ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering with Specialization in AI Powered Mobile Applications - Apple Authorized Training Center) Choice Based Credit System (CBCS)-2025-29

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSH107	BS	Linear Algebra	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES

The student will have ability to:

1. Know the fundamental principles of the Linear algebra.
2. Understand and apply the basics of the Matrices and Vector Space.

COURSE OUTCOMES

After the successful completion of this course students will be able to:

1. Apply the techniques to find the Solution of Linear equations.
2. Apply the basics of the calculus of the Determinants.
3. Apply the basics of the calculus of theMatrices.
4. Apply the concept of Singular value decomposition and Principal component analysis in Image Processing and Machine Learning.

SYLLABUS

UNIT I

Introduction to Matrices and Determinants; Solution of Linear Equations; Cramer's rule; Inverse of a Matrix.

UNIT II

Vectors and linear combinations; Rank of a matrix; Gaussian elimination; LU Decomposition; Solving Systems of Linear Equations using the tools of Matrices.

UNIT III

Vector space; Dimension; Basis; Orthogonality; Projections; Gram-Schmidt orthogonalization and QR decomposition

UNIT IV

Eigenvalues and Eigenvectors; Positive definite matrices; Linear transformations; Hermitian and unitary matrices;

UNIT V

Singular value decomposition and Principal component analysis; Introduction to their applications in

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering with Specialization in AI Powered Mobile Applications - Apple Authorized Training Center) Choice Based Credit System (CBCS)-2025-29

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSH107	BS	Linear Algebra	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Image Processing and Machine Learning.

TEXT BOOKS:

1. Higher Engineering Mathematics, B. S. Grewal.

REFERENCES:

1. Advanced Engineering Mathematics, 7th Edition, Peter V. O'Neil.
2. Advanced Engineering Mathematics, 2nd Edition, Michael. D. Greenberg.
3. Introduction to linear algebra, 5th Edition, Gilbert Strang.
4. Applied Mathematics (Vol. I & II) , by P. N. Wartikar& J. N. Wartikar.
5. Digital Image Processing, R C Gonzalez and R E Woods
6. https://machinelearningmastery.com/introduction-matrices-machine-learning .

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering with Specialization in AI Powered Mobile Applications - Apple Authorized Training Center) Choice Based Credit System (CBCS)-2025-29

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSH107	BS	Linear Algebra	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	The objective of this Course is to provide the new ways of creative thinking and Learn the innovation cycle of Design Thinking process for developing innovative products which useful for a student in preparing for an engineering career.
COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	The students will be able to Compare and classify the various learning styles and memory techniques and apply them in their engineering education
2.	Analyze emotional experience and Inspect emotional expressions to better understand users while designing innovative products
3.	Develop new ways of creative thinking and Learn the innovation cycle of Design Thinking process for developing innovative products
4.	Propose real-time innovative engineering product designs and Choose appropriate frameworks, strategies, techniques during prototype development
5.	Perceive individual differences and its impact on everyday decisions and further create a better customer experience

SYLLABUS

UNIT I	**10 HOURS**

An Insight to Learning: Understanding the Learning Process, Kolb's Learning Styles, Assessing and Interpreting. Remembering Memory- Understanding the Memory process, Problems in retention, Memory enhancement techniques.

UNIT II	**9 HOURS**

Emotions: Experience & Expression **Understanding Emotions:** Experience & Expression, Assessing Empathy, and Application with Peers. Basics of Design Thinking- Definition of Design Thinking, Need for Design Thinking, Objective of Design Thinking, Concepts & Brainstorming, Stages of Design Thinking Process (explain with examples) – Empathize, Define, Ideate, Prototype, Test.

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS102M	BEC	Introduction to Design Thinking	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III	**8 HOURS**
Being Ingenious & Fixing Problem: Understanding Creative thinking process, Understanding Problem Solving, Testing CreativeProblem Solving.Process of Product Design- Process of Engineering Product Design, Design Thinking Approach, Stages of Product Design, Examples of best product designs and functions, Assignment – Engineering Product Design.	
UNIT IV	**7 HOURS**
Prototyping & Testing: What is Prototype? Why Prototype? Rapid Prototype Development process, Testing, SampleExample, Test Group Marketing. Celebrating the Difference- Understanding Individual differences & Uniqueness, Group Discussion and Activities to encourage the understanding, acceptance and appreciation of Individual differences.	
UNIT V	**8 HOURS**
Design Thinking & Customer Centricity: Practical Examples of Customer Challenges, Use of Design Thinking to Enhance Customer Experience, Parameters of Product experience, Alignment of Customer Expectations with Product Design. Feedback, Re-Design & Re-Create- Feedback loop, Focus on User Experience, Address "ergonomic challenges, User focused design, rapid prototyping & testing, final product, Final Presentation – "Solving Practical Engineering Problem through Innovative Product Design & Creative Solution".	
TEXTBOOKS:	
1.	E Balaguruswamy (2022), Developing Thinking Skills (The way to Success), Khanna BookPublishing y. Company
LIST OF PRACTICALS	
1.	Write a Love/Breakup Letter relating to any product covering its positive & negative features, strength, and fix, enhance and rethink.
2.	Write the Design Thinking Steps i.e.. Empathize, Define the problem, Ideate, Prototype and Test relating to the product you choose.

Chairperson
Board of Studies,
ShriVaishnavVidyapeeth
Vishwavidyalaya, Indore

Chairperson
Faculty of Studies,
ShriVaishnavVidyapeeth
Vishwavidyalaya, Indore

Controller of Examination
ShriVaishnavVidyapeeth
Vishwavidyalaya, Indore

Registrar
ShriVaishnavVidyapeeth
Vishwavidyalaya, Indore

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS102M	**BEC**	**Introduction to Design Thinking**	**60**	**20**	**20**	**30**	**20**	**2**	**0**	**2**	**3**

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

3.	Understand a real-world problem and try solving it through an Empathy Map
4.	Write a persona of any celebrity or personal
5.	Understand the way advertisement makes use of storytelling. Pick a particular advertisement and make a presentation on it, covering - character, plot, conflict, climax, resolution
6.	Develop a collage using four/five pictures, do storyboarding based on the collage.
7.	Develop a low-level prototype like Paper Prototype
8.	Find a problem statement and perform testing on it using certain testing technique.
9.	Demonstrate a project using design thinking process.
10.	Demonstrate the tools and techniques used in design thinking

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS102M	BEC	Introduction to Design Thinking	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	Use of Boolean algebra and Karnaugh Map to simplify logic function
2.	Describe the operation of different Combinational and Sequential Logic Circuits

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Design an optimal digital logic circuit to meet the given specifications.
2.	Evaluate the performance of the given digital logic circuit based on specific criteria for reliable system implementation

SYLLABUS

UNIT I	
Number System: Introduction to number systems: Decimal, Binary, Octal and Hexadecimal, Base Conversion. Signed Binary Numbers: Signed magnitude, 1's Complement and 2's Complement representation and their arithmetic operations, 32-bit Floating point representation, Codes: Types of code, Binary code, BCD, Gray code, Excess-3. BCD Addition, Code Conversion, Error Detecting and Correcting code: Even and Odd Parity, Hamming code.	
UNIT II	
Boolean algebra and Logic gates: Introduction to logic gates, Boolean Laws, De-morgan's theorem, Consensus theorem, Implementation using logic gates, Simplification of Boolean Expression using Boolean Laws, Canonical and Standard (SOP and POS) forms. Universal gates, NAND-NOR implementation of logic functions. Karnaugh Maps (K-maps), Minimization of logic functions using K-map. Don't Care Conditions.	
UNIT III	
Combinational circuits: Arithmetic circuits- Half adder, Full adder, Half subtractor, Full subtractor, Parallel Adder, BCD adder, Multiplexer, De-multiplexer, Encoder and Decoder. Design of Combinational circuits using Multiplexer and Decoder.	
UNIT IV	**8 HOURS**

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEC104	BEC	Digital Logic & Circuit Design	60	20	20	30	20	3	1	2	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Sequential Circuits: Introduction, Asynchronous and Synchronous Sequential circuits, Latches and Flip Flops: SR, D, JK and T. Characteristic equation, Characteristic and Excitation table. Master-Slave Flip-flop, Race around conditions, Flip flop conversion.

UNIT V

Applications of Flip-flop: Shift Register: SISO, SIPO, PISO, PIPO, Left and Right Shift Register, Bidirectional Shift Register. Counter: Ring counter, Johnson Counter, Asynchronous Up/down counter, Synchronous Up/down counters: State diagram, state table and realization, Mod-N Counter.

TEXTBOOKS:

1.	M. Morris Mano,"Digital Logic and Computer Design", Pearson Education, 2016
2.	S Salivahanan and S Arivazhagan: Digital Circuits and Design,4th Edition, VikasPublishing House, 2012

REFERENCE:

1.	Anand Kumar, "Fundamentals of Digital Circuits", 4th Edition, PHI,2016.
2.	Floyd and Jain,"Digital Fundamentals", 10th Edition, Pearson Education India,2011
3.	Roland J.Tocci,Widmer,Moss, "Digital Systems Principles and Applications", 10th Edition, Pearson 2009
4.	Stephen Brown, ZvankoVranesic, "Fundamentals of Digital Logic Design", 3rd Edition, McGraw Hill, 2017

LIST OF PRACTICALS

1.	To study the operation of various logic gates and verify their truth tables
2.	To verify De Morgan's theorem
3.	To verify the versatility of NAND and NOR gates.
4.	To compare and verify standard SOP/POS expression with minimized Boolean form using K-map.
5.	To design and verify Adder and subtract or circuits.
6.	To design and verify multiplexer and DE multiplexer using basic logic gates.
7.	To realize 4-bit parallel adder circuit.
8.	To design and verify encoder and decoder circuits using ICs
9.	To verify the truth table of different flip flops
10.	To verify the functionality of shift register.
11	To verify the functionality of counter circuit.

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS202M	DCC	Object Oriented Programming with C++	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	To explain abstract data types, classes and different types of objects
2.	To analyze the public, protected and private modes of inheriting the classes
3.	To demonstrate the overloading of functions and operators to grant them a different meaning.
4.	To provide complete knowledge of Object Oriented Programming through C++ and to enhance the programming skills of the students by giving practical assignments to be done in labs.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Identify and describe the components of object-oriented technology and justify their relevance.
2.	Implement inheritance for code reusability and polymorphism.
3.	Implement object oriented approach for real world scenarios.
4.	Use advance features like temples and exception to make programs supporting reusability and sophistication
5.	Develop the applications using object oriented programming with C++.

SYLLABUS

UNIT I	**10 HOURS**
Concepts of OOP: Introduction OOP, Procedural vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP. C++ Basic Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures.	
UNIT II	**9 HOURS**
C++ Functions: The Main Function, Function prototyping, Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments.	
UNIT III	**8 HOURS**
Objects and Classes: Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, friend function. Inheritance: Concept of Inheritance, types of inheritance, access modifiers, overriding, virtual base class.	
UNIT IV	**7 HOURS**
Polymorphism: Polymorphism and its types, Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism, Abstract Methods and Classes.	

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS202M	DCC	Object Oriented Programming with C++	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Exception Handling, Templates function and class in C++

UNIT V **8 HOURS**

I/O and File management: Concept of Streams, Cin and Cout Objects, C++ Stream Classes, Unformatted and Formatted I/O, Manipulators, File Stream, C++ File Stream Classes, File Management Functions, File Modes, Binary and Random Files.

TEXTBOOKS:

1. David Parsons; Object oriented programming with C++; Second edition; BPB publication; 1997
2. Robert Lafore; Object oriented programming in C++ ; Fourth edition ; Pearson publication;2002
3. E Balagurusamy; Object oriented programming with C++; Seven edition; TMH; 2017
4. Herbert Schildt ; Java Complete Reference;Seven edition; McGrawHill; 2006

REFERENCE:

1. John R Hubbard; Programming in C++ (Schaum); Third edition; TMH; 2000
2. Venugopal; Mastering C++ ; second edition ;TMH; 2006
3. Steven Holzner; C++ Programming Black Book; First Edition; Coriolis Group,U.S;2001.
4. E Balagurusamy; Programming with java a primer; Fourth edition; TMH ; 2011

LIST OF PRACTICALS

1. Write a program to display the following output using a single cout statement. Maths=90, Physics=74, Chemistry=76
2. Write a program to read 2 numbers from the keyboard and display the larger value on the screen
3. Write a function using reference variables as arguments to swap the values of a pair of integers
4. Write a macro that obtains the largest of 3 numbers
5. 1. Define a class to represent a bank account. Include the following members:
   Data members
   1. Name of the depositor
   2. Account number
   3. Type of account
   4. Balance amount in the account

   Member functions
   1. To assign initial values
   2. To deposit an amount
   3. To withdraw an amount after checking the balance

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS202M	DCC	Object Oriented Programming with C++	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

	4. To display name and balance Write a main program to test the program.
6.	Create two classes DM and DB which store the value of distances. DM stores distances in meters and centimeters and DB in feet and inches. Write a program that can read values for the class objects and odd one object of DM with another object of DB Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object, depending on the units in which the result are required. The display should be in the format of feet and inches or meters and centimeters depending on the object on display
7.	Design a constructor for bank account class.
8.	A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required. If the requested copies book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise the message "Required copies not in stock" is displayed.Design a system using a class called books with suitable member functions and Constructors. Use new operator in constructors to allocate memory space required
9.	Improve the system design in exercise 8 to incorporate the following features: (a) The price of the books should be updated as and when required. Use a private member function to implement this. (b) The stock value of each book should be automatically updated as soon as a transaction is completed. (c) The number of successful transactions should be recorded for the purpose of statistical analysis. Use static data members to keep count of transaction.
10.	Design a C++ Class 'Complex' with data members for real and imaginary part. Provide default and parameterized constructors. Write a program to perform arithmetic operations of two complex numbers using operator overloading (using either member functions or friend functions).
11.	Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class account that stores customer name, account number and type of account. From this derive the classescur*acct and sav*acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks: a. Accept deposit from a costumer and update the balance. b. Display the balance

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS202M	**DCC**	**Object Oriented Programming with C++**	**60**	**20**	**20**	**30**	**20**	**3**	0	**2**	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

	c. Compute and deposit interest. d. Permit withdrawal and update the balance. Check for the minimum balance, impose penalty, necessary and update balance.
12.	Create a base class shape. Use this class to store two double type values that could be used to compute area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base a member function getdata() to initialize base class data member and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine it the derived class to suit their requirements.

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT201M	**DCC**	**Data Communication**	**60**	**20**	**20**	**0**	**0**	**3**	0	**0**	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	To understand the concepts of data communications.
2.	To be familiar with the Transmission media and Tools.
3.	To study the functions of OSI layers.
4.	To learn about IEEE standards in computer networking.
5.	To get familiarized with different protocols and network components.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Understand the Process and functions of data communications
2.	Understand Transmission media and Tools
3.	Understand the functions of OSI layers
4.	Understand IEEE standards in computer networking
5.	Understand different protocols and network components

SYLLABUS

UNIT I	**10 HOURS**

Introduction: Data Communication Components, Types of Connections, Transmission Modes, Network Devices, Topologies, Protocols and Standards, OSI Model, Transmission Media, Bandwidth, Bit Rate, Bit Length, Baseband and Broadband Transmission, Attenuation, Distortion, Noise, Throughout, Delay and Jitter.

UNIT II	**9 HOURS**

Data Encoding: Unipolar, Polar, Bipolar, Line and Block Codes. Multiplexing: Introduction and History, FDM, TDM, WDM, Synchronous and Statistical TDM.Synchronous and Asynchronous transmission, Serial and Parallel Transmission.

UNIT III	**8 HOURS**

Error Detection & Correction: Correction, Introduction–Block Coding–Hamming Distance, CRC, Flow Control and Error Control, Stop and Wait, Error Detection and Error Go Back– N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, CSMA/CD, CDMA/CA.

UNIT IV	**7 HOURS**

Network Switching Techniques: Circuit, Message, Packet and Hybrid Switching Techniques.X.25, ISDN.Logical Addressing, Ipv4, Ipv6, Address Mapping, ARP, RARP, BOOTP and DHCP, User Datagram Protocol, Transmission Control Protocol, SCTP.

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT201M	**DCC**	**Data Communication**	**60**	**20**	**20**	**0**	**0**	**3**	0	**0**	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT V	**8 HOURS**
Application Layer Protocols: Domain Name Service Protocol, File Transfer Protocol, TELNET, WWW and Hyper Text Transfer Protocol, Simple Network Management Protocol, Simple Mail Transfer Protocol, Post Office Protocol v3.	
TEXTBOOKS:	
1.	Behrouz A. Forouzan, "Data communication and Networking", FourthEdition,Tata McGraw Hill, 2011.
REFERENCE:	
1.	Larry L.Peterson, Peter S. Davie, "Computer Networks", Fifth Edition,Elsevier, 2012
2.	William Stallings, "Data and Computer Communication", Eighth Edition, Pearson Education,2007.
3.	James F. Kurose, Keith W. Ross, "Computer Networking: A Top–Down Approach Featuring theInternet", Pearson Education, 2005

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSMOB201N	**SEC**	**Mobile Application Development - II**	**0**	**0**	**0**	**30**	**20**	**0**	0	**2**	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	To introduce functions, Closures and Class in Swift Language.
2.	Understand the Object oriented and Procedure oriented concepts of Swift.
3.	Learn the Concepts of Inheritance, Enumerations and Initializes in Swift
4.	To provide knowledge of class and Structures for Mobile app development

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Understand the functions, Closures and Class used in Swift programming Language.
2.	Proficient in using the the Object oriented and Procedure oriented concepts of Swift, to develop program
3.	Apply the Knowledge Class and Structures for iOS App development
4.	Understand the fundamentals of Swift and be able to apply it in iOS app development

SYLLABUS

UNIT I

Functions: Defining and Calling Functions, Function Parameters and Return Values: Functions Without Return Values, Functions with Multiple Return Values, Optional Tuple Return Types Function Argument Labels and Parameter Names: Specifying Argument Labels, Omitting Argument Labels, Default Parameter Values, Variadic Parameters, Function Types, Function Types as Parameter Types.

UNIT II

Closures and Enumeration: Closure Expressions, Inferring Type From Context, Implicit Returns from Single-Expression Closures, Shorthand Argument Names, Operator Methods, Trailing Closures, Capturing Values, Escaping Closures. Enumeration : Enumeration , Enumeration with Switch Statement, Iterating Enumeration Cases , Associated Values, Raw Values, Recursive Enumerations.

UNIT III

Structures and Classes: Definition Syntax, Structure and Class Instances, Accessing Properties, Member wise, Initializers for Structure Types, Value types or Reference Types. Properties: Stored Properties, Lazy Stored Properties, Computed Properties, Property Observers. Global and Local Variables, Type Properties, Type Property Syntax, Querying and Setting Type Properties.

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSMOB201N	**SEC**	**Mobile Application Development - II**	**0**	**0**	**0**	**30**	**20**	**0**	0	**2**	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV	
Method and Inheritance: Methods, Instance Methods, self-Property, Mutating Method, Type Methods Inheritance: Base Class, types of Inheritance, Subclassing, Overriding: Accessing Superclass Methods, Properties, and Subscripts, Overriding Methods, Overriding Properties, Overriding Property Getters and Setters, Preventing Overrides.	
UNIT V	
Initializers: Initializers, Default Property Values, Customizing Initialization, Initialization Parameters, Parameter Names and Argument Labels, Initializer Parameters Without Argument Labels, Optional Property Types, Default Initializers, Initializer Delegation for Value Types, Class Inheritance and Initialization, Initializer Inheritance and Overriding, Automatic Initializer Inheritance, Failable Initializers, Failable Initializers for Enumerations, Overriding a Failable Initializer.	

TEXTBOOKS:	
1.	Matthew Mathias, John Gallagher, Swift Programming: The Big Nerd Ranch Guide 2nd edition, 2015
2.	Matt Neuberg, iOS 12 Programming Fundamentals with Swift, OReilly; 5th edition
3.	App Development with Swift (as available on iBook Store).

REFERENCE:	
1.	Paris Buttfield-Addison, Jonathon Manning , Tim Nugent Learning Swift: Building Apps for macOS, iOS, and Beyond, O'Reilly Media, Inc., 3rd ed, 2018.
2.	Jon Hoffman, Mastering Swift 4, Packt Publishing Limited ,4th edition,2017.
3.	VandadNahavandipoor. iOS 11 Swift Programming Cookbook, O"Reilly Media, 2017
4.	S. Yamacli, Beginner"s Guide to iOS 11 App Development Using Swift 4: Xcode, Swift and App Design Fundamentals,(1e), USA: CreateSpace Independent Publishing Platform, 2017.

LIST OF PRACTICALS	
1.	Programs to demonstrate function with and without return type and parameters.
2.	Program to demonstrate function returning multiple values
3.	Program to demonstrate function returning optional tuple
4.	Programs to demonstrate function with and without argument label.
5.	Program to demonstrate Closures
6.	Program to demonstrate Single-Expression Closures
7.	Program to demonstrate Shorthand Argument Names

ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

B.Tech (Computer Science and Engineering - Mobile Applications-Apple Authorized Training Center)Choice Based Credit System (CBCS)-2024-28

SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSMOB201N	**SEC**	**Mobile Application Development - II**	**0**	**0**	**0**	**30**	**20**	**0**	0	**2**	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

8.	Program to demonstrate Trailing Closures.
9.	Program to demonstrate Enumeration
10.	Program to demonstrate with Switch case
11.	Program to demonstrate Enumeration Associated values, Raw Values
12.	Program to demonstrate Structure
13.	Program to demonstrate Properties, Member wise and Initializers for Structure Types.
14.	Programs to demonstrate Stored Properties, Lazy Stored Properties, Computed Properties, and Property Observers
15.	Programs to demonstrate different types of Inheritance in Swift.
16.	Programs to demonstrate Methods, Instance Methods, self-Property and Mutating Method
17.	Programs to demonstrate Accessing Super class Methods, Properties, Overriding Methods and Overriding Properties
18.	Programs to demonstrate Initializers, Default Property Values and Custom Initializers.
19.	Programs to demonstrate Initializer Inheritance, Overriding and Automatic Initializer Inheritance.
20.	Programs to demonstrate Failable Initializers, Failable Initializers for Enumerations and Overriding a Failable Initializer