a little and giving up, blaming others, or finding excuses to cover up the issue. Whereas, the Contributor finds a solution. In other words, the Contributor develops the capacity to find solutions through continuous practice and learning from other Contributors. In this topic, students learn the importance of willingness and ability to find solutions.
8	**Focus on value** What does creating value mean? It means making a positive difference, a tangible impact, a specific contribution to any situation. This positive difference or impact can be in the form of achieving a specific goal, creating a product, creating 'human touch' in a particular interaction, or enhancing one's own capacity, or the capacity of one's colleagues and team- mates. Contributors are therefore extremely result-focused, but the result is measured in terms of value created. In this topic, students learn to clarify the meaning of the word "value" and how value is created in various situations.
9	**Engage deeply** Contributors are instantly distinguished by the way they approach work. They get involved. They are enthusiastic. They go deep into the subject. In short, Contributors love what they do. This is in direct contrast to Non-contributors who want to do only what they love - an approach that seems reasonable until you realize that life and workplaces have so much variety that you may very often be called upon to do tasks that seem unpleasant or boring until you get involved. In this topic, students learn the importance of engaging deeply with whatever work they do – at work, in study, in personal life.
10	**Think in Enlightened Self-interest** Contributors think in Enlightened Self-Interest. In every situation they get into, they find a way to create something good for self and for all at the same time – including team mates, bosses, customers and their organization. Contrasting to this is the mindset of a Non-Contributor. Such a person is only concerned with his/ her own self-interest in a situation. He/she is not concerned about the impact (positive or negative) on the other person. This leads to unpleasant

	situations, broken relationships, unhappy team-mates, subordinates, and bosses, and lower trust in any situation. Students are expected to learn to appreciate the importance of thinking win-win for all stakeholders and also in various situations.
11	**Practice Imaginative Sympathy** One of the unique qualities of Contributors is their ability to appreciate and understand others' life situation, others' mental condition, and others' point of view. How do they do this? They have consciously developed a 'way of thinking' called 'Imaginative Sympathy'. In this way of thinking, they are able to give due importance to the human aspects of a situation, and not just the technical or commercial aspects. But this is not all. Imaginative Sympathy goes beyond looking at the human aspects of the situation. It also means that Contributors are able to anticipate possible interactions or reactions, they are able to take a multi-dimensional view of a situation and they are able to bring about changes or results while taking everybody along with them. Imaginative Sympathy translates itself into active concern for others. Students will learn the importance and consequences of Imaginative Sympathy in a workplace situation.
12	**Demonstrate Trust Behavior** Contributors recognize that they are able to achieve results and make contributions with the help of other human beings. They receive this help if and only if they are trusted and, in turn, trust. Contributors practice trust behavior from very early in their career, thereby building a huge trust balance (like a bank balance) over their career and relationships. The term Trust Behavior may be described as character-in-action. This includes keeping one's word and commitments, staying with a task, acting with integrity in every situation, making sure that there is complete transparency in one's actions and interactions, etc. Students are expected to learn to develop a deep appreciation of trust behavior and how it is practiced.
13	**Resume Building** In this topic, students learn to develop a resume for the job-market. Students will learn to develop both a generic resume and resumes specific to some types of jobs. Students learn about best practices and common errors in developing their resume.

	Most important, students learn to analyze the jobs offered and present themselves in terms of their potential / willingness to contribute to the job.
14	**Group Discussions (GDs)** In this topic, students learn (i) how to participate in a group discussion from the contributor's view-point (i.e. how to speak) (ii) how to contribute to the development of the topic (i.e. what to speak) and (iii) to develop the Contributor's view-point on various GD topics (i.e. how to interpret a topic of discussion from the point of view of a contributor)
15	**Interview Skills** In this topic, students learn about (i) common interview questions and how to develop answers (ii) typical challenges faced in interviews beyond the questions (such as body language, grooming, presentation) (iii) most important, the student learns the importance of trust building and creating confidence in the interview.

(C) Course Plan

The course duration is 48 hours. It can be conducted in sessions of 1 hour each or some of the sessions can be combined as 2 hours each. The course plan is as follows –

Topic 1: Who is a Contributor – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol I) – 1 hour Presentations and Projects	**3 hours**
Topic 2: The Contributor's identity – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol I) – 1 hour Presentations and Projects	**3 hours**
Topic 13: Resume Building – 2 hours for Concepts, Tools, and Techniques – 2 hours for Projects	**4 hours**
Topic 3: The Contributor's vision of success – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol I) – 1 hour Presentations and Projects	**3 hours**
Topic 4: The Contributor's vision of career – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol I) – 1 hour Presentations and Projects	**3 hours**
Topic 5: The scope of contribution – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol I) – 1 hour Presentations and Projects	**3 hours**

Topic 6: Embarking on the journey to contributorship – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol I) – 1 hour Presentations and Projects	**3 hours**
Topic 14: Group Discussions (GDs) – 2 hours for Concepts, Tools, and Techniques – 2 hours for Projects and Practice	**4 hours**
Topic 7: Design Solutions – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol II) – 1 hour Presentations and Projects	**3 hours**
Topic 8: Focus on value – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol II) – 1 hour Presentations and Projects	**3 hours**
Topic 9: Engage deeply – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol II) – 1 hour Presentations and Projects	**3 hours**
Topic 10: Think in Enlightened Self-interest – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol II) – 1 hour Presentations and Projects	**3 hours**
Topic 11: Practise Imaginative Sympathy – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol II) – 1 hour Presentations and Projects	**3 hours**
Topic 12: Demonstrate Trust Behavior – – 2 hours Theory and practice exercises based on Contributor Personality Program Workbook (Vol II) – 1 hour Presentations and Projects	**3 hours**
Topic 15: Interview Skills – 2 hours for Concepts, Tools, and Techniques – 2 hours for Projects and Practice	**4 hours**
TOTAL	**48 hours**

(D) Examination Approach

Total marks: 150. Break-up of marks -

(i) Final exam : 70 marks (equal weightage for topics 1-15)

(ii) Presentations and projects for topics 1-12: 30 marks

(iii) Projects for topics 13-15: 50 marks

(E) Instructional Strategy

1.0 The entire course will use a three-level instructional strategy

Level I: Classroom Explorations

Level II: Projects and Presentations

Level III: Self-study by students

2.0 Level I: Classroom Explorations

1. The Classroom Explorations will be organized around the 'Contributor Personality Program – Study Book'.

   The Study Book may be downloaded by the student from the resource site produced by GTU.

2. The Classroom Explorations involves two kinds of explorations:

   (i) Exploration of key concepts / frameworks such as "contributors vision of success" etc.

   (ii) Exploration of the examples provided in the CPP Study Book.

3. The Classroom Explorations will be supported by Session Guide Sheets available online in the CPP ActivGuide.

3.0 Level II: Projects & Presentations

1. The entire Classroom Exploration process will be supplemented by projects and presentations.
2. Session Guides will provide sample topics for projects and presentations. Individual instructors will be free to develop their own projects/ presentation topics also.
3. This will not only enhance conceptual clarity but also build presentation, public-speaking, report writing, and group discussion skills of the students.

4.0 Level III: Self Study by students

1. Students will be given extensive learning support (upto 400 learning units) in the ActivGuide website. This will include videos, presentations, tests, etc.
2. Students can refer to ActivGuide on their own time through internet.

(F) Reference Material

Basic Study Material

SN	Author/s	Name of Reference	Publisher	Edition
1	Illumine Knowledge Resources Pvt. Ltd. (Downloadable from the internet)	Contributor Personality Program Workbook (Vols I & II)	Illumine Knowledge Resources Pvt. Ltd	Latest
2	Illumine Knowledge Resources Pvt. Ltd. (will be made available to all students on the Internet)	Contributor Personality Program ActivGuide	Illumine Knowledge Resources Pvt. Ltd	Latest

Reference Books

Topic	Course Title	Reference
1	**Who is a Contributor**	1. On Contributors, Srinivas V.; Illumine Ideas, 2011 2. Enlightened Citizenship and Democracy; Swami Ranganathananda, Bharatiya Vidya Bhavan, 1989 3. Personality Development, Swami Vivekananda; Advaita Ashrama
2	**The Contributor's identity**	1. To have or to be, Erich Fromm; Continuum International Publishing Group, 2005 2. The art of being, Erich Fromm; Continuum International Publishing Group, 1992 3. Raja Yoga, Swami Vivekananda; Advaita Ashrama
3	**The Contributor's vision of success**	1. Eternal Values for a Changing Society – Vol IV (Ch 25, 35), Swami Ranganathananda; Bharatiya Vidya Bhavan, 1993 2. Karma Yoga, Swami Vivekananda; Advaita Ashrama
4	**The Contributor's vision of career**	1. Six Pillars of Self Esteem , Nathaniel Branden; Bantam, 1995 2. Mindset: The New Psychology of Success, Carol S. Dweck; Random House Publishing Group, 2007
5	**The scope of contribution**	1. Awakening India, Swami Vivekananda; Ramakrishna Mission, New Delhi, 2011 2. Eternal Values for a Changing Society – Vol IV

		(Ch 35), Swami Ranganathananda; Bharatiya Vidya Bhavan, 1993 3. Lasting Contribution: How to Think, Plan, and Act to Accomplish Meaningful Work, Tad Waddington; Agate Publishing, 2007
6	**Embarking on the journey to contributor ship**	1. Vivekananda: His Call to the Nation, Swami Vivekananda; Advaita Ashrama 2. Eternal Values for a Changing Society – Vol IV (Ch 33), Vol III (Ch 19, 21, 30) Swami Ranganathananda; Bharatiya Vidya Bhavan, 1993 3. Lectures from Colombo to Almora, Swami Vivekananda; Advaita Ashrama
7	**Design Solutions**	1. Why not?: how to use everyday ingenuity to solve problems big and small, Barry Nalebuff, Ian Ayres; Harvard Business School Press, 2003 2. How to Have a Beautiful Mind, Edward De Bono; Vermilion, 2004
8	**Focus on value**	1. The value mindset: returning to the first principles of capitalist enterprise (Ch 8 & 9); Erik Stern, Mike Hutchinson; John Wiley and Sons, 2004 2. Managing for Results, Peter F. Drucker; HarperCollins, 2009
9	**Engage deeply**	1. The Power of Full Engagement: Managing Energy, Not Time, is the Key to High Performance and Personal Renewal, Jim Loehr, Tony Schwartz; Simon and Schuster, 2003
10	**Think in Enlightened Self-interest**	1. The 7 Habits of Highly Effective People, Stephen R. Covey; Simon and Schuster, 2004 2. Creating Shared Value, Michael E. Porter and Mark R. Kramer; Harvard Business Review; Jan/Feb2011, Vol. 89 Issue 1/2
11	**Practice Imaginative Sympathy**	1. Eternal Values for a Changing Society – Vol IV (Ch 8, 10, 23, 35, 37), Swami Ranganathananda; Bharatiya Vidya Bhavan, 1993 2. Eternal Values for a Changing Society – Vol III (Ch 18), Swami Ranganathananda; Bharatiya Vidya Bhavan, 1993
12	**Demonstrate Trust Behavior**	1. The Speed of Trust: The One Thing That Changes Everything, Stephen M. R. Covey, Rebecca R. Merrill, Stephen R. Covey; Free Press, 2008 2. Integrity: The Courage to Meet the Demands of

		Reality, Henry Cloud; HarperCollins, 2009 3. Responsibility at work: how leading professionals act (or don't act) responsibly, Howard Gardner; John Wiley & Sons, 2007
13	**Resume Building**	1. What Color Is Your Parachute? 2012: A Practical Manual for Job-Hunters and Career-Changers, Richard Nelson Bolles; Ten Speed Press, 2011 2. The what color is your parachute workbook: how to create a picture of your ideal job or next career, Richard Nelson Bolles; Ten Speed Press, 2011
14	**Group Discussions (GDs)**	1. Effective Group Discussion: Theory and Practice, Gloria J. Galanes, Katherine Adams; McGraw-Hill, 2004
15	**Interview Skills**	1. What Color Is Your Parachute? 2012: A Practical Manual for Job-Hunters and Career-Changers, Richard Nelson Bolles; Ten Speed Press, 2011 2. The what color is your parachute workbook: how to create a picture of your ideal job or next career, Richard Nelson Bolles; Ten Speed Press, 2011

General References:-

SN	Author/s	Name of Book	Publisher	Edition
1	Swami Ranganathananda	Universal Message of the Bhagavad Gita (Vol 1-3)	Advaita Ashrama, Kolkata	Latest
2	Swami Ranganathananda	Eternal Values for a Changing Society (Vol 1-4)	Bharatiya Vidya Bhavan	Latest
3	Asim Chaudhuri	Vivekananda: A Born Leader	Advaita Ashrama, Kolkata	Latest
4	Swami Vivekananda	Complete Works of Swami Vivekananda (Vol 1-9)	Advaita Ashrama, Kolkata	Latest
5	Swami Vivekananda	Letters of Swami Vivekananda	Advaita Ashrama, Kolkata	Latest

GUJARAT TECHNOLOGICALUNIVERSITY

MASTERS IN COMPUTERAPPLICATION

Year –1(Semester–II) (W.E.F. Dec 2017)

Subject Name: Fundamentals of Programming - II
Subject Code: 3620001

1. Objectives:

1. To be able to understand and use pointers in C programs.
2. To be able to create user defined data types in C
3. To be able to write C application which can do input/output on files.

2. Prerequisites: Basic knowledge of C programming

3. Course Contents:

Sr. No.	Course Content	No. of Lectures
1	**Unit 1: Pointers** Introduction, Understanding Memory Addresses, Address Operator (&), Pointers (Declaring a Pointer, Initializing Pointers, Indirection Operator and Dereferencing, void Pointer, Null Pointer, Use of Pointers), Arrays and Pointers(One-dimensional Arrays and Pointers, Passing an Array to a Function, Differences between Array Name and Pointer), Pointer and String, Pointer Arithmetic (Assignment, Addition or Subtraction on Integer, Subtraction of Pointers, Comparing Pointers), Pointers to Pointers, Array of Pointers, Pointers to an Array, Two-dimensional Arrays and Pointers (Passing Two-dimensional Array to a Function), Three-dimensional Arrays, Pointers to Functions (Declaration of a Pointer to a Function, Initialization of Function Pointers, Calling a Function using a Function Pointer, Passing a Function to Another Function, How to Return a Function Pointer, Arrays of Function Pointers.	**06**
2	**Unit 2: Dynamic Memory Allocation & Advanced Pointer Programming** Dynamic Memory Allocation (Dynamic Allocation of Arrays, Freeing Memory, Reallocating Memory Blocks, Implementing Multidimensional Arrays using Pointers), Offsetting a Pointer, Memory Leak and Memory Corruption, Pointer and Const Qualifier (Pointer to Constant, Constant Pointers, Constant Parameters)	**06**
3	**Unit 3 User-defined Data Types and Variables: Structures, Unions, Enumerations, Bit-fields.** Structures (Declaring Structures and Structure Variables, Accessing the Members of a Structure, Initialization of Structures,Copying and Comparing Structures, typedef and its Use in Structure Declarations, Nesting of Structures, Arrays of Structures, Initializing Arrays of Structures, Arrays within the Structure, Structures and Pointers,	**08**

	Structures and Functions), Union (Declaring a Union and its Members, Accessing and Initializing Members of a Union, Structure Versus Union, Enumeration Types, Bitfields	
4	**Unit 4 : Files** Files in C (Using Files in C, Declaration of a File Pointer,Opening a File, Closing and Flushing Files) Working with Text Files (Character Input and Output, End of File (EOF), Detecting the End of a File using feof() Function), Working with Binary Files, Direct File Input and Output (Sequential Versus Random File Access), Files of Records (Working with Files of Records) Random Access to Files of Records, Other File Management Functions (Deleting a File, Renaming a File) Low-Level I/O	**08**
5	**Unit 5: Linked Lists** Singly Linked Lists (Insertion of a Node in a Singly Linked List, Deletion of a Node from a Singly Linked List, Sorting a Singly Linked List, Destroying a Singly Linked List, More Complex Operations on Singly Linked Lists),Circular Linked Lists (Appending a Node, Displaying a Circular Linked List, Inserting a Node after a Specified Node, Inserting a Node before a Particular Node, Deleting a Node, Sorting a Circular Linked List), Doubly Linked Lists (Operations on Doubly Linked Lists, Advantages/Disadvantages of Doubly Linked) Lists, Introduction to Circular Doubly Linked Lists, Applications of Linked Lists (Dynamic Storage Management, Garbage Collection and Compaction), Disadvantages of Linked Lists, Array versus Linked List Revisited	**08**
6	**Unit 6: Bitwise Operators & Pre-Processors** Bitwise Operator (Bitwise AND, Bitwise OR, Bitwise Exclusive-OR, Bitwise NOT, Bitwise Shift Operator), Command-line Arguments, The C Preprocessor (The C Preprocessor Directives, Predefined Identifiers), Type Qualifier (const Qualifier, volatile Qualifier, restrict Qualifier) Variable Length Argument List, Memory Models and Pointers	**04**

4. Text Book(s):

1. Programming in C, 2nd Edition, Pradip Dey, Manas Ghosh , OXFORD

5. Other Reference Books:

1. Programming in ANSI C, by Balaguru samy, Publisher - Tata McGraw Hill.
2. Programming with ANSI and Turbo C, by Ashok N Kamthane, Publisher – Pearson Education.
3. Mastering C, by Venugopal & Prasad, Publisher – Tata McGraw Hill.
4. C: The Complete Reference, by Herbert Schildt, Publisher – Tata McGraw Hill.
5. Let us C, by Yashwant Kanitkar, Publisher – BPB Publication

6. Accomplishment

After completion of the course students should become reasonably good at problem solving and algorithm development. They would become capable of solving problems using computers through C programming language.

GUJARAT TECHNOLOGICALUNIVERSITY

MASTERS IN COMPUTERAPPLICATION

Year –1(Semester–II) (W.E.F. Dec 2017)

Subject Name: Data Structures (DS)
Subject Code: 3620002

Learning Objectives:

- To develop proficiency in the specification, representation, and implementation of Data Types and Data Structures.
- To introduce the concepts of algorithmic paradigms and basic data structures and their applications.
- To implement and compare various searching and sorting techniques.
- To apply appropriate data structures to solve different problems.

Prerequisites:

- Proficiency in a programming language
- Specification and implementation of basic operations on stack, queue, tree and graph

Outcomes:

- Apply sorting and searching algorithms to small and large data sets.
- Ability to design and implement abstract data types such as linked list, stack, queue, graphs and trees.

Contents:

Unit No.	Title	Number of Lectures
I	**Introduction to Data Structure and Algorithm Analysis:** Data Structure Definition and classification, Storage Representation of Strings, Text Handling and KWIC Indexing.	4
II	**Linear Data Structures:** Arrays, Storage Structure for Arrays, Stack : List Implementation, Applications of Stacks : Function Call, Recursion, Balancing Symbols Queue: List Implementation, Circular Queue, Priority Queue, double ended queue. Linked List : Cursor Implementation, Multi List Applications of Linked List : Addition and Multiplication of Polynomial in one and two variables	8

III	**Nonlinear Data Structures:** **Graphs:** Introduction, Definition, Matrix Representation of Graphs, List Structures, Directed/Undirected Graphs, Weighted/Unweighted Graphs Path, Paths of different lengths, Cycle, Cylic Graphs, Acylic Graphs, Spanning Trees, Shortest Path. **Trees:** Introduction, Definition, Basic Tree Concepts, , Storage Representation of Binary Trees, Operations on Binary Trees, Tree Traversal, Conversion of General Tree to Binary Trees, Sequential & Other Representation of Trees, Application of Trees – The Manipulation of Arithmetic Expression, Multi-linked Structures - Sparse Matrices.	**14**
IV	**Sorting and Searching Techniques:** Introduction, Definition, Sorting – Notation and Concepts, Selection Sort, Bubble Sort, Merge Sort, Heap Sort, Quick Sort, Radix Sort, Searching - Sequential Searching, Binary Searching, Search Trees – Height Balanced, 2-3 Trees, Weight Balanced Tree, Trie Structures, Hash Table Search Methods, Hashing Functions, Collision Resolution Techniques.	**14**

Text Books:

1. "An Introduction to Data Structures with Applications", Jean-Paul Tremblay, Paul G. Sorenson, Tata McGraw-Hill, 2nd Edition, (2007)
2. "Data Structures and Algorithm Analysis in C", Second Edition, Mark Allen Weiss, Pearson Education (2002)

Chapter Wise Coverage from Text Book:

Unit No.	Text Books	Topics/Subtopics	No. of Lectures
I	Book-1	0-3.0 to 0-3.5, 2.4, 2.5.3	4
II	Book-1 Book-2	3.2, 3.5,3.6 to 3.8,4.3.1 3.3.3,3.2.7,3.2.8	8
III	Book-1	5.1.1 to 5.1.5, 5.2.1, 5.3.1, 5.4.1 to 5.4.6	14
IV	Book-1	6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.3.1, 6.2.3.2, 6.2.3.3, 6.2.3.4, 6.2.4, 6.2.4.1, 6.2.4.2, 6.2.4.3	14
		Total Number of Lectures	40

Reference Books:

1. “Introduction to Data Structures in C”, Ashok N. Kamthane, Pearson Education (2004).
2. "Introduction to Algorithm", Cormen, Leiserson, Rivest, Stein, 2nd Edition, PHI (2003).
3. “Design and Analysis of Algorithms”, Parag H Dave, Himanshu B Dave, Pearson (2014)
4. “Data Structures Using C”, Samir Kumar Bandyopadhyay, Kashi Nath Dey, Pearson Education, Year: 2004.
5. “Data Structures and Algorithms”, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Pearson Education (2002).
6. “Fundamentals of Data Structures in C”, Horowitz, Sahni, Anderson-Freed, University Press (2nd edition-2007)
7. "Data Structures and Algorithms,Concepts, Techniques and Applications", G. A.V.PAI, , TMH , 1st Edition (2008).

GUJARAT TECHNOLOGICALUNIVERSITY

MASTERS IN COMPUTERAPPLICATION

Year –1(Semester–II) (W.E.F. Dec2017)

Subject Name: Operating Systems
Subject Code: 3620003

1. **Learning Objectives:**

   This courseis intended to give studentsbasicconcepts of modern Operating Systems. This will give conceptual insight about how OS design and implementation takes place. Also, it will provide insight about interactions between user application, hardware and OS.

2. **Pre-requisites:**

   - Basic knowledge of computer hardware and software.
   - Knowledge of programming languages like C, C++ etc.

3. **Contents:**

Unit#	CourseContent	Numberof Lectures
1	**Operating System Overview & Processes** **Operating system Overview:** Operating system (OS) objectives and Functions, Evolution of OS, Major Achievements of OS, Developments Leading to Modern OS, Virtual Machines, OS design considerations for multiprocessor and multi-core **Process Description and Control:** Process, Process State, Process Description, Process Control and Execution of the OS. **Threads:** Process and Threads, Types of threads	08
2	**Concurrency Control and Deadlocks** **Concurrency: Mutual Exclusion and Synchronization:** Principles of Concurrency, Mutual Exclusion, Mutual Exclusion: Hardware Support, Semaphores, Monitors, Message Passing, Reader/Writer Problem.	12

	Concurrency: Deadlock and Starvation: Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategy, Dining Philosophers Problem	
3	**Memory** **Memory Management:** Memory Management Requirements, Memory Partitioning, Paging, Segmentation. **Virtual Memory:** Hardware and Control Structures, Virtual Memory Management	**8**
4	**Scheduling** **Uni-processor Scheduling:** Types of Scheduling, Scheduling, Algorithms, Traditional UNIX Scheduling.	**8**
5	**Input / Output and File Management** **I/O Management and Disk Scheduling:** I/O Devices, Organization of the I/O Function, OS Design Issues, I /O Buffering, Disk Scheduling, RAID, Disk cache, File management, i-node Structure.	**6**

Suggested Additional Topics for Seminar / Reading:

1) Case Study: Mobile Operating Systems (Android & iOS)
2) Trends in OS (Virtualization and Cloud)
3) VMware and Virtual Box
4) Distributed Processing, Client/Server Architecture and Clusters
5) Operating System Security

4. Main Reference Book(s):

1. StallingW, "OperatingSystems", 7th edition, PrenticeHallIndia.

5. Additional Reference Book(s):

1. Andrew S. Tanenbaum, Herbot BOS, "Modern Operating Systems", Pearson, ISBN 978-93-978-9325-7577-6
2. Silberschatz, A., Peter B.Galvin and GregGagne,"OperatingSystem Principles", Wiley-Indian Edition, 8th Ed., 2009
3. Ann McHoes,I M Flynn, "Understanding Operating Systems", 8th Edition, Cengage India Publication
4. Bach M J, "The Design of UNIX Operating System", PrenticeHallIndia, 1993.

6. Chapter wise Coverage from Main Reference Book:

Unit#	Topics
1	**Chapter1(1 to 6), Chapter2(1 to 5),Chapter3(1 & 2),**
2	**Chapter4(1 to 6),Chapter5(1 to 6)**
3	**Chapter6(1 to 4),Chapter7(1 & 2)**
4	**Chapter8(1 to 3)**
5	**Chapter10(1 to 7), Chapter 11 (1 & 2)**

GUJARAT TECHNOLOGICALUNIVERSITY

MASTERS IN COMPUTERAPPLICATION

Year –1(Semester–II) (W.E.F. Dec 2017)

Subject Name: Object-Oriented Unified Modelling
Subject Code: 3620004

Learning Objectives:

- UML is rapidly accepted throughout the software industry for modelling of software requirement and design.
- To understand what the Unified Modeling Language (UML) is, and why it is relevant to the development of software-intensive systems.
- To learn how to apply the UML.
- To learn design patterns and solve problems with the design patterns.
- Recognize and define design and enterprise integration patterns in current common use.

Prerequisites:

- There are no formal prerequisites for this course. An exposure to Object-Oriented Programming Language would be helpful, but it is not mandatory.

Outcomes:

- Student will be able to do requirements elicitation, requirements analysis, system design and document those in Unified Modeling Language (UML).

Contents:

Unit No.	Title	Number of Lectures
I	**Basics of UML** Why We Model, Introduction to UML, Classes, Relationships, Common Mechanisms, Diagrams and Class Diagrams.	10
II	**Advanced Structural Modeling** Advanced Classes, Advanced Relationships, Instances, Object Diagrams.	8
III	**Basic Behavioral Modeling** Interactions, Use Cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams.	10
IV	**Advanced Behavioral Modeling** Events and Signals, State Machines, Statechart Diagrams.	6
V	**Architectural Modeling** Components, Deployment, Component Diagrams, Deployment Diagrams.	8

Text Books:

1. "The Unified Modeling Language User Guide", Grady Booch, James Rumbaugh, Ivar Jacobson, ISBN: 9788177583724, Pearson Education

   Also Book Available online:
   https://books.google.co.in/books?id=a5J49FoFKq8C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Reference Books:

1. The Unified Modeling Language User Guide, Booch, Rumbaugh, Jacobson, Addison Wesley, 1999.
2. Object Oriented Modeling and Design, James Rumbaugh, et al, Prentice Hall, 1991.
3. Appying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process, Craig Larman, Prentice-Hall, 2000.
4. The Unified Modeling Language Reference Manual, Second Edition, Rumbaugh, Jacobson and Booch, Addison-Wesley, 2004.
5. UML Distilled: A Brief Guide to the Standard Object Modeling Language , Third Edition, Addison-Wesley Object Technology Series by Martin Fowler .
6. Learning UML 2.0, Russ Miles, Kim Hamilton, O'Reilly Media
7. Visual Modeling with Rational Rose and UML; Terry Quatrani, Addison Wesley, 1998
8. Internet material (e.g., http://www.ambysoft.com/books/agileModeling.html - Agile Modeling Effective Practices for Extreme Programming and the Unified Process)

Chapter Wise Coverage from Text Book:

Unit No.	Text Books	Topics/Subtopics	No. of Lectures
I	Book-1	Chapter 1, Chapter 2, Chapter 3, Chapter 4, Chapter 5, Chapter 6, Chapter 7 and Chapter 8.	10
II	Book-1	Chapter 9, Chapter 10, Chapter 13 and Chapter 14	8
III	Book-1	Chapter 15, Chapter 16, Chapter 17, Chapter 18 and Chapter 19.	10
IV	Book-1	Chapter 20, Chapter 21, Chapter 24	6
V	Book-1	Chapter 25, Chapter 26, Chapter 29 and Chapter 30	8
		Total Number of Lectures	42

GUJARAT TECHNOLOGICALUNIVERSITY

MASTERS IN COMPUTERAPPLICATION

Year –1(Semester–II)

Subject Name: **Software Projects - II**
Subject Code: **3620005**

Preamble

The main purpose of a software project is to enable students to apply their learning to develop software for different applications. This, in turn, will equip them to develop enough knowledge, skills and confidence to solve real-life problems, and, thereby, enhance their chances of getting good employment.
But it will be realized only when faculty members along with students put their sincere efforts. These guidelines are aimed at assisting faculty members and students to achieve the above-stated objectives.

Project Selection (Statement)

- Project statement for most of the students will be derived from the concepts either already learnt or being learnt in the current semester. However, there may be some students willing to take up projects in areas, which are out of course curriculum.

- Irrespective of the areas, from where project statements are derived, it should be ensured that the project definition is challenging. However, project scope should be time bound, measurable, and achievable.

- It is recommended that the project list is prepared by the faculty (students may choose a project outside the list based on his interest). It is also recommended that help from Industry may be sought in finding interesting industry problems.

- Project definition can be taken from either course subject, or real-life projects, or research-type of projects, or from any exciting area (e.g. Gaming, etc.)

- **It should be ensured that project definitions are not repeated.**

- **Project should not be copied from earlier batch or from downloaded from Internet. It should be own Developed.**

- It is strongly recommended that faculty guides should take ownership of the student projects being guided by them. This will help the next batch of students (or even same students) to extend and build on the previously done projects.

- The project should be able to test the student's ability to use the technology and the features of the language he/she studied during the semester even if the problem does not belong to the curriculum.

Project Execution

- Students should be better be trained and oriented to go through all stages of the software development life cycle (SDLC).
- During initial semesters, students need not follow the SDLC life cycle steps very formally. However, they should be encouraged to follow these steps even in an informal and in a preliminary manner.
- Project statement and scope should be written very clearly along with potential benefits (and the beneficiaries) right from the initial semesters.
- Students should be oriented to follow the concept of algorithmic approach right from the initial semesters.
- Coding standards should be followed meticulously. Clear justification of data structures used and approach taken is appreciated.
- Students should prepare test plan, test data and should go through testing of their software.

Project Monitoring

- Projects have a tendency to go through time overrun and cost overrun. Therefore, the project should be monitored frequently, regularly, and closely.
- Monitoring would be possible if the project plan is first prepared with clearly stated mile-stone events.
- Project activities should include SDLC life cycle stages, and the estimated time to complete a milestone activity will be prepared for each SDLC stage. Even if SDLC is not strictly followed, it is advised to record milestone events which represent critical points of the project development process.
- Monitoring would be done with respect to the project plan. Strategy and action-plan should be regularly prepared to cover any shortfall that is observed during monitoring of the project
- It is recommended that the project plan and monitoring is properly documented and the record is maintained.

Team Size: group of max 3 Person

Database: File Based i.e. Data must be stored in File.

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.

Project Evaluation

- Project evaluation will be formally done as per the examination scheme started by GTU.
- Based on periodic monitoring, internal marks will be given as per teaching scheme, based on the quality and quantity of work done at each stage of the SDLC by students.
- Each student team will be required to present the project for 10-15 minutes to external examiners. Examiners may ask for an explanation of the code and other aspects of the project. The recommended team site is 3.
- Additionally, projects can be voluntarily got evaluated by industry professionals to get a good feedback about the suitability of project definitions and utility value to industry.
- Such industry evaluations will improve the status of the students and their institutes in addition to enhancing employability of the students
- GTU External Evaluation Break-up

Best Practices : Coding Standard Followed Indentation and Comment Naming Conventions Modular Coding	25%
Code changes / Performance	60%
VIVA	15%

.

Suggested Applications

1) Library Management System
2) Banking System
3) Railway Reservation System
4) Book Store
5) Admission Registration System (ACPC)
6) Computer Based MCQ Exam System

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