JAI HIND COLLEGE
BASANTSING INSTITUTE OF SCIENCE
&
J.T.LALVANI COLLEGE OF COMMERCE
(AUTONOMOUS)
"A" Road, Churchgate, Mumbai - 400 020, India.

Affiliated to
University of Mumbai

Syllabus for F.Y.BSc

Course: Information Technology

Semester: II

Credit Based Semester and Grading System (CBCS) with effect from the academic year 2021-22

F.Y.BSc. IT

Academic year 2021-2022

Semester II			
Course Code	**Course Title**	**Credits**	**Lectures /Week**
SBIT201	Python Programming	2	5
SBIT202	Advanced Web Programming	2	5
SBIT203	Microprocessor and Embedded System	2	5
SBIT204	Computer Network	2	5
SBIT205	Green Computing	2	5
SBIT201 PR	Python Programming Practical	2	3
SBIT202 PR	Advanced Web Programming Practical	2	3
SBIT203 PR	Microprocessor and Embedded System Practical	2	3
SBIT204 PR	Computer Network Practical	2	3
SBIT205 PR	Green Computing Practical	2	3

Semester II – Theory

Course: SBIT201	Course Title: Python Programming (Credits : 02 Lectures/Week: 05)	
	Objectives: ➢ **Improved programming skills** ➢ **Read, understand and trace the execution of programs written in Python** ➢ **To be familiar about the basic constructs of programming such as functions, Strings, Tuples, Lists, Sets and Dictionaries etc.** ➢ **To understand how to read/write to files, handle exceptions and multi-threading using python.** ➢ **To build and package Python modules for reusability.** ➢ **To understand the concept of pattern matching.** ➢ **To understand the advanced concepts of GUI controls and designing GUI applications along with database connectivity to move the data to/from the application.** **Outcomes:** ➢ **Interpret Object oriented programming in Python** ➢ **Understand and summarize different File handling operations** ➢ **Be able to design GUI Applications in Python and evaluate different database operations**	
Unit I	**Introduction to Python:** The Python Programming Language, History, Features, Installing Python, Running Python program, Interactive Mode and Script Mode, The Difference Between Brackets, Braces and Parentheses **Variables and Expressions in Python:** Values and Types, Variables, Variable Names and Keywords, Type conversion, Operators and Operands, Expressions, Order of Operations, input and output function in python, Comments **Conditional Statements and loops in python:** if, if-else, nested if –else, For loop, while loop, nested loops **Control statements in python:** Terminating loops, skipping specific conditions	**15 L**
Unit II	**Functions:** Function Calls, Type Conversion Functions, Math Functions, lambda functions, composition, Adding New Functions, Definitions and Uses, Parameters and Arguments, Fruitful Functions and Void Functions, Boolean Functions, Recursion, Checking Types. **Strings:** String Slices, Strings Are Immutable, Searching, Looping and Counting. String Methods, the in Operator, String Comparison, String Operations. **Lists:** Values and Accessing Elements, Lists are mutable, traversing a List, Deleting elements from List, Built-in List Operators, Built-in List functions and methods. **Tuples:** Tuples, Accessing values in Tuples, Basic tuples operations, Built-in tuple functions.	**15 L**

	Sets and Dictionaries: Sets, sets are mutable, set methods, set operations and frozenset. Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Built-in Dictionary Methods.	
Unit III	**Files:** Text Files, The File Object Attributes, Directories, Format attribute. **Exceptions:** Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions. **Regular Expressions:** Concept of regular expression, various types of regular expressions, using match function, search, findall methods. **Multithreaded Programming:** Thread Module, creating a thread, synchronizing threads **Modules:** Importing module, Creating and exploring modules, Math module, Random module, Time module.	**15 L**
Unit IV	**Creating the GUI form: (using Tkinter/wxPython/PyQt)** **Widgets-** Button, Canvas, Checkbutton, Entry, Frame, Label, Listbox, Menubutton, Menu, Radiobutton, Scale, Scrollbar, Text. ,Spinbox, PanedWindow, LabelFrame, tkMessagebox. Handling Standard attributes and Properties of Widgets. **Layout Management-** Designing GUI applications with proper Layout Management features. **Storing Data in Our MySQL Database via Our GUI:** Connecting to a MySQL database from Python, Configuring the MySQL connection. Designing the Python GUI database. Using the INSERT command, using the UPDATE command, using the DELETE command. Storing and retrieving data from MySQL database. **Web Frameworks: Django :**Introduction, Web frameworks, Introduction to Django, Projects and Apps, "Hello World" Application.	**15 L**

Textbook:

1. Think Python - 2nd Edition by Allen Downey
2. An Introduction to Computer Science using Python 3- 2nd Edition by Jason Montojo, Jennifer Campbell, Paul Gries
3. Python GUI Programming Cookbook - 2nd Edition by Burkhard A. Meier
4. Exploring Python - by Timothy A. Budd
5. Core Python Applications Programming - 3rd Edition by Wesley J.Chun
6. https://docs.python.org/3/tutorial

Evaluation Scheme

[A] Evaluation scheme for Theory courses
I. Continuous Assessment (C.A.) - 40 Marks
(i) C.A.-I : Test – 20 Marks of 40 mins. duration
(ii) C.A.-II :Mini Project- 20 Marks

II. Semester End Examination (SEE)- 60 Marks

Course: SBIT202	Course Title: Advanced Web Programming (Credits : 02 Lectures/Week: 05)	
	Objectives: ➢ **Understanding emerging web technologies** ➢ **Learn the basics of creating XML documents, transforming XML documents, and validating XML documents** ➢ **Articulate what React is and why it is useful** ➢ **Understand creating large web applications** ➢ **Creating dynamic web applications** ➢ **Creating progressive web applications** ➢ **Use React components to build interactive interfaces** ➢ **Build interactive user interfaces** **Outcomes:** ➢ **Understand how the client-server model of Internet programming works.** ➢ **Design and develop interactive, client-side, executable web applications.** ➢ **Build tools that assist in automating data transfer over the Internet.**	
Unit I	**XML:** **Introducing XML:** The Benefits of XML, How XML Works. **XML Fundamentals Contents:** XML Documents and XML Files Elements, Tags, and Character Data Attributes, XML Names Entity References, CDATA Sections Comments Processing Instructions, The XML Declaration Checking Documents for Well-Formedness. **Namespaces:** The Need for Namespaces, Namespace Syntax, How Parsers Handle Namespaces **React:** Introduction,What is React ,What is single page application(SPA),React Installation,React ES6,React JSX,First React Code ,Creating a React Project ,Setting Up a Code Editor	**15 L**
Unit II	**React:** How React Works & Understanding Components ,React Class,More About Components & Styling with CSS Classes ,Handling Events ,Introducing State,Event Props,Stateless and Stateful Components,Adding Routing,Adding Links & Navigation,CSS Modules ,Outputting Lists ,Adding More Components,Props Children,Dom Management with React,Adding a Form ,Getting User Input & Handling Form Submission,Preparing the App for HTTP,Sending a Post Request, Navigating Programmatically,Getting Started with Fetching Data ,React Hooks: useEffect ,Introducing React Context,Context Logic & Different Ways of Updating State, Using Context in Components	**15 L**
Unit III	**Introduction of Laravel PHP Framework:** Installing Laravel, Artisan CLI (command-line interface), Laravel Directory Structure, Configuring a new Laravel project, Basic routing, Call a controller method from a route, Passing variables from controllers to views	**15 L**

	HTML Template to Laravel Blade Template: Template inheritance Blade conditional statements, Blade Loops, Executing PHP functions in blade Displaying Your Views, Creating and using basic views, Loading a view into another view/nested views, Adding assets, Integrating with Bootstrap, Creating contact us form, Validating user input.	
Unit IV	Migrations: Introduction, Requirements for running migrations, Artisan migration command, Migration structure, How to create a table using a migration, Laravel migration rollback, Database Seeding. Eloquent ORM: Eloquent ORM Models, Naming conventions, Table name and primary keys, Eloquent ORM INSERT, READ, UPDATE, DELETE Flask : Installation, Basic application structure,Templates, webforms, Databases	15 L

Textbook:

1. XML in a Nutshell, 3rd Edition, Elliotte Rusty Harold, W. Scott Means, O'Reilly Media, Inc.
2."React in Action"-by Mark Tielens Thomas,Manning publications
3. Laravel_ Up & Running_ A Framework for Building Modern PHP Apps, 2nd Edition, Matt Stauffer, O'Reilly.
4. Introduction to Flask by Miguel Grinberg

Evaluation Scheme

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I. Continuous Assessment (C.A.) - 40 Marks
(i) C.A.-I : Test – 20 Marks of 40 mins. duration
(ii) C.A.-II :Mini Project- 20 Marks

II. Semester End Examination (SEE)- 60 Marks

Course: SBIT203	Course Title: Microprocessor and Embedded Systems (Credits : 02 Lectures/Week: 05)	

	Objectives:
	
	➢ To understand basic architecture of 8086 microprocessor and 8051 microcontroller.
	➢ To understand interfacing of 8086 microprocessor with memory and
	    o peripheral chips involving system design.
	➢ To understand techniques for faster execution of instructions and
	    o improve speed of operation and performance of microprocessor.
	➢ To provide in-depth knowledge about embedded processor, its hardware.
	➢ To explain programming concepts and embedded programming in C.
	
	Outcomes:
	➢ Understand the hardware and software components as well as their development cycles.
	➢ Understand the deployment of embedded processors and supporting devices.
	➢ 8051 programming in C designing of embedded system with 8051.
	➢ To apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes	

Unit I	**8086 microprocessor architecture, pin diagrams and timing diagrams** Register organisation of 8086, Architecture, SIgnal descriptions of 8086, Physical memory organisation, general bus operation, I/O addressing capability, special processor activities, minimum mode 8086 system and timings, maximum mode 8086 system and timings	**15 L**
Unit II	**Instruction Set and Assembly Language Programming of 8086:** Machine language instruction formats, addressing modes of 8086, instruction set, assembler directives and operators, few machine level programs, assembly language example programs, interrupt cycle of 8086, maskable and non-maskable interrupt	**15 L**
Unit III	**Introduction:** Embedded Systems and general purpose computer systems, history, classifications, applications and purpose of embedded systems Core of embedded systems: microprocessors and microcontrollers, RISC and CISC controllers, Big endian and Little endian processors, Application specific ICs, Programmable logic devices, COTS, sensors and actuators, communication interface, embedded firmware, other system components. **Characteristics and quality attributes of embedded systems:** Characteristics, operational and non-operational quality attributes. **Embedded Systems – Application and Domain Specific:** Application	**15 L**

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	specific – washing machine, domain specific - automotive. **Designing Embedded System with 8051 Microcontroller:** Factors to be considered in selecting a controller, why 8051 Microcontroller, Designing with 8051.	
Unit IV	**The 8051 Microcontrollers**: Microcontrollers and Embedded processors, Overview of 8051 family. 8051 Microcontroller hardware, Input/output pins, Ports, and Circuits, External Memory. **Programming embedded systems:** structure of embedded program, infinite loop, compiling, linking and debugging. **8051 Programming in C:** Data Types and time delay in 8051 C, I/O Programming, Logic operations, Data conversion Programs. **Real Time Operating System (RTOS):** types of operating systems, Real-Time Characteristics, Selection Process of an RTOS. **Design and Development:** embedded product development life-cycle, trends in embedded Industry. **Research:** Home Automation, Fuzzy logics , Security systems.	**15 L**

Textbook:

TEXT BOOKS:
1. D. V. Hall. Micro processors and Interfacing, TMGH. 2'1 edition 2006.
2. Kenneth. J. Ayala. The 8051 microcontroller , 3rd edition, Cengage learning, 2010
3. Shibu K V. (2012). Introduction to embedded systems: TataMcgraw-Hill.
4. Rajkamal. Embedded Systems: TataMcgraw-Hill.
5. Muhammad Ali Mazidi. (2011). The 8051 Microcontroller and Embedded Systems: Pearson.
6. Advanced Microprocessors and Peripherals - A. K. Ray and K.M. Bhurchandi, TMH, 2nd edition 2006.

REFERENCE BOOKS:
1. The 8051 Microcontrollers, Architecture and programming and Applications -K.Uma Rao, Andhe Pallavi,,Pearson, 2009.
2. Microcomputer System 8086/8088 Family Architecture. Programming and Design - By Liu and GA Gibson, PHI, 2nd Ed.,
3. Microcontrollers and application, Ajay. V. Deshmukh, TMGH. 2005

Evaluation Scheme

[A] Evaluation scheme for Theory courses
I. Continuous Assessment (C.A.) - 40 Marks
  (i) C.A.-I : Test – 20 Marks of 40 mins. duration
  (ii) C.A.-II :Mini Project- 20 Marks

II. Semester End Examination (SEE)- 60 Marks

Course: SBIT204	Course Title: Computer Networks (Credits : 02 Lectures/Week:05)	
	Objectives: ➢ This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. ➢ Build an understanding of the fundamental concepts of computer networking. ➢ Understand and building the skills of subnetting and routing mechanisms. ➢ Familiarize the student with the basic taxonomy and terminology of the computer networking area. ➢ Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking. **Outcomes:** ➢ This course will prepare students in Basic networking concepts. ➢ Understand and explain the Data Communications System and its components. ➢ Understand different types of networks, various topologies and application of networks. ➢ Understand types of addresses, data communication. ➢ Have an understanding of the issues surrounding Mobile and Wireless Networks. ➢ Understand the concept of networking models, protocols, functionality of each layer. ➢ Learn basic networking hardware and tools. ➢ Identify the different types of network topologies and protocols. ➢ Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer	
Unit I	**INTRODUCTION to Networks and the Physical Layer** **USES OF COMPUTER NETWORKS**: Business Applications, Home Applications, Mobile Users, Social Issues **NETWORK HARDWARE:** Personal Area Networks, Local Area Networks, Metropolitan Area Networks, Wide Area Networks, Internetworks **NETWORK SOFTWARE**: Protocol Hierarchies Design Issues for the Layers, Connection-Oriented Versus Connectionless, ServiceService Primitives, The Relationship of Services to Protocols **REFERENCE MODELS:**The OSI Reference Model, The TCP/IP Reference Model, A Comparison of the OSI and TCP/IP Reference Models **EXAMPLE NETWORKS**:The Internet, Third-Generation Mobile Phone Networks,Wireless LANs: 802.1, RFID and Sensor Networks NETWORK STANDARDIZATION THE PHYSICAL LAYER THE THEORETICAL BASIS FOR DATA COMMUNICATION Fourier Analysis, Bandwidth-Limited Signals, The Maximum Data Rate of a Channel	**15 L**

	GUIDED TRANSMISSION MEDIA:Magnetic Media, Twisted Pairs, Coaxial Cable, Power Lines, Fiber Optics	
Unit II	**THE PHYSICAL LAYER** **WIRELESS TRANSMISSION:** The Electromagnetic Spectrum, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Transmission **COMMUNICATION SATELLITES**: Geostationary Satellites, Medium-Earth Orbit Satellites, Low-Earth Orbit Satellites **DIGITAL MODULATION AND MULTIPLEXING**: Baseband Transmission, Passband Transmission, Frequency Division Multiplexing, Time Division Multiplexing, Code Division Multiplexing **THE PUBLIC SWITCHED TELEPHONE NETWORK**: Structure of the Telephone System, The Local Loop: Modems, ADSL, and Fiber. Trunks and Multiplexing, Switching **THE MOBILE TELEPHONE SYSTEM:** First-Generation (1G) Mobile Phones: Analog Voice, Second-Generation (2G) Mobile Phones: Digital Voice, Third-Generation (3G) Mobile Phones: Digital Voice and Data	**15 L**
Unit III	**Data Link Layer** Introduction to DataLink Layer, Introduction Link Layer Addressing **Error Detection and Correction:** Introduction, Block Coding, Cyclic codes, CheckSum, Data Link Control(DLC), DLC Services, DataLink Layer Protocols, HDLC, PPP **MAC:** Random Access, Controlled Access, Channelization **Wired Lans**: Ethernet, Ethernet Protocol, Standard Ethernet, Fast Ethernet , Gigabit Ethernet, 10 Gigabit Ethernet **Wireless LANs**: Introduction, IEEE 802.11 PROJECT, Bluetooth, Wimax, Virtual Lans, RFID,Learning Bridges ,Spanning Tree Bridges Introduction to Network Layer- Network Layer services,Packet Switching,IPV4 Addresses, Forwarding of IP Packets Network Layer Protocols-Internet Protocol(IP),ICMPv4,Mobile IP Unicast Routing- Introduction,Routing Algorithms,Unicast Routing Protocols, Next Gen IP-IPV6 Addressing,The IPv6 Protocol,The ICMPv6 Protocol,Transition from IPv4 to IPv6, Tunneling	**15 L**
Unit IV	**THE TRANSPORT SERVICE**: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley Sockets **ELEMENTS OF TRANSPORT PROTOCOLS:** Addressing, . Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery **CONGESTION CONTROL ALGORITHMS**: Desirable Bandwidth Allocation, Regulating the Sending Rate, Wireless Issues **THE INTERNET TRANSPORT PROTOCOLS:** UDP-Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol **THE INTERNET TRANSPORT PROTOCOLS**: TCP- Introduction to TCP , The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release **THE APPLICATION LAYER**: DNS-THE DOMAIN NAME SYSTEM ELECTRONIC MAIL, Architecture and Services, The User Agent,	**15 L**

	Message Formats, Message Transfer, Final Delivery, THE WORLD WIDE WEB, REALTIME AUDIO AND VIDEO, Quality Of service and VOIP, CONTENT DELIVERY AND PEER-TO-PEER	

Textbook:
1. Computer Networks Andrew, Tanenbaum Pearson Fifth 2013
2. Data Communication and Networking, Behrouz A. Forouzan Tata McGraw Hill Fifth Edition 2013
3. Data and Computer Communications, William Stallings Pearson Eight edition

Evaluation Scheme

[A] Evaluation scheme for Theory courses

  I.   **Continuous Assessment (C.A.) - 40 Marks**
      (i)   **C.A.-I: Test – 20 Marks of 40 mins. duration**
      (ii)   **C.A.-II: Mini Project - 20 Marks**

  II.   **Semester End Examination (SEE)- 60 Marks**

Course: SBIT205	Course Title: Green Computing (Credits : 02 Lectures/Week: 05)	
	Objectives: ➢ **Innovative way to converge technology and ecology.** ➢ **Security Concerns & Social Problems** ➢ **Practice of efficient and eco-friendly computing resources** **Outcomes:** ➢ **Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.** ➢ **Enhance the skill in energy saving practices in their use of hardware.** ➢ **Evaluate technology tools that can reduce paper waste and carbon footprint.** ➢ **Understand the ways to minimize equipment disposal requirements.**	
Unit I	**Overview and Issues:** Problems: Toxins, Power Consumption, Equipment Disposal, Company's Carbon Footprint: Measuring, Details, reasons to bother, Plan for the Future Cost Savings: Hardware, Power. **Initiatives and Standards:** Global Initiatives: United Nations, Basel Action Network, Basel Convention, North America: The United States, Canada, Australia, Europe, WEEE Directive, RoHS, National Adoption Asia: Japan, China, Korea. **Case Study:** Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector.	**15 L**
Unit II	**Minimizing Power Usage:** Power Problems, Monitoring Power Usage Servers, Low-Cost Options, Reducing Power Use, Data De-Duplication, Virtualization, Management, Bigger Drives, Involving the Utility Company, Low Power Computers, PCs, Linux, Components, Servers, Computer Settings, Storage, Monitors, Power Supplies, Wireless Devices, Software. **Cooling:** Cooling Costs, Power Cost, Causes of Cost, Calculating Cooling Needs, Reducing Cooling Costs, Economizers, On-Demand Cooling, HP's Solution, Optimizing Airflow, Hot Aisle/Cold Aisle, Raised Floors, Cable Management, Vapour Seal, Prevent Recirculation of Equipment Exhaust, Supply Air Directly to Heat Sources, Fans, Humidity, Adding Cooling, Fluid Considerations, System Design, Datacentre Design, Centralized Control, Design for Your Needs, Put Everything Together. **Datacenter Design and Redesign:** Energy Consumption Design Upgrading Servers, Server consolidation, Virtualization. **Changing the Way of Work:** Old Behaviours, starting at the Top Process Reengineering with Green in Mind Analysing the Global Impact of Local Actions Steps: Water, Recycling, Energy, Pollutants, Teleworkers and Outsourcing, Telecommuting, Outsourcing, how to Outsource, Artificial photosynthesis **Case Study:** The Environmentally Responsible Business Strategies (ERBS)	**15 L**
	Going Paperless: Paper Problems, The Environment, Costs: Paper and Office, Practicality, Storage, Destruction, Organizational Realities,	**15 L**

Unit III	Changing Over, Paperless Billing, Handheld Computers vs. the Clipboard, Unified Communications, Intranets, What to Include, Building an Intranet, Microsoft Office SharePoint Server 2007, Electronic Data Interchange (EDI), Nuts and Bolts, Value Added Networks, Advantages, Obstacles. **Recycling:** Problems, China, Africa, Materials, Means of Disposal Recycling, Refurbishing, Make the Decision Life Cycle, from beginning to end, Life, Cost, Green Design, Recycling Companies, Finding the Best One, Checklist, Certifications. Hard Drive Recycling: Consequences, cleaning a Hard Drive, Pros and cons of each method, CDs and DVDs, good and bad about CD and DVDs disposal, Change the mind-set, David vs. America Online. **Hardware Considerations:** Certification Programs, EPEAT, RoHS, Energy Star, Computers, Monitors, Printers, Scanners, All-in-Ones, Thin Clients, Servers, Blade Servers, Consolidation, Products, Hardware considerations, Planned Obsolescence, Packaging, Toxins, Other Factors. Remote Desktop, Using Remote Desktop, Establishing a Connection, In Practice. **Case Study:** Case Study Scenarios for Trial Run	
Unit IV	**Greening Your Information Systems:** Initial Improvement Calculations, Selecting Metrics, Tracking Progress, Change Business Processes, Customer Interaction, Paper Reduction, Green Supply Chain, Improve Technology Infrastructure, Reduce PCs and Servers, Shared Services, Hardware Costs, Cooling. **Staying Green:** Organizational Check-ups, Chief Green Officer, Evolution, Sell the CEO, SMART Goals, Equipment Check-ups, Gather Data, Tracking the data, Baseline Data, Benchmarking, Analyse Data, Conduct Audits, Certifications, Benefits, Realities, Helpful Organizations. **Case Study:** Green alternatives for future	**15 L**

Textbook:

1. Toby Velte, Anthony Velte, Robert Elsenpeter (2008). Green IT: Reduce Your Information System's Environmental Impact McGraw Hill
2. Harnessing Green IT Principles and Practices , San Murugesan, G.R. Gangadharan Wiley Publication

Additional References:
1. Alvin Galea, Michael Schaefer, Mike Ebbers.(2011) Green Data Center: Steps for the Journey. Shroff Publishers and Distributers
2. **Bud E. Smith. (2014). Green Computing Tools and Techniques for Saving Energy, Money and Resources CRCPress**

Evaluation Scheme

[A] Evaluation scheme for Theory courses
I. Continuous Assessment (C.A.) - 40 Marks
(i) C.A.-I : Test – 20 Marks of 40 mins. duration
(ii) C.A.-II : Case Study/Presentation- 20 Marks
II. Semester End Examination (SEE)- 60Mark

Semester II – Practical

Course: SBIT201PR	Practical Title:Python Programming Practical(Credits : 02 Practicals/Week: 03)

	1.Implement the following in Python:
	a. Write a program to display the message HELLO WORLD.
	b. Write a program to swap two numbers without using a third variable.
	c. Write a program to find the area of rectangle, square and circle.
	2.Implement the following in Conditional and Control Statements.
	a. Write a program to enter a number from the user and display the month name. If number >13 then display invalid input using switch case.
	b. Write a program to check whether the number is even or odd.
	c. Write a program to find the factorial of a number.
	d. Write a program to check whether the entered number is prime or not.
	e. Write a program to find the largest of three numbers.
	
	3.Implement the following in Functions and Lists
	a. Write a function to check the input value is Armstrong and also write the function for Palindrome.
	b. Write a recursive function to print the factorial for a given number.
	c. Take a list, say for example this one: a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89] and write a program that prints out all the elements of the list that are less than 5.
	d. Write a program that takes two lists and returns True if they have at least one common member.
	e. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and 5th elements.
	f. Define a procedure histogram () that takes a list of integers and prints a histogram to the screen. For example, histogram ([4, 9, 7]) should print the following:
	        ****
	        *********
	        *******
	
	4.Implement the following in Strings, Tuples and Dictionaries
	a. Demonstrate all the methods of string and tuples.
	b. Write a Python script to sort (ascending and descending) a dictionary by value.
	c. Write a Python script to concatenate the following dictionaries to create a new one. Sample Dictionary :
	        dic1={1:10, 2:20}
	        dic2={3:30, 4:40}
	        dic3={5:50,6:60}
	        Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
	d. Write a Python program to sum all the items in a dictionary.

5.Concepts of Regular Expression and File Handling

a.   Program to demonstrate the use of regular expressions.
b.   Write a Python program to read an entire text file.
c.   Write a Python program to append text to a file and display the text.
d.   Write a Python program to read the last n lines of a file.

6.Exceptions and Multithreading

a.   Write a program to handle any five python exceptions.
b.   Write a Python program to illustrate user defined exceptions.
c.   Write a program for producer consumer problems to illustrate multithreading in python.

7.Modules

a.   Open a new file in IDLE ("New Window" in the "File" menu) and save it as geometry.py in the directory where you keep the files you create for this course. Then copy the functions you wrote for calculating volumes and areas in the "Control Flow and Functions" exercise into this file and save it. Now open a new file and save it in the same directory. You should now be able to import your own module like this:import geometry Try and add print dir(geometry) to the file and run it.Now write a function pointyShapeVolume(x, y, squareBase) that calculates the volume of a square pyramid if squareBase is True and of a right circular cone if squareBase is False. x is the length of an edge on a square if squareBase is True and the radius of a circle when squareBase is False. y is the height of the object.First use squareBase to distinguish the cases. Use the circleArea and squareArea from the geometry module to calculate the base areas.
b.   Write a python program to demonstrate a random module.
c.   Write a python program to demonstrate different methods of time module.

 8.**GUI Programming**

a.   Try to configure the widget with various options like: bg= "red", family= "times", size=18
b.   Try to change the widget type and configuration options to experiment with other widget types like Message, Button, Entry, Checkbutton, Radiobutton, Scale etc.

9.Database Programming with GUI

a.   Design a simple database application that stores the records and retrieves the same.
b.   Design a database application to search the specified record from the database.
c.   Design a database application that allows the user to delete and modify the records.

10.Web Framework: Django

a.   Demonstrate simple web application using Python Django framework.

Evaluation Scheme

[B] Evaluation scheme for Practical courses-50 Marks

Course: SBIT202PR	Practical Title: Advanced Web Programming Practical (Credits : 02 Practicals/Week: 03)
	XML: 1. a) Design a simple XML document b) Design a XML document and display it in browser using CSS. **React:** 2. Creating an application using react. (Component,State and Props) 3. Demonstrating React JSX, React Router. 4. Demonstrate Form handling using React-Login form, Registration form,Working with Event Listeners. **Laravel:** 5. Installing Laravel and also understands the directory structure. 6. Create an application to perform routing with different routing methods and also pass parameters as a route parameter. 7. Create a form to implement Blade template. 8. Create a laravel application and connect it with mysql database to perform insert, update, search and delete operations. **Flask:** 9. a) create Flask Application b) Show the use of cookies and sessions c) Connect Flask to a Database with Flask-SQLAlchemy

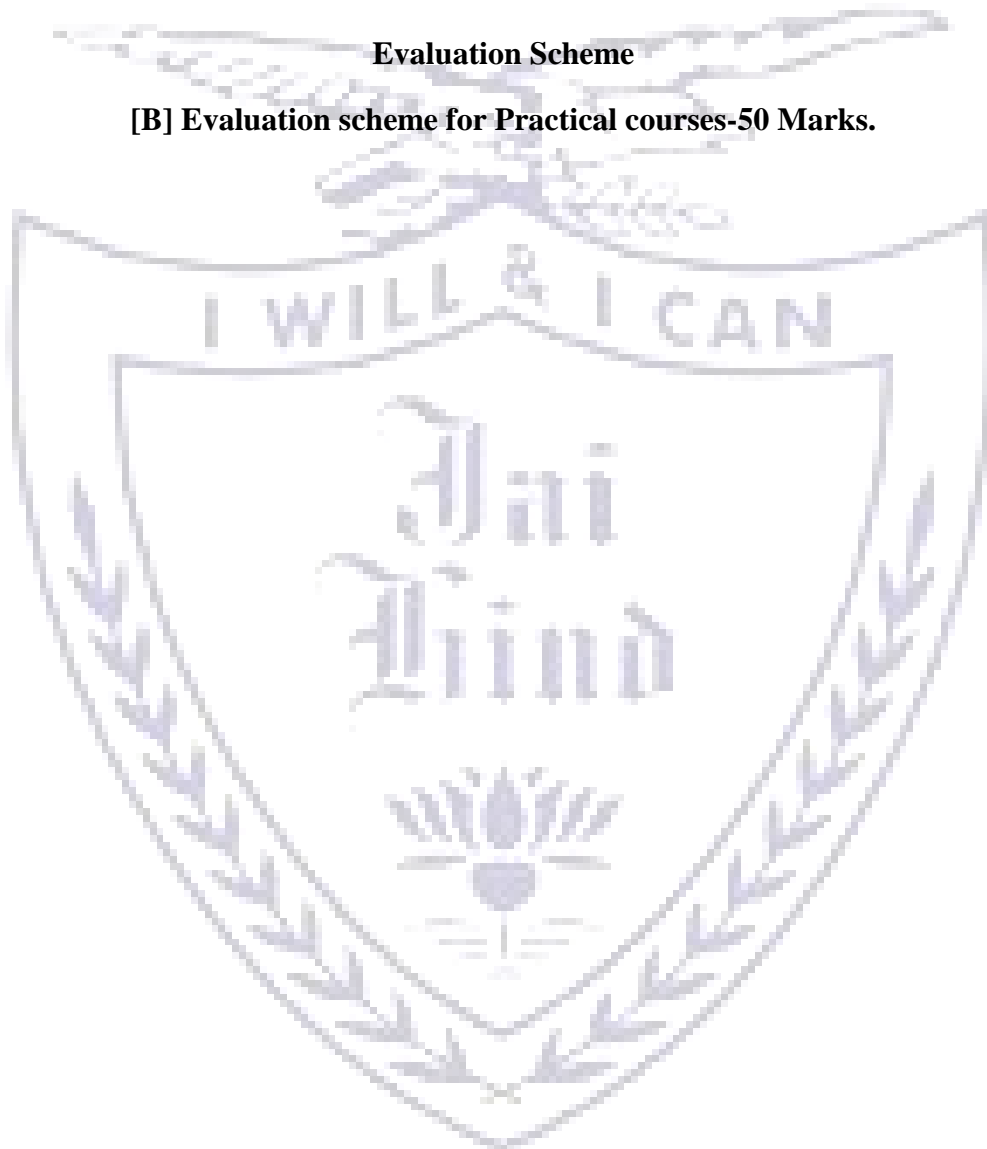| Course: SBIT203PR	Practical Title: Microprocessor and Embedded Systems Practical (Credits : 02Practicals/Week: 03)
	1. Programs Involving Data transfer instructions a) Write an ALP to move block of data without overlap b) Write an ALP to move block of data with overlap 2. Programs Involving Arithmetic & logical operations a) Write an ALP to add 2 Multibyte no b) Write an ALP to divide two numbers c) Write an ALP to convert binary to BCD 3. Programs Involving Branch/Loop instructions a) Write an ALP to find largest no. from the given array b) Write an ALP to find smallest no from the given array 4. Programs Involving String manipulation a) Write an ALP to transfer of a string in forward direction b) Write an ALP to reverse string 5. Programs Involving Searching for a string a) Write an ALP to search a character in a string b) Write an ALP to given string is palindrome or not 6. Design and develop a reprogrammable embedded computer using 8051 microcontrollers and to show the following aspects. a) Programming b) Execution c) Debugging 7.a) Configure timer control registers of 8051 and develop a program to generate a given time delay. b) To demonstrate use of general purpose port i.e. Input/ output port of two controllers for data transfer between them. c) Port I / O: Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's 8.a) Serial I / O: Configure 8051 serial port for asynchronous serial communication with serial port of PC exchange text messages to PC and display on PC screen. Signify end of message by carriage return. b) To demonstrate interfacing of a seven-segment LED display and generate counting from 0 to 99 with fixed time delay. c) Interface 8051 with D/A converter and generate square wave of given frequency on oscilloscope. d) Interface stepper motor with 8051 and write a program to move the motor through a given angle in clockwise or counterclockwise direction. 9. Implement Temperature controller.

	10. Implement Elevator control 11. Using Flash Magic a) To demonstrate the procedure for flash programming for reprogrammable embedded system board using Flash Magic b) To demonstrate the procedure and connections for multiple controllers programming the same type of controller with the same source code in one go, using flash magic

Evaluation Scheme

[B] Evaluation scheme for Practical courses-50 Marks.

Course: SBIT204PR	Practical Title: Computer Networks Practical (Credits : 02 Practicals /Week: 03)

	1. IPv4 Addressing and Subnetting
	a)Given an IP address and network mask, determine other information about the IP address such as:
	    • Network address
	    • Network broadcast address
	    • Total number of host bits
	    • Number of hosts
	b)Given an IP address and network mask, determine other information about the IP address such as:
	    • The subnet address of this subnet
	    • The broadcast address of this subnet
	    • The range of host addresses for this subnet
	    • The maximum number of subnets for this subnet mask
	    • The number of hosts for each subnet
	    • The number of subnet bits
	    • The number of this subnet
	2.Use of ping and tracert / traceroute, ipconfig / ifconfig, route and arp utilities
	3. Configure IP static routing.
	4. Configure IP routing using RIP.
	5.Configuring Simple OSPF
	6. Configuring DHCP and DNS server and client
	7. Create a virtual PC based network using virtualization software and virtual NIC.
	8. a. Configuring OSPF with multiple areas b. Configuring BGP
	9. Use of Wireshark to scan and check the packet information of following protocols
	    • HTTP
	    • ICMP
	    • TCP
	    • SMTP
	    • POP3
	10. Configuring FTP,SSH and TELNET.

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Course: SBIT205PR	Practical Title:Green Computing Practical (Credits : 02 Practicals /Week: 03)

	Phase 1
	   a. Case study on components on environment and environmental engineering.
	   b. Study of environmental safety awareness and disaster management
	   c. Using Latex for documentation (lab session)
	Phase 2
	   a. Carbon Footprint report and calculation
	   b. Activity: E-waste collection drive and survey for the project topic
	
	Phase 3
	   Report writing and study of different directives associated with the project.
	
	Phase 4
	   a. Calculating metrics, measurements, energy ratings associated with the project.
	   b. Group Discussion and assessment of project outcome

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