विज्ञानं ब्रह्म

Bachelor of Technology

(Four Year Full Time Degree Program)

SYLLABUS

(B. Tech. First Year)

School of Computer Science and Engineering
Shri Mata Vaishno Devi University Katra

(April 2018)

ABBREVIATIONS / CODES / NOMENCLATURE	
Course Code Convention	
SCT – LSAY Example ALL 9101 ALP 9102 ALS 9110	Course Code for various Courses / Subjects SC: School Code T: Course Type Code (Lecture/Studio/Practical/Project etc.) L: Course Level (1, 2, 3, 4 & 5 for First, Second years …) SA: Study Area / Sub Area Y: Semester Wise Course Number
CSE	School Code (SoCSE)
L	Lecture
P	Practical
E	Elective
C	Colloquium
D	Project Based
T	Training
S	Self Study
N	Non Credit
V	Special Lecture Topic
Teaching Scheme Convention	
L	Lecture
T	Tutorial
P	Practical
C	Course Credit
Evaluation Scheme Convention	
Minor	(Mid Term Exams / Tests) I & II
Major	Semester End Examination (ESE)
FFCS	Fully Flexible Credit System
CBCS	Choice Based Credit System

Teaching & Examination Scheme

							Total Periods/week		Minor E Duration (Hours)	Major E Duration (Hours)	Internal Marks	Minor Marks (I +II)	Major Marks	Total Marks
B-Tech. Semester-I (Fall), First Year														
			Teaching & Credits Scheme					**Evaluation & Examination Scheme**						
S. No	Subject Code	Title of the Subject	L	T	P	S	Total Periods/week	C	Minor E Duration (Hours)	Major E Duration (Hours)	Internal Marks	Minor Marks (I +II)	Major Marks	Total Marks
1	CSL1001	Introduction to Computer Science & Engineering	1	0	0			1	1.5	3	10	40	50	100
2	PHL 1031	Engineering Physics	3	0	2			4	1.5	3	10	40	50	100
3	MTL 1012	Engineering Mathematics-I	3	0	0			3	1.5	3	10	40	50	100
4	MEL1039	Engineering Graphics with CAD	1	0	2			2	1.5	3	10	40	50	100
5	ECL 1010	Basic Electronics	3	1	2			5	1.5	3	10	40	50	100
6	LNL 1411	Communication Skills	3	0	2			4	1.5	3	10	40	50	100
7	CSL1020	Programming with 'C'(PL-1)	3	1	2			5	1.5	3	10	40	50	100
		NSS (Non-Credit)	40 Hours											

Teaching & Examination Scheme

						Total Periods/week		Minor E Duration (Hours)	Major E Duration (Hours)	Internal Marks	Minor Marks (I +II)	Major Marks	Total Marks
B-Tech. Semester–II (Winter), First Year													
			Teaching & Credits Scheme					**Evaluation & Examination Scheme**					
S No	Subject Code	Title of the Subject	L	T	P	Total Periods/week	C	Minor E Duration (Hours)	Major E Duration (Hours)	Internal Marks	Minor Marks (I +II)	Major Marks	Total Marks
1	CSL 2031	Data Structures using C	3	0	2		4	1.5	3	10	40	50	100
2	CSL 3029	Programming in Python(PL-2)	3	0	2		4	1.5	3	10	40	50	100
3	ECL 2070	Digital Electronics	3	1	2		5	1.5	3	10	40	50	100
4	MTL 1022	Engineering Mathematics – II	3	0	0		3	1.5	3	10	40	50	100
5		Environmental Studies	3	0	0		0	1.5	3	10	40	50	100
6	PCL 1067	Discourse on Human Values	3	0	0		3	1.5	3	10	40	50	100
7	MEP 1115	Workshop Practice	0	0	2		1	1.5	3	10	40	50	100

CSL 1001				Introduction to Computer Science and Engineering			Pre Requisites			
Version R-01							Co-requisites			
L	T	P	C	Minor Duration	Major Duration	Internal Marks	Minor-I Marks	Minor-II Marks	Major Marks	Total Marks
1	0	0	1							

COURSE OBJECTIVES

Computer science and engineering deals with the general problem of making precise descriptions of "things": static situations, dynamic behaviors, procedures, processes, relationships, assertions, proofs--just about anything. The languages and notations used in these descriptions are themselves objects of attention in many courses. Therefore, many course intended learning outcomes use the following terminology for skill level (least to most) to describe a student's facility in dealing with various languages and notations.

1. Reading means the student will be able to recognize a syntactically and semantically well-formed Instance of the notation, and to understand its meaning.
2. Using means the student will be able to read the notation, and will be able to apply the understanding to perform some task.
3. Writing means the student will be able to use the notation, and will be able to create new instances of it to perform some task.

COURSE CONTENTS

Unit I
Introduction to computers in society; word processing

Unit II
Application software

Unit III
The components of the system unit; spreadsheet application

Unit IV
 Operating systems and utility programs

Unit V
 Computing input devices

Unit VI
 Computing output devices

Unit VII

Storage technology, database software

Unit VIII

Database management; communications and networks

Unit IX

Computers and society, security, privacy, and ethics; presentation software

Textbooks

1. Discovering Computers 2008 (Introductory) - Shelly, Cashman, Vermaat
2. Office 2007: Brief Concepts and Techniques - Shelly, Cashman, Vermaat•

COURSE OUTCOMES

- Master understanding the role of computers in our society.
- Master using computer hardware through understanding how instructions are carried out, how data is input and information output, what the binary number system is, what kinds of storage devices are available for computers, what is meant by telecommunications.
- Master using four of the most popular kinds of software on the market: spreadsheets, database managers, presentation graphics, and word-processing.
- Be familiar with using the computer as a tool for problem solving in many areas: business, manufacturing, medicine, art, education, the military, government, etc.
- Be familiar with how computers have evolved, the history of the computer industry, and the dramatic speed at which computer technology has evolved and continues to do so.
- Be familiar with security issues, computer crime, the implications of natural disasters on computers, inadvertent tampering, and what can be done about each.
- Be exposed to social and ethical issues, including new social and ethical questions that need to be addressed because of computer technology.
- Be exposed to language issues, syntax and semantics, difficulties in using spoken languages for computers, what programming languages are, and what steps are involved in creating computer software.

CSL 1020				Programming with 'C'			Pre Requisites			
Version R-01							Co-requisites			
L	T	P	C	Minor Duration	Major Duration	Internal Marks	Minor-I Marks	Minor-II Marks	Major Marks	Total Marks
3	1	2	5	1.5 Hrs	3 Hours	10	20	20	50	100

COURSE OBJECTIVE

The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.

COURSE CONTENTS

Unit-1

Fundamentals: Introduction to C, data types, constants, variables, declarations, expression statements, arithmetic operations, unary operations, relational and logical, conditional, library functions, single character input and output, entering and writing data.

Unit-2

Control Statements and Functions**:** Statement and blocks, if else, looping, while and for, do while, switch, block and continue statements, go to and labels, nested control structures, comma operator. Functions returning non-integer, external variable, scope rules, header files, static variables, register variables, block structures, initialization, recursion, C pre processor, storage classes.

Unit-3

Arrays and Pointers**:** Definition, processing an array, passing arrays to function, multidimensional array, arrays and strings, command line arguments, pointers, pointers to function, pointers and one dimensional arrays, dynamic memory allocation, array of pointers, passing functions to other functions.

Unit-4

Structures and Unions**:** Structure basics, structures and functions, array of structures, pointers to structures, self referential structures, table lookup, typedef, unions, files, creating a data file, enumerators, bit wise operation.

Recommended Books:
1. Lets C, Y. Kanitkar, BPB
2. Programming with C, Gottafried, Schaum Series
3. C The Complete Reference, Scholdt, TMH
4. Programming with C, S. Kaicher, Macmillan
5. Programming in ANSI C, Balagurusamy, TMH
6. C For Yourself, Asian Inst. of Tech   AIT
7. Structured Programming Approach Using C, B. Forouzen, Thomas Learning

COURSE OUTCOMES

Course student will be able to:

- Identify the parts of the computer system.

- Adequately explain functioning of computer components.

- Explain the process of problem solving using computer

- Design an algorithmic solution for a given problem

- Write a maintainable C program for a given algorithm.

- Trace the given C program manually.

- Write C program for simple applications of real life using structures and files.

- Explain role of Operating system in computer system and applications of computer networks

CSL 2031				Data Structures using C			Pre Requisites			
Version R-01							Co-requisites			
L	T	P	C	Minor Duration	Major Duration	Internal Marks	Minor-I Marks	Minor-II Marks	Major Marks	Total Marks
3	0	2	4	1.5 Hrs	3Hours	10	20	20	50	100

COURSE OBJECTIVE

1. To impart the basic concepts of data structures and algorithms.
2. To understand concepts about searching and sorting techniques.
3. To Understand basic concepts about stacks, queues, lists, trees and graphs.
4. To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures.

COURSE CONTENTS

Unit 1

Introduction to programming methodologies and design of algorithms.
Structured programming concepts
Study and implementation of basic data structures like: Arrays, multidimensional arrays and their organization, introduction to sparse arrays

Unit 2

Linked list (singly, doubly and circular)

Unit 3

Stacks, Queues

Unit

Searching: Sequential and binary searching.

Unit 6

Sorting: Insertion, selection, shell, merge and quick sort

Unit 7

Introduction to trees and graphs and traversal methods.

Unit 8

Introduction to Files

List of Experiments
1. Implementation of Strings (with and without using functions)
2. Implementation of stack and its operations
3. Implementation of Q and its operations
4. Array and dynamic implementation of linked list and its operations

5. Implementation of searching and sorting techniques.

Recommended Books:

- Data structures, Lipshutiz, Shaum series
- Data structures & program design, R Kurse, PHI
- Data structures: A pseudo code approach with C, R F Gilbarg, Thomson
- An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill.
- Data Structures using C & C++ -By Ten Baum Publisher – Prenctice-Hall International.
- Fundamentals of Computer Algorithms by Horowitz, Sahni,Galgotia Pub. 2001 ed. Fundamentals of Data Structures in C++-By Sartaj Sahani.
- Data Structures: A Pseudo-code approach with C -By Gilberg & Forouzan Publisher Thomson Learning.

COURSE OUTCOMES:

- Ability to analyze algorithms and algorithm correctness.

- Ability to summarize searching and sorting techniques.

- Ability to describe stack, queue and linked list operation.

- Ability to have knowledge of tree and graphs concepts.

CSP 2031				Data Structure Lab			Pre Requisites			
Version R-01							Co-requisites			
L	T	P	C	Minor Duration	Major Duration	Internal Marks	File	Viva Voce	Major Lab Performance	Total Marks
0	0	2	1	0	3Hours		20	30	50	100

COURSE OBJECTIVES

The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures.

COURSE CONTENTS

List of Experiments

1. Strings and files in C
2. Implementation of stack and its operations
3. Implementation of Q and its operations
4. Implementation of circular Q and its operations
5. Array and dynamic implementation of linked list and its operations
6. Binary tree, implementation, creation, insertions and deletion of nodes in an existing tree

Recommended Books:

- Data structures, Lipshutiz, Shaum series
- Data structures & program design, R Kurse, PHI
- Data structures: A pseudo code approach with C, R F Gilbarg, Thomson
- An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill.
- Data Structures using C & C++ -By Ten Baum Publisher – Prenctice-Hall International.
- Fundamentals of Computer Algorithms by Horowitz, Sahni,Galgotia Pub. 2001 ed. Fundamentals of Data Structures in C++-By Sartaj Sahani.
- Data Structures: A Pseudo-code approach with C -By Gilberg & Forouzan Publisher Thomson Learning.

COURSE OUTCOMES

At the end of this lab session, the student will

- Be able to design and analyze the time and space efficiency of the data structure
- Be capable to identity the appropriate data structure for given problem
- Have practical knowledge on the applications of data structures.

CSL 3029				**Programming in Python (PL -2)**			**Pre Requisites**			
Version R-01							Co-requisites			
L	T	P	C	Minor Duration	Major Duration	Internal Marks	Minor-I Marks	Minor-II Marks	Major Marks	Total Marks
3	0	2	4	1.5 Hours	3Hours	10	20	20	50	100

Course Objective:

The learning objectives of this course are:

1. To understand why Python is a useful scripting language for developers.
2. To learn how to design and program Python applications.
3. To learn how to use lists, tuples, and dictionaries in Python programs.
4. To learn how to identify Python object types.
5. To learn how to use indexing and slicing to access data in Python programs.
6. To define the structure and components of a Python program.
7. To learn how to write loops and decision statements in Python.
8. To learn how to write functions and pass arguments in Python.
9. To learn how to build and package Python modules for reusability.
10. To learn how to read and write files in Python.
11. To learn how to design object-oriented programs with Python classes.
12. To learn how to use class inheritance in Python for reusability.
13. To learn how to use exception handling in Python applications for error handling.

Course Contents

Unit 1

Statements, expressions, variables

Understand the structure of this class, explore Python as a calculator.

Unit 2

Functions, logic, conditionals, Learn the basic constructs of Python programming, create a progam that plays a variant of Rock –Paper-Scissors.

Unit 3

Event –Driven programming, Local/global variables

Learn the basics of event driven programming, understand difference Local and global variables, create an interactive program that plays a simple guessing game.

Unit 4

Canvas, drawing, timers

Create a canvas in Python, learn how to draw on the canvas, create a digital stopwatch.

Unit 5

Lists, keyboard input, the basics of modelling motion, Learn the basics of lists in python ,model moving objects in python ,recreate the classic arcade game" Pong".

Text Book:

1. Think Python, by Allen B. Downey ,second edition ,O'Reilly, Sebastopol, California.
2. Online Version
   www.greenteapress.com/thinkpython2.pdf.

3. How to think like a computer Scientist, by Brad Miller and David Ranum.
   Online Version
   www.interactivepython.org/runstone/static/thinkscpy/index.html.

COURSE OUTCOMES

1. Implement a given algorithm as a computer program (in Python).

2. Adapt and combine standard algorithms to solve a given problem (includes numerical as well as non-numerical algorithms).

3. Adequately use standard programming constructs: repetition, selection, functions, composition, modules, aggregated data (arrays, lists, etc.).

4. Explain what a given program (in Python) does.

5. Identify and repair coding errors in a program.

6. Understand and use object based software concepts (constructing OO software will be dealt with in the course Software Engineering).

7. Use library software for (e.g.) building a graphical user interface, web application, or mathematical software.