



**SWAMINARAYAN
UNIVERSITY**
THE RESERVOIR OF ALL KNOWLEDGE

FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: ENVIRONMENT SCIENCE
(Code: AEC103-1C-D)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

1. After learning the course the students should be able to
2. Understand and realize the multi-disciplinary nature of the environment, its components, and inter-relationship between man and environment.
3. Understand the relevance and importance of the natural resources in the sustenance of life on earth and living standard.
4. Comprehend the importance of ecosystem, biodiversity and natural bio geo chemical cycle.
5. To correlate the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention.
6. Identify different types of environmental pollution and control measures.
7. To correlate the exploitation and utilization of conventional and non-conventional resources.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks			
L	T	P	T	P	Theory Marks		Practical Marks	
			2	0	E	M	I	EV
2	0	0	2		25	25	0	0
50								

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva,
EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	<p>Introduction to Environment and Environmental Studies:</p> <ul style="list-style-type: none"> Definition and Components of Environment, Relationship between the different components of Environment, Man and Environment relationship, Impact of technology on Environment, Environmental Degradation, Multidisciplinary nature of the Environment studies, its scope and importance in the present day Education System <p>Ecology and Ecosystems:</p> <ul style="list-style-type: none"> Introduction: Ecology- Objectives and Classification ,Concept of an ecosystem- structure and functions of ecosystem Components of ecosystem- Producers, Consumers, Decomposers Bio-Geo- Chemical Cycles- Hydrologic Cycle, Carbon cycle, Energy Flow in Ecosystem, Food Chains, Food webs ,Ecological Pyramids Major Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem, Estuarine Ecosystem. <p>Natural Resources:</p> <ol style="list-style-type: none"> Renewable and Nonrenewable resources, exploitation and conservation, Role of individual in conservation of natural resources. Water resources: Water sources- Surface and Ground water sources, Indian and Global scenario. Land as a resource, social issues Forest resources: Definition and Classification of Forests Ecological and Economic importance and benefits of forest, Indian scenario, Deforestation: causes and effects, remedial measures. Food resources: Sources of food, Global and Indian food demand scenario, Limits of food production, Environmental effects of Agriculture. 	12
2	<p>Human Population and Environment:</p> <ul style="list-style-type: none"> Population Growth, World and Indian scenario, Population and Environmental Degradation, Malthusian theory, Optimum theory, Population explosion – Causes, Effects and Control. Urbanization: Urban population growth and Environmental problems <p>Environmental pollution:</p> <ol style="list-style-type: none"> Types of Environmental Pollution: <ul style="list-style-type: none"> Water Pollution: Introduction – Water Quality Standards, Sources of Water Pollution: Industrial ,Agricultural, Municipal; Classification of water pollutants, Effects of water pollutants, Eutrophication Marine pollution- Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like PM, SO₂, NO_x, Natural & Anthropogenic Sources, Effects of common air pollutants Land Pollution: Land uses ,Land degradation: causes, effects and control, soil erosion Noise Pollution: Introduction, Sound and Noise, Noise 	12

	measurements, Causes and Effects e. Thermal Pollution: Causes and effects f. Role of individual in the prevention of pollution	
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***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Textbook of Environmental Studies for Undergraduate Courses	Erach Bharucha Second edition, 2013	Universities Press (India) Private Ltd, Hyderabad
2	Basics of Environmental Studies	Prof Dr N S Varandani	Academic Publishing , Germany
3	Environmental Studies	Anindita Basak	Pearson

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)



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FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: ADVANCED DATABASE MANAGEMENT SYSTEM
(Code: AMBIE107-1C)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- i. Execute various advance SQL queries related to Transaction Processing & Locking using concept of Concurrency control.
- ii. Demonstrate use of Database Object.
- iii. Perform PL/SQL programming using concept of Cursor Management, Error Handling, Package and Triggers.
- iv. Understand Functional Dependency and Functional Decomposition.
- v. Apply various Normalization techniques.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				100
L	T	P	T	P	Theory Marks		Practical Marks		
			2	2	E	M	I	EV	
2	0	4	4		25	25	25	25	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva,
EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	Advanced SQL <ul style="list-style-type: none">• Transactional Control : Commit, Save point, Rollback• DCL Commands :Grant and Revoke• Types of locks : i. Row level locks,ii. Table level locks,iii. Shared lock,iv. Exclusive lock, v. Deadlock• Synonym : Create synonym• Sequences: Create and alter sequences• Index : Unique and composite• Views : Create/Replace, Update and alter views	08
2	PL / SQL and Triggers <ul style="list-style-type: none">• Basics of PL / SQL• Datatypes• Advantages• Control Structures : Conditional, Iterative, Sequential• Exceptions: Predefined Exceptions ,User defined exceptions• Cursors: Static (Implicit & Explicit), Dynamic• Procedures & Functions• Packages : Package specification, Package body, Advantages of package• Fundamentals of Database Triggers• Creating Triggers• Types of Triggers : Before, after for each row, for each statement	12
3	Functional Dependency and Decomposition <ul style="list-style-type: none">• Basics of Functional Dependency• Functional dependency diagram and examples• Full function dependency (FFD)• Armstrong's Axioms for functional dependencies• Redundant functional dependencies• Closures of a set of functional dependencies• Lossy Decomposition• Lossless join decomposition• Dependency-Preserving Decomposition	14
4	Normalization <ul style="list-style-type: none">• Basics of Normalization• Normal Forms : i. First Normal Form (1NF),ii. Second Normal Form (2NF) ,iii. Third Normal Form (3NF) Transaction Processing <ul style="list-style-type: none">• Introduction to transaction concepts• Concurrency• Methods for Concurrency control : i. Locking Methods,ii. Timestamp methods,iii. Optimistic methods	08

*Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :AnalyzeandE :EvaluateC :Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Database Systems Concepts, design and Applications	Singh, S. K.	Pearson Education, New Delhi, 2012
2	Education, New Delhi, 2012	Bayross, Ivan	BPB
3	Sql/ Pl/SQL	Date, C. J.	Pearson Education, New Delhi, 2012
4	An Introduction to Database Systems	Korth, Henry	MGH

B. List of Major Equipment/ Software

Software: Oracle 10e/11g express edition

C. List of Software/Learning Websites

1. DBMS:<http://nptel.iitm.ac.in/video.php?subjectId=106106093>
2. SQL Plus Tutorial: <http://holowczak.com/oracle-sqlplus-tutorial/>
3. DatabaseTutorials:[http://www.roseindia.net/programming-tutorial/Database- Tutorials](http://www.roseindia.net/programming-tutorial/Database-Tutorials)
4. Notes : [http://service.felk.cvut.cz/courses/X36SQL//cviceni/plsql/pdf/](http://service.felk.cvut.cz/courses/X36SQL/cviceni/plsql/pdf/)
5. SQL Basic Concepts: <http://www.w3schools.com/sql/>
6. SQL Tutorial : <http://beginner-sql-tutorial.com/sql.htm>

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	Perform queries for DCL Commands and Locks	02
2.	Implement authorization, authentication, privileges on database.	06
3.	Perform queries to Create synonyms, sequence and index	06
4.	Perform queries to Create, alter and update views	02
5.	Implement PL/SQL programmes using control structures	02
6.	Implement PL/SQL programmes using Cursors	06

7.	Implement PL/SQL programmes using exception handling.	04
8.	Implement user defined procedures and functions using PL/SQL blocks	06
9.	Perform various operations on packages.	04
10.	Implement various triggers	04
11.	Practice on functional dependencies	04
12.	Practice on Normalization – using any database perform various normal forms.	04
13.	Practice on transaction processing	04



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COURSE CURRICULUM

Course Title: AYURVEDA AND NUTRITION
(Code: CVA103-1C-D)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

- To introduce the basic principles of nutrition in Ayurveda Pass in Class 12th
- To link the Ayurvedic nutrition with modern dietary practices for health
- To analyse basic tenets of traditional diets and health recipes
- To understand the contemporary food habits in everyday life . Awareness of traditional food cultures of India
- Evaluate changing food patterns and lifestyle over the years NIL
- Understand Indian Knowledge Systems (IKS) and key Vedic principles with respect to Food and Nutrition
- Apply basic tenets of traditional diets for health and disease
- Prepare selected healthy recipes based on Ayurvedic principles

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks			
L	T	P	T	P	Theory Marks		Practical Marks	
			2	0	E	M	I	EV
2	0	0	2		25	25	0	0
50								

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva,
EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	Introduction to Ayurvedic Nutrition <ul style="list-style-type: none">Ayurveda and Indian food culturesNutrition and lifestyle transition over the yearsRegional Food Traditions of IndiaBasic principles of Food and Nutrition and AyurvedaUnderstanding rich sources of nutrientsConcept of Doshas & assessmentAyurvedic Principles of food habits and factors determining quality of food (Ahara vidhi visheshaayatana)FSSAI regulations on Ayurvedic Aahar	12
2	Ayurvedic Diets <ul style="list-style-type: none">Principles of Diet: Aharavidhi vidhan, Sattvic, Rajasi, Tamasic foodsIncompatible food (Viruddha Ahara), Pathya; Apathya; Viprita AhaarLifestyle Management with Dinacharya and RitucharyaApplication of Ayurvedic diets to stress linked food behaviour	12

*Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Ayurvedic Science of Food and Nutrition	Rastogi S (2014)	ASIN: BOOHWMV094, Springer: ISBN-13:978-1461496274
2	Building bridges between Ayurveda and modern science	Rastogi S (2010)	Int J Ayurveda Res. 1(1):41-46.
3	FSSAI regulations on Ayurveda Aahar Regulations 2022.		Gazette of India CG-DL-E-07052022-235642. New Delhi

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)



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COURSE CURRICULUM

Course Title: COMPUTER ORGANIZATION AND ARCHITECTURE
(Code: MDC103-1C-D)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- i. Describe the organization of a computer system in terms of its main components.
- ii. Identify various parts of a system memory hierarchy.
- iii. Interface digital circuits to microprocessor systems.
- iv. Relate design principles in instruction set design including RISC architectures.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks					
L	T	P	T	P	Theory Marks		Practical Marks		100	
			3	2	E	M	I	EV		
3	0	2	4		25	25	25	25		

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EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	Computer Data Representation <ul style="list-style-type: none"> Basic computer data types, Complements, Fixed point representation, Register Transfer and Micro-operations: Floating point representation, Register Transfer language, Register Transfer, Bus and Memory Transfers (Tree-State Bus Buffers, Memory Transfer), Arithmetic 	08

	MicroOperations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logical shift unit	
2	Basic Computer Organization and Design <ul style="list-style-type: none"> • Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-output and interrupt, Complete computer description, Design of Basic computer, Design of Accumulator Unit. Assembly Language Programming <ul style="list-style-type: none"> • Introduction, Machine Language, Assembly Language Programming: Arithmetic and logic operations, looping constructs, Subroutines, I-O Programming. Micro programmed Control Organization: <ul style="list-style-type: none"> • Control Memory, Address sequencing, Micro program example, Design of Control Unit 	12
3	Central Processing Unit <ul style="list-style-type: none"> • Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, Data transfer and manipulation, Program control, Reduced Instruction Set Computer (RISC) & Complex Instruction Set Computer (CISC) 	14
4	Computer Arithmetic <ul style="list-style-type: none"> • Introduction, Addition and subtraction, Multiplication Algorithms (Booth Multiplication Algorithm), Division Algorithms, Floating Point Arithmetic operations, Decimal Arithmetic Unit. Memory Organization <ul style="list-style-type: none"> • Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory. 	14

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Computer Organization, 5 th edition,	McGraw Hill	Carl Hamacher, Zvonks Vranesic
2	Computer System Architecture	M. Moris Mano	Pearson/PHI, India:
3	Computer Architecture and Organization	John P. Hayes	Tata McGrawHill

B. List of Software/Learning Websites

<http://www.ddegjust.ac.in/studymaterial/msc-cs/ms-07.pdf> 2.

<http://www.iitg.ernet.in/asahu/cs222/Lects/3>

http://www.srmuniv.ac.in/downloads/computer_architecture.pdf

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	Implement Booth's Algorithm	02
2.	Write the working of 8085 simulator GNUsim8085 and basic architecture of 8085 along with small introduction.	06
3.	Write an assembly language code in GNUsim8085 to store numbers in reverse order in memory location	08
4.	Write an assembly language code in GNUsim8085 to implement arithmetic instruction	02
5.	Write an assembly language code in GNUsim8085 to find the factorial of a number	02
6.	Write an assembly language code in GNUsim8085 to implement logical instructions	08
7.	Design ALU using Logisim.	04
8.	To study Verilog HDL	10



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COURSE CURRICULUM

Course Title: OBJECT ORIENTED PROGRAMMING USING JAVA
(Code: OPBIM106-1C)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

Java is a general-purpose computer programming language that is a class-based, object-oriented. It is intended to let application developers "write once, run anywhere" meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. UML (Unified Modeling Language) is a modeling language used by software developers. UML can be used for modeling a system independent of a platform language. UML is a graphical language for visualizing, specifying, documenting information of software systems. UML is a standard way to write a system model that covers conceptual ideas.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		100
			2	2	E	M	I	EV	
2	0	4	4		25	25	25	25	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva,
EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	Concepts of OOP <ul style="list-style-type: none"> • Introduction OOP • Procedural Vs. Object Oriented Programming • Principles of OOP • Benefits and applications of OOP Basics of Java <ul style="list-style-type: none"> • Features of Java, Byte Code and Java Virtual Machine, JDK, Data types, Operator, Control Statements • If , else, nested if, if-else ladders, Switch, while, do-while, for, for-each, break, continue. Array and String <ul style="list-style-type: none"> • Single and Multidimensional Array, String class, StringBuffer class, Operations on string, Command line argument, Use of Wrapper Class. 	08
2	Classes, Objects and Methods <ul style="list-style-type: none"> • Class, Object, Object reference, Constructor, Constructor Overloading, Method Overloading, Recursion, Passing and Returning object form Method, new operator, this and static keyword, finalize() method, Access control, modifiers, • Nested class, • Inner class, • Anonymous inner class, • Abstract class. Inheritance and Interfaces <ul style="list-style-type: none"> • Use of Inheritance, • Inheriting Data members and Methods, constructor in inheritance, • Multilevel Inheritance method overriding • Handle multilevel constructors super keyword, • Stop Inheritance • Final keywords, • Creation and Implementation of an interface, • Interface reference, • instanceof operator, Interface inheritance, • Dynamic method dispatch , • Understanding of Java Object Class, • Comparison between Abstract Class and interface, • Understanding of System.out.println statement. 	12
3	Package: <ul style="list-style-type: none"> • Use of Package, CLASSPATH, Import statement, Static import, Access control Exception Handling : <ul style="list-style-type: none"> • Exception and Error, Use of try, catch, throw, throws and finally, Built in Exception, Custom exception, Throwable Class. Multithreaded Programming: <ul style="list-style-type: none"> • Use of Multithread programming, Thread class and Runnable interface , Thread priority, Thread synchronization, Thread communication, Deadlock IO Programming: <ul style="list-style-type: none"> • Introduction to Stream, Byte Stream, Character stream, Readers and Writers, File Class, File InputStream, File 	14

	Output Stream, InputStreamReader, OutputStreamWriter, FileReader, FileWriter, Buffered Reader	
4	Collection Classes: <ul style="list-style-type: none"> List, ArrayList, LinkedList, Enumeration, Vector, Properties, Introduction to Java.util package Networking with java.net : <ul style="list-style-type: none"> InetAddress class, Socket class, DatagramSocket class, DatagramPacket class Introduction to Object orientation, Modeling as a Design Technique Modeling Concepts ,abstraction, The three models, Class Model, State model and Interaction model. Class Modeling : Object and class concepts, link and association, Generalization and Inheritance Advanced class Modeling : Advanced Object and class concepts, Association Ends, N-ary associations, aggregation, abstract classes, multiple inheritance, Metadata, Constraints, Derived data, Packages. State modeling : Events, states, Transition and conditions, state diagram, state diagram behavior Interaction Modeling Use case Models, sequence models, activity models 	08

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Java Fundamentals A comprehensive introduction	Herbert Schildt, Dale Skrien	TMH
2	Programming with Java A Primer	Balaguruswami,E.	TMH
3	The Complete Reference	Herbert Schild	TMH
4	Core Java Volume-I Fundamentals	Horstmann & Cornell	Pearson Education
5	Object Oriented Modeling and Design with UML	Michael Blaha and James Rumbaugh	Pearson Education

B. List of Major Equipment/ Software

1. JDK,JRE

C. List of Software/Learning Websites

1. <http://www.oracle.com/technetwork/java/javase/downloads/index.html>
2. <http://www.javatpoint.com/>
3. <http://www.tutorialspoint.com/java/>

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	Write a program to convert rupees to dollar. 60 rupees=1 dollar.	02
2.	A. Write a program that calculate percentage marks of the student if marks of 6 subjects are given. B. Write a program to enter two numbers and perform mathematical operations on them. C. Write a program to find length of string and print second half of the string.	06
3.	A. Write a program to accept a line and check how many consonants and vowels are there in line. B. Write a program to count the number of words that start with capital letters. C. Write a program to find that given number or string is palindrome or not. D. Create a class which ask the user to enter a sentence, and it should display count of each vowel type in the sentence. The program should continue till user enters a word "quit". Display the total count of each vowel for all sentences.	08
4.	Write an interactive program to print a string entered in a pyramid form. For instance, the string "stream" has to be displayed as follows: <div style="text-align: center;"> S S t S t r S t r e S t r e a S t r e a m </div>	02
5.	Write an interactive program to print a diamond shape. For example, if user enters the number 3, the diamond will be as follows: <div style="text-align: center;"> * * * * * * * * * </div>	02
6.	A. Create a class called Student. Write a student manager	

	<p>program to manipulate the student information from files by using FileInputStream and FileOutputStream</p> <p>B. Refine the student manager program to manipulate the student information from files by using the BufferedReader and BufferedWriter</p> <p>C. Refine the student manager program to manipulate the student information from files by using the DataInputStream and DataOutputStream. Assume suitable data</p>	08
7.	<p>A. Prepare a class diagram for given group of classes using multiplicity, generalization, association concepts. And add at least 5-7 attributes and 3-5 operations for particular class Page, Shape, Point, Line, Arc, Ellipse, Rectangle, Circle</p> <p>B. Prepare a class diagram for given group of classes using multiplicity, generalization, association concepts. And add at least 5-7 attributes and 3-5 operations for particular class. City, Airport, Airline, Pilot, Flight, Plane, Seat, Passenger</p>	04
8.	<p>Categorize the following relationships into generalization, aggregation or association.</p> <p>[A] A country has a capital city</p> <p>[B] A dining philosopher uses a fork</p> <p>[C] A file is an ordinary file or a directory file</p> <p>[D] Files contains records</p> <p>[E] A polygon is composed of an ordered set of points</p> <p>[F] A drawing object is text, a geometrical object, or a group</p> <p>[G] A person uses a computer language on a object</p> <p>[H] Modems and keyboards are input/output devices</p> <p>[I] Classes may have several attributes</p> <p>[J] A person plays for a team in a certain year</p> <p>[K] A route connects two cities</p> <p>[L] A student takes a course from a professor</p>	10
9.	<p>A. Prepare a state diagram for an interactive diagram editor for selecting and dragging objects</p> <p>B. Prepare a use case diagram and sequence diagram for a computer email system</p>	04
10.	<p>A. Prepare an activity diagram for computing a restaurant bill, there should be charge for each delivered item. The total amount should be subject to tax and service charge of 18% for group of six and more. For smaller groups there should be a blank entry. Any coupons or gift certificates submitted by the customer should be subtracted</p> <p>B. Prepare a sequence diagram for issuing a book in the library management system</p>	04



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COURSE CURRICULUM

Course Title: PYTHON PROGRAMMING
(Code: PPBIM105-1C)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

On the completion of the course students will:

1. To recognize why python is extensively used by developers in the industry.
2. To study and employ different datatypes, operators, I/O and control statements.
3. To define & implement class and different levels of inheritance.
4. To learn creating modules and data structures like List, Tuples and Dictionaries
5. To handle exceptions and work with the built in standard libraries.
6. To create a virtual environment.
7. To implement python database connectivity.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		100
			2	2	E	M	I	EV	
2	0	4	4		25	25	25	25	

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	Beginning with Python, Datatypes, Operators, I/O and Control statements Introduction to Python Python, Features of Python, Viewing of Byte Code, Flavours of Python, PVM, Memory Management in Python, Garbage collection in python, Comparisons between C-Java-Python, Writing first Python program, Execution of a Python program (using command line, IDLE window and system prompt). Datatypes in Python Built-in datatypes, None types, Numeric types, Explicit conversion of datatypes, Sequences in Python, str, bytes, bytearray, List, Tuple, range, Sets, set datatype, frozenset, mapping types, Determining the datatype of a variable, Identifiers and reserved words, Naming conventions in Python. Operators, I/O and control statements Membership operators, Identity operators, Output statements, Input statements, Command line arguments, A word on Indentation, The if-elif-else statement, Infinite loops, Nested Loops, The else Suite, break, continue, pass, assert and return statements.	08
2	Modules, Arrays, Functions, List, Tuples and Dictionaries Modules, Arrays and Functions Creating our own modules in python, Advantages of Array, Creating an Array, Importing the array module, Indexing- Slicing and Processing the arrays, Difference between a function and a method, Defining-calling and returning(single and multiple) results from a function, Pass by Object Reference, Positional arguments, Keyword arguments, Default arguments, Variable length arguments, Anonymous Functions, Function Decorators. List and Tuples Exploring List, Creating lists using range() function, Updating the elements of the list, Concatenation of two lists, Repetition of lists, Membership in lists, Aliasing and Cloning lists, Methods to process List, Nested Lists, Tuples, Creating and accessing Tuple elements, Basic operations on Tuples, Functions to process tuples, Nested Tuples and its sorting. Dictionaries Introduction to Dictionaries, Operations on Dictionaries, Dictionary methods, Converting List into Dictionary, Passing dictionaries to functions.	12
3	Classes, Inheritance and Polymorphism Classes Creating a class, The Self variable, Constructor, Types of variables, Types of methods, Passing members of one class to another. Inheritance Implementing inheritance, Constructors in inheritance, Overriding Super class constructors and methods, The super() method, Types of Inheritance, Single and multiple, problems in multiple inheritance, Method resolution order(MRO).	14

	Polymorphism Introduction to polymorphism, Duck Typing Philosophy of Python, Operator overloading, method overloading, method overriding.	
4	Exception Handling, Standard Library, Creating Virtual Environment and Python Database connectivity Exception Handling and Standard Library Exceptions, Exception handling, Types of exceptions, Operating System Interface, File wildcards, Command line arguments, String pattern matching, mathematics, internet access, dates and times, data compression, performance measurement. Creating virtual environment Introduction, generating virtual environments, managing packages with pip(Python Package Index). Python and MySQL Installing MySQL Connector, Verifying the Connector Installation, Using MySQL from Python, Retrieving all rows from a table, Inserting rows into a table, Deleting rows from	08

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Core Python Programming	By, Dr. R. Nageswara Rao,	2017 edition

B. List of Major Equipment/ Software

- Python 3.4.1 or higher
- IDE: IDLE
- Database: MySQL

C. List of Software/Learning Websites

1. <https://www.python.org/about/apps/>
2. <https://www.w3schools.com/python/default.asp>
3. <https://www.tutorialspoint.com/python3/index.htm>
4. <https://www.programiz.com/python-programming/tutorial>

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	Write a program to swap two numbers without taking a temporary variable.	02
2.	Write a program to display sum of two complex numbers.	02
3.	Write a program to create a byte type array, read, modify, and display the elements of the array	02
4.	Create a sequence of numbers using range datatype to display 1 to 30, with an increment of 2.	02
5.	Write a program to find out and display the common and the non common elements in the list using membership operators	02
6.	Create a program to display memory locations of two variables using id() function, and then use identity operators to compare whether two objects are same or not.	02
7.	Write a program that evaluates an expression given by the user at run time using eval() function. Example: <i>Enter and expression: 10+8-9*2-(10*2)</i> <i>Result: -20</i>	02
8.	Write a python program to find the sum of even numbers using command line arguments.	02
9.	Write a menu driven python program which perform the following: Find area of circle Find area of triangle Find area of square and rectangle Find Simple Interest Exit.(Hint: Use infinite while loop for Menu)	02
10.	Write a program to assert the user enters a number greater than zero.	02
11.	Write a program to create one array from another array.	02
12.	Create a program to retrieve, display and update only a range of elements from an array using indexing and slicing in arrays.	02
13.	Write a program to understand various methods of array class mentioned: append, insert, remove, pop, index, tolist and count.	02
14.	Write a program to sort the array elements using bubble sort technique.	02
15.	Create a program to search the position of an element in an array using index() method of array class.	02
16.	Write a program to create a Student class with name, age and marks as data members. Also create a method named display() to view the student details. Create an object to Student class and call the method using the object.	02
17.	Write a program to create Student class with a constructor having more than one parameter.	02
18.	Write a program to demonstrate the use of instance and class/static variables.	02
19.	Write a program to store data into instances using mutator	02

	methods and to retrieve data from the instances using accessor methods.	
20.	Write a program to use class method to handle the common features of all the instance of Student class.	02
21.	Write a program to handle some built in exceptions like <i>ZeroDivisionError</i> .	02
22.	Write a program to handle multiple exceptions like <i>SyntaxError</i> and <i>TypeError</i>	02
23.	Write a program to import “os” module and to print the current working directory and returns a list of all module Functions	02
24.	Write a program to provide a function for making file lists from directory wildcard searches.	02
25.	Write a program to import <i>datetime</i> module and format the date as required. Also use the same module to calculate the difference between your birthday and today in days.	02



**SWAMINARAYAN
UNIVERSITY**
THE RESERVOIR OF ALL KNOWLEDGE

FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: OFFICE AUTOMATION & IT TOOLS
(Code: SEC103-1C-D)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Science In Information Technology-(B.Sc.IT)	Third Semester

Course Objectives –

This course gives a practical introduction to the DOS and WINDOWS operating system .It makes the students proficient in the use of MS OFFICE packages namely WORD, EXCEL & POWER POINT

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks			
L	T	P	T	P	Theory Marks		Practical Marks	
0	0	4	0	2	E	M	I	EV
0	0	4	2	0	0	25	25	50

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva,
EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	MICROSOFT WORD <ul style="list-style-type: none"> Creating a New Office Document Creating a Document Using a Wizard or Template Entering Text Turning on Paragraph marks on Opening and Editing Documents Finding and Replacing Text 	12

	<ul style="list-style-type: none"> • Using Print Layout View, Outline View, Web Layout View • Making Documents Look Great • Changing Font, Font Size, Boldfacing, Italicizing, Underlying, Expanding and Condensing Character spacing, Changing the Case of Text, Using special Font Effects • Selecting Paragraphs, Using the ruler to Indent Paragraphs, Setting a Different First Line Indent, Indent Using paragraph Dialog Box, Double Spacing Paragraphs, Centering and Justifying Paragraphs, Setting tabs, Adding Bullets to Paragraphs, Setting Tabs, Adding bullets to Paragraphs, Numbering Paragraphs • Finding And Replacing Formatting, Using Style, Choosing Text Style, Creating a Paragraph style, Modifying a paragraph Style, Creating a character style • Changing the Page size and Orientation, Changing Margins, Setting up Headers and Footers, Creating Multiple Sections, Paginating the Document, Numbering Pages, Setting up Multiple Columns, Auto Formatting a Document • Creating A tables, Drawing a table, Entering, Aligning, Totaling Data in a Table, Turning on Borders and Shading, Converting Text to Table and vice a versa 	
2	MICROSOFT EXCEL <ul style="list-style-type: none"> • Creating New Workbooks and Worksheets • Moving within a sheet, Entering, Editing Cells, Filling an Entry Range, Auto filling a range, Entering a Simple Calculations, Building a Simple Formula, Summing Columns and Rows, Sum Function, Copying Formulas, Average Functions, Function Wizard • Enlarging Columns and Rows, Inserting Rows and Columns, Inserting and Deleting Cells, Moving & Copying Data, Freezing the Headings • Building a Better Worksheet • Enlarging Columns and Rows, Inserting Rows and Columns, Inserting and Deleting Cells, Moving & Copying Data, Freezing the Headings • Making Your Worksheet Look Great • Choosing an AutoFormat, Formatting Text, Centering a Title Above a Range, Formatting numbers, Adding Borders & Shading to Range, Applying Conditional Formatting • From Numbers to Pictures: All About Charts • Creating a Default Chart, Creating a Chart using Chart Wizard, Modifying: Chart, Chart Type, Chart Area, Plot Area, Gridlines, Titles, Axes, Legend, a Data Series • Adding data to a chart, adding data Tables and Trend lines • Extra Special Excel Tricks • Changing to Another Sheet, Naming Sheets, Referring to Data • From Other Sheets in Formulas, Consolidating to a Sheet, Naming Ranges, Auditing a Workbook, Seeking Goals, Tracking Changes, Reviewing Changes, Inserting Comments, Protecting and Sharing a workbook, merging workbooks 	12

	<ul style="list-style-type: none"> • Making a Bill in Excel MICROSOFT POWERPOINT <ul style="list-style-type: none"> • Creating New Presentation • Using Auto content Wizard, Using a Design Template, Using Sample Presentation, Changing Views, Adding Slides • Outlining the Presentation • Creating Text Slides • Making Great Looking Presentation • Selecting new design, Changing Color Scheme, Switching to Slide and Title Master Views, Changing the Background color and shading, Text Fonts, Header and Footer Information, Adding logo to Background, Reordering Slides, Duplicating and deleting Slides. 2.2.2 Drawing shapes, lines, Adding Predefined shapes and Text boxes, Adding Shadows and 3-D Effects, Making text conform to shapes, Grouping and Ungrouping Shapes, Rearranging and Rotating Shapes • Showtime ! Presenting on Paper, In Person and on the Wave • Adding Transition Effects, Adding Preset Animation, Creating Custom Animations, setting up the show, Displaying the Show • Making on Organization Structure in Power Point • Starting an organization chart, Entering names and Titles, Adding Members, Formatting the Boxes, Text and Lines, Rearranging the Org Chart, Finishing the Chart 	
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***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Microsoft Office for windows ('O' Level DOEACC)	Sagman Pub	Pearson Education ISBN 81-7808-341-8
2	World Wide Web Design with HTML	C. Xavier	TMH
3	Mastering MS OFFICE - 2000 COURTERTECHMEDIA Professional addition	Herbert Schild	-

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	Understand	Apply	Analyze	Evaluate	Create
07	07	11	-	-	-

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
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2.	<ul style="list-style-type: none"> • Selecting Paragraphs, Using the ruler to Indent Paragraphs, Setting a Different First Line Indent, Indent Using paragraph Dialog Box, Double Spacing Paragraphs, Centering and Justifying Paragraphs, Setting tabs, Adding Bullets to Paragraphs, Setting Tabs, Adding bullets to Paragraphs, Numbering Paragraphs. • Finding And Replacing Formatting, Using Style, Choosing Text Style, Creating a Paragraph style, Modifying a paragraph Style, Creating a character style. • Changing the Page size and Orientation, Changing Margins, Setting up Headers and Footers, Creating Multiple Sections, Paginating the Document, Numbering Pages, Setting up Multiple Columns, Auto Formatting a Document. • Creating A tables, Drawing a table, Entering, Aligning, Totaling Data in a Table, Turning on Borders and Shading, Converting Text to Table and vice a versa 	08
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	<p>AutoFormat, Formatting Text, Centering a Title Above a Range, Formatting numbers, Adding Borders & Shading to Range, Applying Conditional Formatting</p> <ul style="list-style-type: none"> • From Numbers to Pictures: All About Charts Creating a Default Chart, Creating a Chart using Chart Wizard, Modifying: Chart, Chart Type, Chart Area, Plot Area, Gridlines, Titles, Axes, Legend, a Data Series • Adding data to a chart, adding data Tables and Trend lines • Extra Special Excel Tricks Changing to Another Sheet, Naming Sheets, Referring to Data From Other Sheets in Formulas, Consolidating to a Sheet, Naming Ranges, Auditing a Workbook, Seeking Goals, Tracking Changes, Reviewing Changes, Inserting Comments, Protecting and Sharing a workbook, merging workbooks • Making a Bill in Excel 	
4.	<ul style="list-style-type: none"> • Creating New Presentation • Using Auto content Wizard, Using a Design Template, Using Sample Presentation, Changing Views, Adding Slides • Outlining the Presentation Creating Text Slides Making Great Looking Presentation Selecting new design, Changing Color Scheme, Switching to Slide and Title Master Views, Changing the Background color and shading, Text Fonts, Header and Footer Information, Adding logo to Background, Reordering Slides, Duplicating and deleting Slides. • Drawing shapes, lines, Adding Predefined shapes and Text boxes, Adding Shadows and 3-D Effects, Making text conform to shapes, Grouping and Ungrouping Shapes, Rearranging and Rotating Shapes • Show time Presenting on Paper, In Person and on the Wave Adding Transition Effects, Adding Preset Animation, Creating Custom Animations, setting up the show, Displaying the Show • Making on Organization Structure in Power Point • Starting an organization chart, Entering names and Titles, Adding Members, Formatting the Boxes, Text and Lines, Rearranging the Org Chart, Finishing the Chart 	14
