

Department : <b>Chemistry</b>		Programme: <b>B.Tech.</b>						
Semester : <b>Third</b>		Course Category Code: <b>BSC</b>				Semester Exam Type: <b>TY</b>		
Course Code	Course Name	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
<b>SH201</b>	<b>Biology for Engineers</b>	3	-	-	2	40	60	100
<b>Prerequisite</b>	<b>Nil</b>							
<b>Course Outcome</b>	<b>CO1</b>	Convey that classification <i>per se</i> is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological						
	<b>CO2</b>	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring						
	<b>CO3</b>	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine						
	<b>CO4</b>	Gain a basic understanding of enzyme action and factors affecting their activity						
	<b>CO5</b>	Identify and classify microorganisms						
<b>UNIT-I</b>	<b>Classification</b>				<b>Periods: 9</b>			
Classification outline based on (a) cellularity- Unicellular or multicellular (b) ultrastructure prokaryotes or eukaryotes (c) Energy and Carbon utilisation - Autotrophs, heterotrophs, lithotrophs (d) Ammonia excretion – aminotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy three major kingdoms of life.								<b>CO1</b>
<b>UNIT-II</b>	<b>Genetics</b>				<b>Periods: 9</b>			
Mendel’s laws, Concept of segregation & independent assortment. Concept of allele. Recessiveness, and dominance. Single gene disorders in humans – Sickle cell disease, Phenylketonuria.								<b>CO2</b>
<b>UNIT-III</b>	<b>Biomolecules</b>				<b>Periods: 9</b>			
Carbohydrates: Types, Structural & functional importance. Lipids: Classification - Simple, compound, & derived, Importance of lipid soluble vitamins. Amino acids – general structure, essential amino acids. Proteins - Levels of protein structure, structural & functional importance of proteins, Enzymes- Definition, Enzyme Activity & Units, Specific Activity, Specificity, Factors affecting enzyme activity. Nucleic acids: Types and importance.								<b>CO3</b>
<b>UNIT-IV</b>	<b>Metabolism</b>				<b>Periods: 9</b>			
Introduction: Food chain & energy flow. Definitions - Anabolism & Catabolism. Photosynthesis: Reaction and importance. Glycolysis & TCA cycle. ATP – the energy currency of cells.								<b>CO4</b>
<b>UNIT-V</b>	<b>Microbiology</b>				<b>Periods: 9</b>			
Concept of single celled organisms. Concept of species & strains. Identification & classification of microorganisms. Virus – Definition, types, examples.								<b>CO5</b>
<b>Lecture Periods: 45</b>		<b>Tutorial Periods: -</b>		<b>Practical Periods: -</b>		<b>Total Periods: 45</b>		
<b>Reference Books</b>								
1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M,L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd.								
2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H. John Wiley and Sons.								
3. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company.								
4. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R. W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher.								
5. Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C.Brown Publishers.								

Department: <b>Electronic and Communication Engineering</b>				Programme: <b>B.Tech.(CS)</b>					
Semester : <b>Third</b>				Course Category Code: <b>ESC</b>			Semester Exam Type: <b>TY</b>		
Course Code	Course Name	Periods / Week			Credit	Maximum Marks			
		L	T	P		C	CA	SE	TM
<b>EC235</b>	<b>Electronic Devices and Digital Systems</b>	3	-	-	3	40	60	100	
<b>Prerequisite</b>	<b>Nil</b>								
<b>Course Outcome</b>	<b>CO1</b>	Understand the theory of diodes and their applications							
	<b>CO2</b>	Acquire an in-depth knowledge and apply the characteristics of BJTs and FETs in realizing them as basic building blocks of logic gates							
	<b>CO3</b>	Gain knowledge on Boolean logic and simplification of Boolean functions. Acquire the ability to develop any combinational logic functions and design combinational circuit							
	<b>CO4</b>	Understand the behaviour of synchronous sequential circuits to develop the practical digital circuit design techniques							
	<b>CO5</b>	Write Verilog HDL for the combinational and sequential circuits							
<b>UNIT-I</b>	<b>Diode and its Applications</b>				<b>Periods: 9</b>				
PN junction diode, Diode equivalent circuit, Diode as a switch –Zener diode, Applications of diode – AND/OR gates using diodes, Clippers and clippers – Voltage doubler and tripler – Voltage regulation – Series and shunt voltage regulators.								<b>CO1</b>	
<b>UNIT-II</b>	<b>Transistors – Types and applications</b>				<b>Periods: 9</b>				
NPN and PNP junction characteristics, Transistor types: BJTs, FETs and MOSFETs, Biasing techniques – CB, CE, CC; Transistors as switch, amplifier, buffer and one-bit memory cell; logic gates using transistors, output types: totem pole and open collector – Integrated Circuits – SSI, MSI, LSI and VLSI.								<b>CO2</b>	
<b>UNIT-III</b>	<b>Boolean Algebra and Combinational Logic</b>				<b>Periods: 9</b>				
Boolean algebra -Basic operations -Basic Theorems -Boolean functions-Canonical forms -Simplification of Boolean functions-Karnaugh maps - Tabulation method. Adders – subtractors – code converters – binary parallel adder –decimal adder – magnitude comparator – encoders – decoders – multiplexers – de-multiplexers- Binary Multiplier.								<b>CO3</b>	
<b>UNIT-IV</b>	<b>Sequential Circuits and Memory</b>				<b>Periods: 9</b>				
Sequential Circuits-latches –flip flops –analysis of clocked sequential circuits –state reduction and assignments. Registers and Counters: Registers – shift registers – ripple counters – synchronous counters – other counters. Random access memory – memory decoding - Read only memory – Programmable Logic Array – Programmable Array Logic.								<b>CO4</b>	
<b>UNIT-V</b>	<b>Digital Logic Design Using Verilog HDL</b>				<b>Periods: 9</b>				
Lexical Conventions – Data Types – System tasks –Module definition – Port Declaration – Gate Level modeling using basic Verilog gate primitives – Dataflow Modeling – Continuous Assignments – Operator Types – Delay Specification – Behavioral Modeling – Structured Procedures – always and initial block – blocking and non-blocking assignments – conditional statements – multi-way branching – loops – sequential and parallel block – Subprogram Declaration – Tasks and Function.								<b>CO5</b>	
<b>Lecture Periods: 45</b>		<b>Tutorial Periods: -</b>		<b>Practical Periods: -</b>		<b>Total Periods: 45</b>			
<b>Reference Books</b>									
1. J. Millman, C. Halkias and Satyabrata, Electronic devices and Circuits, Third Edition, McGraw Hill, 2010.									
2. Robert L. Boylestead and Louis Nashelsky, Electron Devices and Circuits Theory, Eleventh Edition, Prentice Hall of India, 2013.									
3. M. Morris Mano and Michael Ciletti, Digital Design, Sixth Edition, Pearson India Education Services, Pvt. Ltd., 2018.									
4. Stephen Brown and Zvonko Vranesic, Fundamentals of Digital Logic with Verilog Design, Tata McGraw-Hill Publishing Company Ltd., 2006.									

Department : <b>Computer Science and Engineering</b>			Programme: <b>B.Tech. (CS)</b>						
Semester : <b>Third</b>			Course Category Code: <b>PCC</b>			Semester Exam Type: <b>TY</b>			
Course Code	Course Name		Periods / Week			Credit	Maximum Marks		
			L	T	P	C	CA	SE	TM
<b>CS203</b>	<b>Computer Organization and Architecture</b>		3	1	-	4	40	60	100
<b>Prerequisite</b>	<b>Nil</b>								
<b>Course Outcome</b>	<b>CO1</b>	Understand computer types, instructions and instruction sequencing							
	<b>CO2</b>	Demonstrate the theory and architecture of processing unit and pipeline processing							
	<b>CO3</b>	Make use of the arithmetic techniques for solving problems							
	<b>CO4</b>	Understand memory hierarchy and its impact on computer cost/performance							
	<b>CO5</b>	Explain the different ways of communicating with i/o devices and standard i/o interfaces							
<b>UNIT-I</b>	<b>Basic Structures of Computer</b>					<b>Periods: 12</b>			
Computer Types, Functional Units, Basic Operational Concepts, Number Representation and Arithmetic Operations, Character Representation, Performance, Historical Perspective, Memory Locations and Addresses, Memory operations, Instructions and Instruction Sequencing, Addressing modes, Assembly Language, Stacks and Queues, Subroutines, Shift and Rotate Instructions, CISC Instruction Sets, RISC Vs CISC.									<b>CO1</b>
<b>UNIT-II</b>	<b>Basic Processing Unit and Pipelining</b>					<b>Periods: 12</b>			
Fundamental Concepts, Instruction Execution, Hardware Components, Instruction Fetch and Execution Steps, Control Signals, Hardwired Control, CISC-Style Processors, Pipelining: Basic Concept, Pipeline Organization, Pipelining Issues, Data Dependencies, Memory Delays, Branch Delays, Resource Limitations.									<b>CO2</b>
<b>UNIT-III</b>	<b>Computer Arithmetic</b>					<b>Periods: 12</b>			
Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Unsigned Numbers, Multiplication of Signed Numbers, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations.									<b>CO3</b>
<b>UNIT-IV</b>	<b>Memory System</b>					<b>Periods: 12</b>			
Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Direct Memory Access, Memory Hierarchy, Cache Memories, Performance Considerations, Virtual memories, Memory Management requirements, Secondary Storage.									<b>CO4</b>
<b>UNIT-V</b>	<b>Input /Output Organization</b>					<b>Periods: 12</b>			
Accessing I/O Devices : I/O Device Interface, Program-Controlled I/O, Interrupts: Enabling and Disabling Interrupts, Handling Multiple Devices, Controlling Device Behaviour, Processor Control Registers, Exceptions, Bus Structure, Bus Operation, Arbitration, Interface Circuits, Interconnection Standards: USB, FireWire, PCI Bus, SCSI.									<b>CO5</b>
<b>Lecture Periods: 45</b>			<b>Tutorial Periods: 15</b>		<b>Practical Periods: -</b>		<b>Total Periods: 60</b>		
<b>Reference Books</b>									
1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, Computer Organization and Embedded Systems, Sixth Edition, Tata McGraw Hill, 2012.									
2. John P. Hayes, Computer Architecture and Organization, Third Edition, Tata McGraw Hill, 2013.									
3. William Stallings, Computer Organization and Architecture, Designing for Performance, Tenth Edition, Pearson Education, 2016.									
4. John Hennessy and David Patterson, Computer Architecture, A Quantitative Approach, Sixth Edition, Morgan Kaufmann, 2017.									

Department : <b>Computer Science and Engineering</b>				Programme: <b>B.Tech. (CS)</b>						
Semester : <b>Third</b>				Course Category Code: <b>PCC</b>			Semester Exam Type: <b>TY</b>			
Course Code	Course Name			Periods / Week			Credit	Maximum Marks		
				L	T	P	C	CA	SE	TM
<b>CS204</b>	<b>Data Structures</b>			3	-	-	3	40	60	100
<b>Prerequisite</b>	<b>Nil</b>									
<b>Course Outcome</b>	<b>CO1</b>	Ability to comprehend the basics of algorithms and sorting process using arrays								
	<b>CO2</b>	Understand the linear data structures and its applications								
	<b>CO3</b>	Ability to realize the tree and how it is used for searching in large database								
	<b>CO4</b>	Build graph data structure for various applications								
	<b>CO5</b>	Develop algorithms for hash table operations								
<b>UNIT-I</b>	<b>Introduction</b>						<b>Periods: 9</b>			
Algorithmic notation – Programming principles –Analyzing algorithms. Arrays: One dimensional array, multidimensional array, pointer arrays. Searching: Linear search, Binary Search, Fibonacci search. Sorting techniques: Internal sorting - Insertion Sort, Selection Sort, Bubble Sort, Quick Sort, Heap Sort and Merge Sort.										<b>CO1</b>
<b>UNIT-II</b>	<b>Stack, Queue and Linked lists</b>						<b>Periods: 9</b>			
Stacks: Definition – operations - applications of stack. Queues: Definition - operations - Priority queues – De-queues – Applications of queue. Linked List: Singly Linked List, Doubly Linked List, Circular Linked List, linked stacks, Linked queues, Applications of Linked List – Dynamic storage management.										<b>CO2</b>
<b>UNIT-III</b>	<b>Tree</b>						<b>Periods: 9</b>			
Tree: Definition - Binary tree – Terminology – Representation – operations - Applications – Binary search tree – AVL tree. B Trees: B Tree indexing - operations on a B Tree - B + Tree Indexing. Trie - Trie operations – Introduction to Patricia Tree.										<b>CO3</b>
<b>UNIT-IV</b>	<b>Graph</b>						<b>Periods: 9</b>			
Graph: Definition – Terminology – Representation - Traversals – Applications - spanning tree, shortest path and Transitive closure, Topological sort. Set: Definition - Representation - Operations on sets – Applications.										<b>CO4</b>
<b>UNIT-V</b>	<b>Hash Table</b>						<b>Periods: 9</b>			
Tables: Rectangular tables - Jagged tables – Inverted tables - Symbol tables – Static tree tables - Dynamic tree tables - Hash tables. Files: Sequential organization – Index organization.										<b>CO5</b>
<b>Lecture Periods: 45</b>			<b>Tutorial Periods: -</b>		<b>Practical Periods: -</b>			<b>Total Periods: 45</b>		
<b>Reference Books</b>										
1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Book Source, Pvt. Ltd., 2004.										
2. D. Samanta, Classic Data Structures, Second Edition, Prentice-Hall of India, Pvt. Ltd., India, 2012.										

Department : <b>Computer Science and Engineering</b>				Programme: <b>B.Tech. (CS)</b>						
Semester : <b>Third</b>				Course Category Code: <b>PCC</b>			Semester Exam Type: <b>TY</b>			
Course Code	Course Name			Periods / Week			Credit	Maximum Marks		
				L	T	P	C	CA	SE	TM
<b>CS205</b>	<b>Object Oriented Programming Languages</b>			3	-	-	3	40	60	100
<b>Prerequisite</b>	<b>Nil</b>									
<b>Course Outcome</b>	<b>CO1</b>	Adapt C++ Programming concepts to construct application								
	<b>CO2</b>	Experiment object oriented features and work with memory models								
	<b>CO3</b>	Understand and Apply basics of java programming language								
	<b>CO4</b>	Design application using controls and database								
	<b>CO5</b>	Experiment latest concepts of java programming model								
<b>UNIT-I</b>	<b>Introduction to C++ Programming Language</b>						<b>Periods: 9</b>			
Programming paradigms, C++–data types – stream classes –Manipulators– Control structure. Inline functions –Recursion–function overloading. Classes and objects - array of objects – friend functions–overloading member functions. Constructors and Destructors.										<b>CO1</b>
<b>UNIT-II</b>	<b>Object Oriented Features of C++</b>						<b>Periods: 9</b>			
Overloading unary operators and binary operators –type conversion. Inheritance – Types of Inheritance – Virtual base classes – abstract classes. Pointer to class and object – pointer to derived classes and base classes –Arrays. Memory-Memory models – new and delete operators – dynamic objects. Binding, Polymorphism and Virtual Functions –Virtual functions - Strings –Templates-Exception Handling.										<b>CO2</b>
<b>UNIT-III</b>	<b>Java Basics</b>						<b>Periods: 9</b>			
Java features –Java Platform –Java Fundamentals –Data Types – Variables and Arrays - Expressions, Operators, and Control Structures – Classes and Objects -Methods - Constructors – Destructors - Inheritance – Types Packages, Polymorphism- Abstract classes and Interfaces -Overloading.										<b>CO3</b>
<b>UNIT-IV</b>	<b>GUI and JDBC</b>						<b>Periods: 9</b>			
Swings-controls- LayoutManagers -Panel-Dialog, JDBC Introduction-JDBC Architecture-Types of Drivers-Statement-ResultSet-PreparedStatement, Multithreading, Concurrency.										<b>CO4</b>
<b>UNIT-V</b>	<b>Collections and Java 8</b>						<b>Periods: 9</b>			
Strings, IO, collections-ArrayList-Vector-LinkedList-HashSet-TreeMap-Iterator- Comparator, Lambdas and Streams, JavaFX, Java Time API.										<b>CO5</b>
<b>Lecture Periods: 45</b>			<b>Tutorial Periods: -</b>		<b>Practical Periods: -</b>			<b>Total Periods: 45</b>		
<b>Reference Books</b>										
1. Deitel and Deitel, C++ How to program, Ninth Edition, Prentice Hall, 2014.										
2. Deitel and Deitel, JAVA How to Program, Eleventh Edition, Prentice Hall, 2017.										
3. Herbert Schildt, Java SE 6: The Complete Reference, Eleventh Edition, McGraw-Hill, 2018.										
4. Cay S. Horstmann, Core Java: Volume II-Advanced Features, Eleventh Edition, Prentice Hall, 2019.										

Department: <b>Electronic and Communication Engineering</b>				Programme: <b>B.Tech. (CS)</b>					
Semester : <b>Third</b>				Course Category Code: <b>ESC</b>			Semester Exam Type: <b>LB</b>		
Course Code	Course Name	Periods / Week			Credit	Maximum Marks			
		L	T	P		C	CA	SE	TM
<b>EC236</b>	<b>Electronic Devices and Digital Systems Laboratory</b>	-	-	3	1.5	40	60	100	
<b>Prerequisite</b>	<b>Nil</b>								
<b>Course Outcome</b>	<b>CO1</b>	Study and thoroughly analyze the working of diodes and their applications							
	<b>CO2</b>	Understand the characteristics of BJT and FET and also able to determine its parameters							
	<b>CO3</b>	Understand the application of transistor as an amplifier and also analyze its Frequency response characteristics							
	<b>CO4</b>	Design the adders and subtractors using basic logic gates and also able to apply the Boolean algebra to simplify the Boolean expressions to realize the given functions using Multiplexers and Decoders							
	<b>CO5</b>	Write Verilog HDL for the combinational and sequential circuits and verify its functionality							
1. VI characteristics of LED and Zener diodes.							<b>CO1</b>		
2. Application of Diodes - Clippers, Clampers, AND gate and OR gate.									
3. Input and Output Characteristics of Common Emitter transistor configuration and determination of h-parameters.							<b>CO2</b>		
4. Drain characteristics of JFET and determination of Drain resistance, Mutual conductance and Amplification factor.									
5. Frequency Response of RC-coupled amplifier and determination of input and output impedances.							<b>CO3</b>		
6. Verification of DeMorgan’s theorems using basic logic gates and design and implementation of adders and subtractors.							<b>CO4</b>		
7. Design and implementation of simplified Boolean expressions using Multiplexers and decoders.									
8. Verification of the design functionality of Adder, Subtractor and Carry Look-Ahead Adder using Verilog HDL.							<b>CO5</b>		
9. Verification of the design functionality of Parity Generator/Checkers and Magnitude Comparators using Verilog HDL.									
10. Verification of the design functionality of flip flops, ripple counters and shift registers using Verilog HDL.									
<b>Lecture Periods: -</b>		<b>Tutorial Periods: -</b>		<b>Practical Periods: 45</b>		<b>Total Periods: 45</b>			
<b>Reference Books</b>									
1. David A. Bell, Electronic Devices and Circuits, Fifth Edition, Prentice Hall of India, 2008.									
2. Stephen Brown and Zvonko Vranesic, Fundamentals of Digital Logic with Verilog Design, Tata McGraw-Hill Publishing Company Ltd., 2006.									

Department : <b>Computer Science and Engineering</b>				Programme: <b>B.Tech. (CS)</b>					
Semester : <b>Third</b>				Course Category Code: <b>PCC</b>			Semester Exam Type: <b>LB</b>		
Course Code	Course Name		Periods / Week			Credit	Maximum Marks		
			L	T	P	C	CA	SE	TM
<b>CS206</b>	<b>Data Structures Laboratory</b>		-	-	3	1.5	40	60	100
<b>Prerequisite</b>	<b>Nil</b>								
<b>Course Outcome</b>	<b>CO1</b>	Ability to write programs for search and sorting algorithms							
	<b>CO2</b>	Able to write simple c programs using most frequently used control structures							
	<b>CO3</b>	Apply the methods problems using arrays and functions							
	<b>CO4</b>	Learnt to handle data processing using structures for simple applications							
	<b>CO5</b>	Write programs that could handle file i/o and pointers							
1. Searching Algorithms (With the Number of Key Comparisons) : - Sequential, Binary and Fibonacci Search Algorithms on an Ordered List									<b>CO1</b>
2. Sorting Algorithms (Any Five): Insertion Sort, Selection Sort, Shell Sort, Bubble Sort, Quick Sort, Heap Sort, Merge Sort, and Radix Sort.									
3. Implementation of Stack and Its Operations.									<b>CO2</b>
4. Application of Stack for Converting an Arithmetic Expression into Postfix Form and Evaluation of Postfix Expression.									
5. Implementation of Queue, Circular Queue, Priority Queue, Dequeue and Their Operations.									
6. Implementation of Singly Linked List, Doubly Linked List, Circular Linked List.									
7. Implementation of Binary Tree and Binary Traversal Techniques.									<b>CO3</b>
8. Implementation of Graph Traversal Techniques.									<b>CO4</b>
9. Dijkstra’s Algorithm to Obtain the Shortest Paths.									<b>CO5</b>
10. Implementation of Hash Tables and Its Operations.									<b>CO5</b>
<b>Lecture Periods: -</b>			<b>Tutorial Periods: -</b>		<b>Practical Periods: 45</b>		<b>Total Periods: 45</b>		
<b>Reference Books</b>									
1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Book Source, Pvt. Ltd., 2004.									
2. D. Samanta, Classic Data Structures, Second Edition, Prentice-Hall of India, Pvt. Ltd., India, 2012.									

Department : <b>Computer Science and Engineering</b>				Programme: <b>B.Tech. (CS)</b>					
Semester : <b>Third</b>				Course Category Code: <b>PCC</b>			Semester Exam Type: <b>LB</b>		
Course Code	Course Name		Periods / Week			Credit	Maximum Marks		
			L	T	P	C	CA	SE	TM
<b>CS207</b>	<b>Object Oriented Programming Languages Laboratory</b>		-	-	3	1.5	40	60	100
<b>Prerequisite</b>	<b>Nil</b>								
<b>Course Outcome</b>	<b>CO1</b>	Experiment C++ Programming concepts to construct application							
	<b>CO2</b>	Develop C++ application with Object Oriented features							
	<b>CO3</b>	Experiment basics of java programming language							
	<b>CO4</b>	Design and implement application using controls and database							
	<b>CO5</b>	Experiment latest concepts of java programming model							
<b>Programming Using C++</b>									
1. Program to implement classes and objects. 2. Program to implement constructors and destructors with array of objects. 3. Program to demonstrate function overloading. 4. Program to implement strings and Exception handling 5. Program to implement different types of inheritances like multiple, Multilevel and hybrid. 6. Programs to implement virtual functions to demonstrate the use of run time polymorphism 7. Program to implement class and function templates.									<b>CO1 CO2</b>
<b>Programming Using Java</b>									
1. Study of execution of simple Java programs. 2. Programs to implement classes and objects in java. 3. Programs to implement constructors and destructors in Java 4. Programs to demonstrate wrapper classes, inheritance and interfaces in Java. 5. Program to demonstrate exception handling technique. 6. Program to design and implement swing concepts. 7. Program to design and implement JDBC. 8. Program to design an event handling event for simulating a simple calculator. 9. Programs to explore collection classes in java. 10. Programs to demonstrate Java 8 features in application.									<b>CO3 CO4 CO5</b>
<b>Lecture Periods: -</b>		<b>Tutorial Periods: -</b>		<b>Practical Periods: 45</b>			<b>Total Periods: 45</b>		
<b>Reference Books</b>									
1. Deitel and Deitel, C++ How to program, Ninth Edition, Prentice Hall, 2014. 2. Deitel and Deitel, JAVA How to Program, Eleventh Edition, Prentice Hall, 2017. 3. Cay S. Horstmann, Core Java: Volume II-Advanced Features, Eleventh Edition, Prentice Hall, 2019.									



Department : <b>Humanities and Social Sciences</b>		Programme: <b>B.Tech.</b>						
Semester : <b>Third</b>		Course Category Code: <b>MCC</b>			Semester Exam Type: -			
Course Code	Course Name	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
<b>SH202</b>	<b>Indian Constitution</b>	3	-	-	-	-	-	-
<b>Prerequisite</b>	<b>Nil</b>							
<b>Course Outcome</b>	<b>CO1</b>	Understand the essence and significance of the constitution						
	<b>CO2</b>	Recognize ones fundamental duties and rights						
	<b>CO3</b>	Appreciate the structure and functions of legislature, executive and judiciary						
	<b>CO4</b>	Understand the functioning of state governments and union territories						
	<b>CO5</b>	Understand the centre-state relations and functioning of constitutional bodies						
<b>UNIT-I</b>	<b>Introduction of Indian Constitution</b>				<b>Periods: 9</b>			
The Making of Indian Constitution - The Constituent Assembly - Sources of Indian Constitution - Preamble and the Supreme Court’s Judgments on Preamble.								<b>CO1</b>
<b>UNIT-II</b>	<b>State, Rights and Duties</b>				<b>Periods: 9</b>			
State and Union Territories – Citizenship - Fundamental Rights - Directive Principles of State Policy - Fundamental Duties.								<b>CO2</b>
<b>UNIT-III</b>	<b>Union Government</b>				<b>Periods: 9</b>			
Union Government - The Powers and Functions of the President, Vice–President, Council of Ministers, Prime Minister, Judiciary, Supreme Court - Judicial Review - Judicial Activism- Public Interest Litigation - Power and Functions of the Parliament -Budget Power and Functions of Parliament, Speaker of Lok Sabha.								<b>CO3</b>
<b>UNIT-IV</b>	<b>State Governments</b>				<b>Periods: 9</b>			
State Governments – Governor - State Council of Ministers - Chief Minister- Legislative Assembly- High Courts - Union Territories -Panchayati Raj Institutions - 73th and 74th Constitutional Amendment – Gram Panchayats - Block Panchayats - Municipalities.								<b>CO4</b>
<b>UNIT-V</b>	<b>Union- State Relations, Constitutional Bodies</b>				<b>Periods: 9</b>			
Centre – State Relations - Public Service - Election Commission - NITI Ayog, Emergency Powers of the President- Constitution Amendment Procedure- Right to Information Act - Right to Education. Major Constitutional Amendments and their impact on Indian Political System.								<b>CO5</b>
<b>Lecture Periods: 45</b>		<b>Tutorial Periods: -</b>		<b>Practical Periods: -</b>		<b>Total Periods: 45</b>		
<b>Reference Books</b>								
1. Austin, Granville. The Indian Constitution: Cornerstone of a Nation. Oxford University Press, 1999.								
2. Basu, Durga Das, et al. Introduction to the Constitution of India. 20th ed., Thoroughly Rev, Lexis Nexis Butterworths Wadhwa Nagpur, 2008.								
3. Choudhry, Sujit, et al., editors. The Oxford Handbook of the Indian Constitution. Oxford University Press, 2016.								
4. Bakshi, Parvinrai Mulwantrai, and Subhash C. Kashyap, The Constitution of India (Universal Law Publishing), 2016.								
5. Bhargava, Rajeev, Politics and Ethics of the Indian Constitution, 2009.								
6. Rajeev Bhargava, The Promise of India’s Secular Democracy, 2010.								
7. Chakrabarty, Bidyut, India’s Constitutional Identity: Ideological Beliefs and Preferences (Routledge), 2019.								
8. Jayal, Niraja Gopal, and Pratap Bhanu Mehta, The Oxford Companion to Politics in India, Oxford University Press, 2010.								
9. Kashyap, Subhash C., Our Constitution: An Introduction to India’s Constitution and Constitutional Law (NBT India), 1994.								
10. Kashyap, Subhash C. Our Parliament: An Introduction to the Parliament of India. Revised edition, National Book Trust, India, 2011.								
11. Subhash C. Kashyap Our Constitution Paperback – (NBT India), 2012.								
12. Laxmikanth, M., INDIANPOLITY, McGraw-Hill Education Constitution of India, Ministry of Law and Justice, Govt. of India.								