



“Education for Knowledge, Science, and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

**Vivekanand College, Kolhapur  
(Autonomous)**



KOLHAPUR (AUTONOMOUS)

**B Sc Computer Science Entire (B.C.S.)**

**Curricular Relevance: Course outcomes with relevance to Local, Regional, National & global needs**

Sr no.	Name of the Course	Course Code	Year of introduction	COs and POs with relevance to local/ regional /needs	COs & POs with relevance to national needs	COs & POs with relevance to global needs
1	SEM - I English for Business Communication	AECC	2018-19	<b>CO1:</b> To understand the concept, process and importance of communication. <b>CO2:</b> To gain knowledge of media of communication. <b>CO3:</b> To develop skills of effective communication - both written and oral. <b>CO4:</b> To make students familiar with information technology	<b>CO1:</b> To understand the concept, process and importance of communication. <b>CO2:</b> To gain knowledge of media of communication. <b>CO3:</b> To develop skills of effective communication - both written and oral. <b>CO4:</b> To make students familiar with information technology	<b>CO1:</b> To understand the concept, process and importance of communication. <b>CO2:</b> To gain knowledge of media of communication. <b>CO3:</b> To develop skills of effective communication - both written and oral. <b>CO4:</b> To make students familiar with information technology
2	Mathematics	GEC-1300A	2018-19	<b>CO1:</b> Construct simple mathematical proofs and possess the ability to verify them. Comprehend formal logical arguments. <b>CO2:</b> Apply basic counting techniques of combinatorial problems. <b>CO3:</b> Classify numbers into number sets. Determine function is one-one and Onto. <b>CO4:</b> Prove results involving divisibility & greatest common divisors.	<b>CO1:</b> Construct simple mathematical proofs and possess the ability to verify them. Comprehend formal logical arguments. <b>CO2:</b> Apply basic counting techniques of combinatorial problems. <b>CO3:</b> Classify numbers into number sets. Determine function is one-one and Onto. <b>CO4:</b> Prove results involving divisibility & greatest common divisors.	<b>CO1:</b> Construct simple mathematical proofs and possess the ability to verify them. Comprehend formal logical arguments. <b>CO2:</b> Apply basic counting techniques of combinatorial problems. <b>CO3:</b> Classify numbers into number sets. Determine function is one-one and Onto. <b>CO4:</b> Prove results involving divisibility & greatest common divisors.



3	Electronics	GEC-1301A	2018-19	<p><b>CO1:</b> Study the current voltage characteristics of semiconductor devices, understand the behavior of basic electronic components, Explain the concept of circuit laws and network theorems and apply them to laboratory measurements <b>CO2:</b> Understand to semiconductor devices. <b>CO3:</b> Understand basic digital electronic systems. <b>CO4:</b> Teach basic principles of programming. Develop skills for writing programs using 'C'.</p>	<p><b>CO1:</b> Study the current voltage characteristics of semiconductor devices, understand the behavior of basic electronic components, Explain the concept of circuit laws and network theorems and apply them to laboratory measurements <b>CO2:</b> Understand to semiconductor devices. <b>CO3:</b> Understand basic digital electronic systems. <b>CO4:</b> Teach basic principles of programming. Develop skills for writing programs using 'C'.</p>	<p><b>CO1:</b> Study the current voltage characteristics of semiconductor devices, understand the behavior of basic electronic components, Explain the concept of circuit laws and network theorems and apply them to laboratory measurements <b>CO2:</b> Understand to semiconductor devices.. <b>CO3:</b> Understand basic digital electronic systems. <b>CO4:</b> Teach basic principles of programming. Develop skills for writing programs using 'C'.</p>
4	Descriptive statistics-I and Discrete probability distributions	GEC-1302 A	2018-19	<p><b>CO1:</b> To classify, tabulate and represent the data graphically. <b>CO2:</b> To compute and interpret various measures of central tendency, dispersion, moments, skewness and kurtosis. <b>CO3:</b> To compute probabilities by using definition and probability rules. <b>CO4:</b> To compute probabilities by using discrete probability distributions.</p>	<p><b>CO1:</b> To classify, tabulate and represent the data graphically. <b>CO2:</b> To compute and interpret various measures of central tendency, dispersion, moments, skewness and kurtosis. <b>CO3:</b> To compute probabilities by using definition and probability rules. <b>CO4:</b> To compute probabilities by using discrete probability distributions.</p>	<p><b>CO1:</b> To classify, tabulate and represent the data graphically. <b>CO2:</b> To compute and interpret various measures of central tendency, dispersion, moments, skewness and kurtosis. <b>CO3:</b> To compute probabilities by using definition and probability rules. <b>CO4:</b> To compute probabilities by using discrete probability distributions.</p>
5	Computer Science	CC-CS-1303A	2018-19	<p><b>CO1:</b> Understand Basic elements of a communication system, Data Transmission modes, Data Transmission media, Types of networking Network Topologies, Concept of Pointer <b>CO2:</b> Understand Information Technology IT Assets and its managements, IT Act, Definition, declaration, prototype of function, Local and global variable, User defined functions, Storage classes, Recursion, Pointer and function, Call by value and Call by reference. <b>CO3:</b> Understand</p>	<p><b>CO1:</b> Understand Basic elements of a communication system, Data Transmission modes, Data Transmission media, Types of networking Network Topologies, Concepts of pointer. <b>CO2:</b> Understand Information Technology IT Assets and its managements, IT Act, Definition, declaration, prototype of function, Local and global variable, User defined functions, Storage classes, Recursion, Pointer and function, Call by value and Call by reference. <b>CO3:</b> Understand Database Management</p>	<p><b>CO1:</b> Understand Basic elements of a communication system, Data Transmission modes, Data Transmission media, Types of networking Network Topologies. Concept of pointers <b>CO2:</b> Understand Information Technology IT Assets and its managements. , Definition, declaration, prototype of function. Local and global variable, User defined functions, Storage classes, Recursion, Pointer and function, Call by value and Call by reference. <b>CO3:</b> Understand Database Management System, Data Models, Concept of RDBMS, Definition and declaration of structures, Definition of Union and declaration, Difference</p>



				Database Management System <b>CO4:</b> Understand Oracle Data types, Classification of SQL commands, Data Constraints, Concept of File, Text and binary files, Opening and closing files, File opening mode	<b>CO4:</b> Understand Oracle Data types, Classification of SQL commands, Data Constraints, Concept of File, Text and binary files, Opening and closing files, File opening mode	between structure and union. <b>CO4:</b> Understand Oracle Data types, Classification of SQL commands, Data Constraints, Concept of File, Text and binary files, Opening and closing files, File opening mode
6	Sem II English for Business Communication	AECC	2018-19	<b>CO1:</b> To acquaint the students with employment communication—Writing Resume, Acquiring Interview Skills etc.. <b>CO2:</b> To introduce the students with the knowledge of office management <b>CO3:</b> To develop skills of effective communication - both written and oral <b>CO4:</b> To make students familiar with modern technology	<b>CO1:</b> To acquaint the students with employment communication—Writing Resume, Acquiring Interview Skills etc.. <b>CO2:</b> To introduce the students with the knowledge of office management <b>CO3:</b> To develop skills of effective communication - both written and oral <b>CO4:</b> To make students familiar with modern technology	<b>CO1:</b> To acquaint the students with employment communication—Writing Resume. Acquiring Interview Skills etc.. <b>CO2:</b> To introduce the students with the knowledge of office management <b>CO3:</b> To develop skills of effective communication - both written and oral <b>CO4:</b> To make students familiar with modern technology
7	Mathematics	GEC-1300A	2018-19	<b>CO1:</b> Apply principles and concepts of graph theory in practical situations. in . <b>CO2:</b> To model real world problems using graph theory. To model real world problems using graph theory <b>CO3:</b> Inspect the value of the limit of a function at a point using the definition of the limit. <b>CO4:</b> Experiment with differentiation of exponential, logarithmic, trigonometric & inverse trigonometric functions n times.	<b>CO1:</b> Apply principles and concepts of graph theory in practical situations. Understand applications of graph theory in areas of Computer Science,Biology ,Chemistry ,Physics, Sociology etc. <b>CO2:</b> To model real world problems using graph theory. To model real world problems using graph theory <b>CO3:</b> Inspect the value of the limit of a function at a point using the definition of the limit. <b>CO4:</b> Experiment with differentiation of exponential, logarithmic, trigonometric & inverse trigonometric functions n times.	<b>CO1:</b> Apply principles and concepts of graph theory in practical situations. Understand applications of graph theory in areas of Computer Science,Biology ,Chemistry ,Physics, Sociology etc. <b>CO2:</b> To model real world problems using graph theory. To model real world problems using graph theory <b>CO3:</b> Inspect the value of the limit of a function at a point using the definition of the limit. <b>CO4:</b> Experiment with differentiation of exponential, logarithmic, trigonometric & inverse trigonometric functions n times.



8	Electronics	GEC-1301B	2018-19	<p><b>CO1:</b> Design and analyze the basic operations of MOSFET. Know about the multistage amplifier using BJT in various configurations to determine frequency response and concept of voltage gain <b>CO2:</b> Understanding various operating modes of Op-amp and its linear/non-linear applications <b>CO3:</b> Study different types of multivibrator and wave form generator using IC555. Understand concept of memories and types of memories <b>CO4:</b> Understand the basic architecture of 8-bit microprocessors and 16 bit microprocessor. Identify the addressing modes of an instruction.</p>	<p><b>CO1:</b> Design and analyze the basic operations of MOSFET. <b>CO2:</b> Understand and analyze the IC 741 operational amplifier and its characteristics. Understanding various operating modes of Op-amp and its linear/non-linear applications <b>CO3:</b> Study different types of multivibrator and wave form generator using IC555. Understand concept of memories and types of memories <b>CO4:</b> Understand the basic architecture of 8-bit microprocessors and 16 bit microprocessor. Identify the addressing modes of an instruction.</p>	<p><b>CO1:</b> Design and analyze the basic operations of MOSFET. Know the concept of feedback amplifier and their characteristics. Design the different oscillator circuits for various frequencies <b>CO2:</b> Understand and analyze the IC 741 operational amplifier and its characteristics. <b>CO3:</b> Study different types of multi vibrator and wave form generator using IC555. Understand concept of memories and types of memories <b>CO4:</b> Understand the basic architecture of 8-bit microprocessors and 16 bit microprocessor. Develop programming skills in assembly language. Able to write programs on 8085 microprocessor based systems</p>
9	Descriptive statistics-II and Continuous probability distributions and Testing of Hypothesis	GEC-1302 B	2018-19	<p><b>CO1:</b> Relation between two and three variables, Fitting of simple and multiple regression equations. <b>CO2:</b> Finding of probabilities of various distributions <b>CO3:</b> Knowing the relations among the different distributions with real life situations and Simulation of various distributions. <b>CO4:</b> Applying the small sample and large sample tests in various situations</p>	<p><b>CO1:</b> Relation between two and three variables, Fitting of simple and multiple regression equations. <b>CO2:</b> Finding of probabilities of various distributions <b>CO3:</b> Knowing the relations among the different distributions with real life situations and Simulation of various distributions. <b>CO4:</b> Applying the small sample and large sample tests in various situations</p>	<p><b>CO1:</b> Relation between two and three variables, Fitting of simple and multiple regression equations. <b>CO2:</b> Finding of probabilities of various distributions <b>CO3:</b> Knowing the relations among the different distributions with real life situations and Simulation of various distributions. <b>CO4:</b> Applying the small sample and large sample tests in various situations</p>
10	Computer Science	CC-CS-1303B	2018-19	<p><b>CO1:</b> Understand Basic elements of a communication system, Data Transmission modes, Data Transmission media, Types of networking Network Topologies, Concept of pointers <b>CO2:</b> Understand Information Technology IT Assets and its managements, IT Act, Definition, declaration, prototype of function,</p>	<p><b>CO1:</b> Understand Basic elements of a communication system, Data Transmission modes, Data Transmission media, Types of networking Network Topologies, Concept of pointers <b>CO2:</b> Understand Information Technology IT Assets and its managements, IT Act, Definition, declaration, prototype of function, Local and global variable,</p>	<p><b>CO1:</b> Understand Basic elements of a communication system, Data Transmission modes, Data Transmission media, Types of networking Network Topologies. Concept of pointer Dynamic memory allocation. <b>CO2:</b> Understand Information Technology IT Assets and its managements, IT Act, Definition, declaration, prototype of function, Local and global variable, User defined functions, Storage classes, <b>CO3:</b> Understand</p>



				Local and global variable, User defined functions, Storage classes, Recursion, Pointer and function, Call by value and Call by reference <b>CO3:</b> Understand Database Management System, Data Models, Concept of RDBMS, RDBMS Terminologies, DBA & Responsibilities of DBA, Relational Model, Concept of structure and union <b>CO4:</b> Understand Oracle Data types, Classification of SQL commands, Data Constraints, Concept of File, Text and binary files, Opening and closing files, File opening mode	User defined functions, Storage classes, <b>CO3:</b> Understand Database Management System, Data Models, Concept of RDBMS, RDBMS Terminologies, DBA & Responsibilities of DBA, concept of structures and union <b>CO4:</b> Understand Oracle Data types, Classification of SQL commands, Data Constraints, Concept of File, Text and binary files, Opening and closing files, File opening mode	Database Management System, Data Models, Concept of RDBMS, Concept of structure Definition of Union and declaration, Difference between structure and union <b>CO4:</b> Understand Oracle Data types, Classification of SQL commands, Data Constraints, Concept of File, Text and binary files, Opening and closing files, File opening mode
11	SEM-III Linear algebra & Numerical methods	GEC - 1300C	2019-20	<b>CO 1:</b> To make use of computational techniques & algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues & eigenvectors, orthogonality & diagonalization. <b>CO 2:</b> To make use of visualization, spatial reasoning, as well as geometric properties & strategies to model, solve problems & view solutions especially in $R^2$ & $R^3$ as well as conceptually extend these results to higher dimensions. <b>CO 3:</b> To critically analyze & construct mathematical arguments that relate to the study of introductory linear algebra, explain methods of numerical integration, numerical solutions of ordinary differential equations. Illustrate numerical solutions of non-linear equations. <b>CO4:</b> To apply numerical	<b>CO 1:</b> To make use of computational techniques & algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues & eigenvectors, orthogonality & diagonalization. <b>CO 2:</b> To make use of visualization, spatial reasoning, as well as geometric properties & strategies to model, solve problems & view solutions especially in $R^2$ & $R^3$ as well as conceptually extend these results to higher dimensions. <b>CO 3:</b> To critically analyze & construct mathematical arguments that relate to the study of introductory linear algebra, explain methods of numerical integration, numerical solutions of ordinary differential equations. Illustrate numerical solutions of non-linear equations. <b>CO4:</b> To apply numerical analysis which has enormous	<b>CO 1:</b> To make use of computational techniques & algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues & eigenvectors, orthogonality & diagonalization. <b>CO 2:</b> To make use of visualization, spatial reasoning, as well as geometric properties & strategies to model, solve problems & view solutions especially in $R^2$ & $R^3$ as well as conceptually extend these results to higher dimensions. <b>CO 3:</b> To critically analyze & construct mathematical arguments that relate to the study of introductory linear algebra, explain methods of numerical integration, numerical solutions of ordinary differential equations. Illustrate numerical solutions of non-linear equations. <b>CO4:</b> To apply numerical analysis which has enormous application in the field of science and some fields of engineering. Demonstrate the finite precision computation



				analysis which has enormous application in the field of science and some fields of engineering. Demonstrate the finite precision computation	application in the field of science and some fields of engineering. Demonstrate the finite precision computation	
12	Computer Instrumentation And Organization, Processor	GEC-1301 C	2019-20	<p><b>CO 1:</b> To explain principle of operation for various sensors. <b>CO 2:</b> To select appropriate instrument for the measurement of electrical parameter professionally. Design Digital to Analog Converters (DAC) and Analog to Digital Converters (ADC). <b>CO 3:</b> To understand the basic structure of computer organization <b>CO4:</b> To use instructions for different addressing modes and construct an assembly language programs for given task using assemble</p>	<p><b>CO 1:</b> To explain principle of operation for various sensors. Describe functional blocks of different types of Digital instruments and data acquisition system. <b>CO 2:</b> To select appropriate instrument for the measurement of electrical parameter professionally. <b>CO 3:</b> To understand the basic structure of computer organization <b>CO4:</b> To use instructions for different addressing modes and construct an assembly language programs for given task using assemble</p>	<p><b>CO 1:</b> To explain principle of operation for various sensors. Describe functional blocks of different types of Digital instruments and data acquisition system. <b>CO 2:</b> To select appropriate instrument for the measurement of electrical parameter professionally. Design Digital to Analog Converters (DAC) and Analog to Digital Converters (ADC). <b>CO 3:</b> To understand the basic structure of computer organization <b>CO4:</b> To use instructions for different addressing modes and construct an assembly language programs for given task using assemble</p>
13	Introduction to RDBMS using MySQL and Object Oriented Programming Using C++	CC-CS-1304C	2019-20	<p><b>CO 1:</b> To draw DFD, ERD, create relational database using normalization and to understand MySQL basics, classify DDL, DML, DCL commands and data constraints, implement SQL operators and functions, build C++ program structure, memory management operators, this pointer and reference variable, default argument, function overloading and explain Object Oriented Programming Concepts. <b>CO 2:</b> To implement programs in C++ using control structures, inline function, explain class, access modifiers and define</p>	<p><b>CO 1:</b> To draw DFD, ERD, create relational database using normalization and to understand MySQL basics, classify DDL, DML, DCL commands and data constraints, implement SQL operators and functions, build C++ program structure, memory management operators, this pointer and reference variable, default argument, function overloading and explain Object Oriented Programming Concepts. <b>CO 2:</b> To implement programs in C++ using control structures, inline function, explain class, access modifiers and define member functions of a class,</p>	<p><b>CO 1:</b> To draw DFD, ERD, create relational database using normalization and to understand MySQL basics, classify DDL, DML, DCL commands and data constraints, implement SQL operators and functions, build C++ program structure, memory management operators, this pointer and reference variable, default argument, function overloading and explain Object Oriented Programming Concepts. <b>CO 2:</b> To implement programs in C++ using control structures, inline function, explain class, access modifiers and define member functions of a class, static data members and member function, develop the programs using array of object, friend function and friend class. <b>CO 3:</b> To define a constructor,</p>



				<p>member functions of a class, static data members and member function, develop the programs using array of object, friend function and friend class. <b>CO 3:</b> To define a constructor, destructor and explain features of constructor, destructor and types of constructor, explain rules for operator overloading <b>CO4:</b> To explain inheritance and define Base class and derived class and implement programs using types of inheritance, define polymorphism and explain types of polymorphism and implement programs using virtual function.</p>	<p>static data members and member function, develop the programs using array of object, friend function and friend class. <b>CO 3:</b> To define a constructor, destructor and explain features of constructor, destructor and types of constructor, explain rules for operator overloading <b>CO4:</b> To explain inheritance and define Base class and derived class and implement programs using types of inheritance, define polymorphism and explain types of polymorphism and implement programs using virtual function.</p>	<p>destructor and explain features of constructor, destructor and types of constructor, explain rules for operator overloading <b>CO4:</b> To explain inheritance and define Base class and derived class and implement programs using types of inheritance, define polymorphism and explain types of polymorphism and implement programs using virtual function.</p>
14	SEM IV Computational Geometry & Operations research	GEC – 1300D	2019-20	<p><b>CO 1:</b> To demonstrate knowledge of key notions &amp; principles related to computational geometry. <b>CO 2:</b> To identify familiarity with some of the basic algorithmic techniques of the area. To develop operational research from the verbal description of the real world system. <b>CO 3:</b> To formulate and solve the mathematical models (linear programming problems) for physical situations like production, distribution of goods and economics. <b>CO4:</b> To solve the problems of transporting of products from origin to destinations with least transportation cost. Identify the resources required for projects and generate plan and work schedule.</p>	<p><b>CO 1:</b> Experiment with the central problems in the area &amp; the various approaches to tackling. <b>CO 2:</b> To identify familiarity with some of the basic algorithmic techniques of the area. Elaborate acquaintance with modern research in the field. <b>CO 3:</b> To formulate and solve the mathematical models (linear programming problems) for physical situations like production, distribution of goods and economics. <b>CO4:</b> To solve the problems of transporting of products from origin to destinations with least transportation cost.</p>	<p><b>CO 1:</b> To demonstrate knowledge of key notions &amp; principles related to computational geometry. Experiment with the central problems in the area &amp; the various approaches to tackling. <b>CO 2:</b> Elaborate acquaintance with modern research in the field. To develop operational research from the verbal description of the real world system. <b>CO 3:</b> To formulate and solve the mathematical models (linear programming problems) for physical situations like production, distribution of goods and economics. <b>CO4:</b> To solve the problems of transporting of products from origin to destinations with least transportation cost. Identify the resources required for projects and generate plan and work schedule.</p>



15	Communication Principles AND 8051 Microcontroller Interfacing, Programming	GEC-1301 D	2019-20	<p><b>CO 1:</b> To understand different blocks in communication system and how noise affects communication using different parameters. <b>CO 2:</b> To differentiate between different pulse modulation and demodulation techniques.. <b>CO 3:</b> To compare personal area network (PAN) technologies such as RFID Zigbee, Bluetooth and Wi-Fi. To draw and describe architecture of 8051 microcontroller. <b>CO4:</b> Write assembly language program for microcontrollers. Design microcontroller based system for various applications.</p>	<p><b>CO 1:</b> To understand different blocks in communication system and how noise affects communication using different parameters. <b>CO 2:</b> To differentiate between different pulse modulation and demodulation techniques <b>CO 3:</b> To compare personal area network (PAN) technologies such as RFID Zigbee, Bluetooth and Wi-Fi.. Understand the facilities of 8051 microcontroller. <b>CO4:</b> To understand interfacing various peripheral devices to the microcontrollers.</p>	<p><b>CO 1:</b> To understand different blocks in communication system and how noise affects communication using different parameters. <b>CO 2:</b> To differentiate between different pulse modulation and demodulation techniques <b>CO 3:</b> To compare personal area network (PAN) technologies such as RFID Zigbee, Bluetooth and Wi-Fi. To draw and describe architecture of 8051 microcontroller.. <b>CO4:</b> To understand interfacing various peripheral devices to the microcontrollers.. Design microcontroller based system for various applications.</p>
16	Introduction to Data Structure Using C++ and Cyber Security	CC-CS-1304D	2019-20	<p><b>CO 1:</b> To define Data Type, Data structure, Data object and explain Abstract Data Type, Linear and nonlinear data structures, explain Algorithm efficiency, array, types of array and sparse matrices, <b>CO 2:</b> To define Stack and demonstrate operations and static implementation of stack, explain applications of stack. To define queue and demonstrate operations and static implementation of queue and explain types of queues, explain Linked list and types of linked list. <b>CO 3:</b> To implement Stack and Queue using Linked list, define Tree and explain tree terminologies and tree traversal. To implement programs using searching and sorting techniques. <b>CO4:</b> To explain working of computer network and importance of cyber</p>	<p><b>CO 1:</b> To define Data Type, Data structure, Data object and explain Abstract Data Type, Linear and nonlinear data structures, explain Algorithm efficiency, array, types of array and sparse matrices, <b>CO 2:</b> To define Stack and demonstrate operations and static implementation of stack, explain applications of stack. To define queue and demonstrate operations and static implementation of queue and explain types of queues, explain Linked list and types of linked list. <b>CO 3:</b> To implement Stack and Queue using Linked list, define Tree and explain tree terminologies and tree traversal. To implement programs using searching and sorting techniques. <b>CO4:</b> To explain working of computer network and importance of cyber security,</p>	<p><b>CO 1:</b> To define Data Type, Data structure, Data object and explain Abstract Data Type, Linear and nonlinear data structures, explain Algorithm efficiency, array, types of array and sparse matrices. <b>CO 2:</b> To define Stack and demonstrate operations and static implementation of stack, explain applications of stack. To define queue and demonstrate operations and static implementation of queue and explain types of queues, explain Linked list and types of linked list. <b>CO 3:</b> To implement Stack and Queue using Linked list, define Tree and explain tree terminologies and tree traversal. To implement programs using searching and sorting techniques. <b>CO4:</b> To explain working of computer network and importance of cyber security, understand different security threats and information security management, explain access controls methods and wireless network security, understand cyber security laws and importance of security audit</p>





				security, understand different security threats and information security management, explain access controls methods and wireless network security, understand cyber security laws and importance of security audit	understand different security threats and information security management, explain access controls methods and wireless network security, understand cyber security laws and importance of security audit	
17	SEM-V Core Java and Operating system	DSC- 1305E	2020-2021	<p><b>CO 1:</b> To understand structure of java program, jvm, type conversion. Explain and implements programs in java using control statements, method overloading, constructors, array of objects, keywords this and static. <b>CO 2:</b> To write program on inheritance, package, abstract class and interfaces, Implement multithreading in object oriented programs. Understand concept of checked and unchecked exception and write exception handling programs. <b>CO 3:</b> To tell what is an operating system, its objectives and functions. To classify types of operating system and explain operating system services. <b>CO 4:</b> To explain protection, system calls, system programs and application programs. To understand the concept of process management, memory management and file management and deadlocks</p>	<p><b>CO 1:</b> To understand structure of java program, jvm, type conversion. Explain and implements programs in java using control statements, method overloading, constructors, array of objects, keywords this and static. <b>CO 2:</b> To write program on inheritance, package, abstract class and interfaces, Implement multithreading in object oriented programs. Understand concept of checked and unchecked exception and write exception handling programs. <b>CO 3:</b> To tell what is an operating system, its objectives and functions. To classify types of operating system and explain operating system services. <b>CO 4:</b> To explain protection, system calls, system programs and application programs. To understand the concept of process management, memory management and file management and deadlocks</p>	<p><b>CO 1:</b> To understand structure of java program, jvm, type conversion. Explain and implements programs in java using control statements, method overloading, constructors, array of objects, keywords this and static. <b>CO 2:</b> To write program on inheritance, package, abstract class and interfaces, Implement multithreading in object oriented programs. Understand concept of checked and unchecked exception and write exception handling programs. <b>CO 3:</b> To tell what is an operating system, its objectives and functions. To classify types of operating system and explain operating system services. <b>CO 4:</b> To explain protection, system calls, system programs and application programs. To understand the concept of process management, memory management and file management and deadlocks</p>
18	Data communication and Software Engineering	DSC- 1306E	2020-2021	<p><b>CO 1:</b> To understand the fundamental concept and components of Data Communication system. To explain Concept of network, advantages and disadvantages, categories and architectures of network. To explain</p>	<p><b>CO 1:</b> To understand the fundamental concept and components of Data Communication system. To explain Concept of network, advantages and disadvantages, categories and architectures of network. To explain</p>	<p><b>CO 1:</b> To understand the fundamental concept and components of Data Communication system. To explain Concept of network, advantages and disadvantages, categories and architectures of network. To explain types of transmission media and types of transmission modes. Understand</p>





	with UML			<p>types of transmission media and types of transmission modes. Understand multiplexing and switching techniques. Explain network devices, protocols and elements of protocol and standards. <b>CO 2:</b> To understand functions of physical layer, digital to analog conversion methods, analog to digital conversion methods. Understand Data link layer design issues, Framing, Error detection, and Error correction and flow control. To understand the basics of software and software engineering. To learn what is system's development life cycle <b>CO 3:</b> To learn and understand what are traditional and latest process models, learn and know what agile development is. To learn different fact finding techniques, which serve as a basis for requirements analysis and gathering, understand the importance of SRS in s/w development. <b>CO 4:</b> To study use of Unified modeling language. To learn how to draw UML diagram. To understand and learn to select suitable UML diagram for our software system. To understand the basics of software testing</p>	<p>types of transmission media and types of transmission modes. Understand multiplexing and switching techniques. Explain network devices, protocols and elements of protocol and standards. <b>CO 2:</b> To understand functions of physical layer, digital to analog conversion methods, analog to digital conversion methods. Understand Data link layer design issues. Framing, Error detection, and Error correction and flow control. To understand the basics of software and software engineering. To learn what is system's development life cycle <b>CO 3:</b> To learn and understand what are traditional and latest process models, learn and know what agile development is. To learn different fact finding techniques, which serve as a basis for requirements analysis and gathering, understand the importance of SRS in s/w development. <b>CO 4:</b> To study use of Unified modeling language. To learn how to draw UML diagram. To understand and learn to select suitable UML diagram for our software system. To understand the basics of software testing</p>	<p>multiplexing and switching techniques. Explain network devices, protocols and elements of protocol and standards. <b>CO 2:</b> To understand functions of physical layer, digital to analog conversion methods, analog to digital conversion methods. Understand Data link layer design issues, Framing, Error detection, and Error correction and flow control. To understand the basics of software and software engineering. To learn what is system's development life cycle <b>CO 3:</b> To learn and understand what are traditional and latest process models, learn and know what agile development is. To learn different fact finding techniques, which serve as a basis for requirements analysis and gathering, understand the importance of SRS in s/w development. <b>CO 4:</b> To study use of Unified modeling language. To learn how to draw UML diagram. To understand and learn to select suitable UML diagram for our software system. To understand the basics of software testing</p>
19	Vb.net and E-Commerce	DSC-1307 E	2020-2021	<p><b>CO 1:</b> To understand the Event driven &amp; sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector &amp; JIT Compilers <b>CO</b></p>	<p><b>CO 1:</b> To understand the Event driven &amp; sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector &amp; JIT Compilers <b>CO</b></p>	<p><b>CO 1:</b> To understand the Event driven &amp; sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector &amp; JIT Compilers <b>CO 2:</b> To understand data types, operators,</p>

				<p><b>2:</b> To understand data types, operators, conditional, unconditional &amp; looping statements. To understand how to write function &amp; procedures Understand class, object, &amp; OOP concepts. <b>CO3:</b> To understand different controls in window application, events &amp; properties of controls, the process of Electronic commerce and Business strategy involved in it and security concerns while doing online businesses. <b>CO4:</b> To appreciate ethical implications of professional practice. Be aware of global perspectives. Analyze features of existing e-commerce businesses, and propose future directions or innovations for specific businesses</p>	<p><b>2:</b> To understand data types, operators, conditional, unconditional &amp; looping statements. To understand how to write function &amp; procedures Understand class, object, &amp; OOP concepts. <b>CO3:</b> To understand different controls in window application, events &amp; properties of controls, the process of Electronic commerce and Business strategy involved in it and security concerns while doing online businesses. <b>CO4:</b> To appreciate ethical implications of professional practice. Be aware of global perspectives. Analyze features of existing e-commerce businesses, and propose future directions or innovations for specific businesses</p>	<p>conditional, unconditional &amp; looping statements. To understand how to write function &amp; procedures Understand class, object, &amp; OOP concepts. <b>CO3:</b> To understand different controls in window application, events &amp; properties of controls, the process of Electronic commerce and Business strategy involved in it and security concerns while doing online businesses. <b>CO4:</b> To appreciate ethical implications of professional practice. Be aware of global perspectives. Analyze features of existing e-commerce businesses, and propose future directions or innovations for specific businesses</p>
20	PHP programming	SEC-III	2020-2021	<p><b>CO 1 :</b> Get basic knowledge of PHP programming . <b>CO 3 :</b> Get the basic knowledge of data bases using for web programming.</p>	<p><b>CO 2 :</b> To implement functions , strings , arrays and objects .</p>	<p><b>CO 4 :</b> To earns skill set to develop online information system using the open source PHP.</p>
21	SEM VI Advanced Java and Data warehousing and mining	DSE-1305 F	2020-2021	<p><b>CO 1:</b> To create a full set of UI Widgets using Abstract Windowing Toolkit (AWT) &amp; Swings. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).Create dynamic web pages using Servlets <b>CO 2:</b> To</p>	<p><b>CO 1:</b> To create a full set of UI Widgets using Abstract Windowing Toolkit (AWT) &amp; Swings. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).Create dynamic web pages using Servlets <b>CO 2:</b> To</p>	<p><b>CO 1:</b> To create a full set of UI Widgets using Abstract Windowing Toolkit (AWT) &amp; Swings. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).Create dynamic web pages using Servlets <b>CO 2:</b> To create dynamic web pages using JSP.To understand Data Warehousing.</p>



				<p>create dynamic web pages using JSP.To understand Data Warehousing, Working of data warehouse, Data Warehouse applications.To understand types of data Warehouse, Difference between Data Warehouse (OLAP) and Operational Database (OLTP). <b>CO 3:</b> To understand and explain concept of data mining, Process of knowledge discovery in databases (KDD). <b>CO 4:</b> To explain major tasks in Data Preprocessing. To understand market basket analysis and explain Apriori algorithm. To understand concept of Classification.</p>	<p>create dynamic web pages using JSP.To understand Data Warehousing, Working of data warehouse, Data Warehouse applications.To understand types of data Warehouse, Difference between Data Warehouse (OLAP) and Operational Database (OLTP). <b>CO 3:</b> To understand and explain concept of data mining, Process of knowledge discovery in databases (KDD). <b>CO 4:</b> To explain major tasks in Data Preprocessing.To understand market basket analysis and explain Apriori algorithm.</p>	<p>Working of data warehouse, Data Warehouse applications.To understand types of data Warehouse, Difference between Data Warehouse (OLAP) and Operational Database (OLTP). <b>CO 3:</b> To understand and explain concept of data mining, Process of knowledge discovery in databases (KDD). <b>CO 4:</b> To explain major tasks in Data Preprocessing.To understand market basket analysis and explain Apriori algorithm. To understand concept of Classification.</p>
22	Computer Networks and C# and introduction to ASP.Net	DSE-1306 F	2020-2021	<p><b>CO 1:</b> To understand Flow control protocols-Sliding window protocol, One bit sliding window protocol, protocol using go back N, Protocol using selective repeat. Explain design issues, concept of routing, routing algorithms and Congestion Control algorithms. <b>CO 2:</b> To explain transport layer service primitives, TCP, UDP protocol.Understand session layer services, Remote Procedure Call(RPC), Presentation layer services, Concept of cryptography and types of</p>	<p><b>CO 1:</b> To understand Flow control protocols-Sliding window protocol, One bit sliding window protocol, protocol using go back N, Protocol using selective repeat. Explain design issues, concept of routing, routing algorithms and Congestion Control algorithms. <b>CO 2:</b> To explain transport layer service primitives, TCP, UDP protocol.Understand session layer services, Remote Procedure Call(RPC), Presentation layer services, Concept of cryptography and types of</p>	<p><b>CO 1:</b> To understand Flow control protocols-Sliding window protocol, One bit sliding window protocol, protocol using go back N, Protocol using selective repeat. Explain design issues, concept of routing, routing algorithms and Congestion Control algorithms. <b>CO 2:</b> To explain transport layer service primitives, TCP, UDP protocol.Understand session layer services, Remote Procedure Call(RPC), Presentation layer services, Concept of cryptography and types of cryptography.To explain Functions of application layer. application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. <b>CO 3:</b> To explain Functions of application layer,</p>



				<p>cryptography. To explain Functions of application layer, application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. <b>CO 3:</b> To explain Functions of application layer, application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. To get knowledge different types of errors, structured &amp; unstructured exception, to understand how to trace errors. <b>CO 4:</b> To understand database connection, connected &amp; disconnected architecture, data binding to controls, data validations. Understand &amp; Generate Reports from database using crystal report Get Basic introduction to ASP.net, understand different ASP.net controls, understand concepts of Master Page</p>	<p>application layer, application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. <b>CO 3:</b> To explain Functions of application layer, application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. To get knowledge different types of errors, structured &amp; unstructured exception, to understand how to trace errors. <b>CO 4:</b> To understand database connection, connected &amp; disconnected architecture, data binding to controls, data validations. Understand &amp; Generate Reports from database using crystal report Get Basic introduction to ASP.net, understand different ASP.net controls, understand concepts of Master Page</p>	<p>application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. To get knowledge different types of errors, structured &amp; unstructured exception, to understand how to trace errors. <b>CO 4:</b> To understand database connection, connected &amp; disconnected architecture, data binding to controls, data validations. Understand &amp; Generate Reports from database using crystal report Get Basic introduction to ASP.net, understand different ASP.net controls, understand concepts of Master Page</p>
23	Linux OS and Artificial intelligence and Expert system	DSE-1307 F	2020-2021	<p><b>CO 1:</b> To understand the linux basics- shell, kernel, general purpose utilities, directory handling commands, file handling commands  <b>CO 2:</b> To implement basic filters, understand environment variables.  <b>CO 3:</b> To use VI editor and its different commands. To write shell scripts and run them  <b>CO 4:</b> To write</p>	<p><b>CO 1:</b> To understand the linux basics- shell, kernel, general purpose utilities, directory handling commands, file handling commands  <b>CO 2:</b> To implement basic filters, understand environment variables.  <b>CO 3:</b> To use VI editor and its different commands. To write shell scripts and run them  <b>CO 4:</b> To write shell scripts using different</p>	<p><b>CO 1:</b> To understand the linux basics- shell, kernel, general purpose utilities, directory handling commands, file handling commands  <b>CO 2:</b> To implement basic filters, understand environment variables.  <b>CO 3:</b> To use VI editor and its different commands. To write shell scripts and run them  <b>CO 4:</b> To write shell scripts using different conditional and looping statements</p>



				shell scripts using different conditional and looping statements	conditional and looping statements	
24	Android Programming	SEC-III	2020-2021	<p><b>CO1:</b> To understand the Event driven &amp; sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector &amp; JIT Compilers</p> <p><b>CO2:</b> Understand data types, operators, conditional, unconditional &amp; looping statements. To understand how to write function &amp; procedures</p> <p><b>CO3:</b> Understand class, object, &amp; OOP concepts</p> <p><b>CO4:</b> Understand different controls in window application, events &amp; properties of controls.</p>	<p><b>CO1:</b> To understand the Event driven &amp; sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector &amp; JIT Compilers</p> <p><b>CO2:</b> Understand data types, operators, conditional, unconditional &amp; looping statements. To understand how to write function &amp; procedures</p> <p><b>CO3:</b> Understand class, object, &amp; OOP concepts</p> <p><b>CO4:</b> Understand different controls in window application, events &amp; properties of controls.</p>	<p><b>CO1:</b> To understand the Event driven &amp; sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector &amp; JIT Compilers</p> <p><b>CO2:</b> Understand data types, operators, conditional, unconditional &amp; looping statements. To understand how to write function &amp; procedures</p> <p><b>CO3:</b> Understand class, object, &amp; OOP concepts</p> <p><b>CO4:</b> Understand different controls in window application, events &amp; properties of controls.</p>
25	SEM - I English for Business Communication	AEC C-A	2021-22	<p><b>CO1:</b> To understand the concept, process and importance of communication. <b>CO2:</b> To gain knowledge of media of communication. <b>CO3:</b> To develop skills of effective communication - both written and oral. <b>CO4:</b> To make students familiar with information technology</p>	<p><b>CO1:</b> To understand the concept, process and importance of communication. <b>CO2:</b> To gain knowledge of media of communication. <b>CO3:</b> To develop skills of effective communication - both written and oral. <b>CO4:</b> To make students familiar with information technology</p>	<p><b>CO1:</b> To understand the concept, process and importance of communication. <b>CO2:</b> To gain knowledge of media of communication. <b>CO3:</b> To develop skills of effective communication - both written and oral. <b>CO4:</b> To make students familiar with information technology</p>
26	Mathematics- Discrete Mathematics & Algebra	GEC-1300 A	2021-22	<p><b>CO1:</b> Construct simple mathematical proofs and possess the ability to verify them. Comprehend formal logical arguments. <b>CO2:</b> Apply basic</p>	<p><b>CO1:</b> Construct simple mathematical proofs and possess the ability to verify them. Comprehend formal logical arguments. <b>CO2:</b> Apply basic</p>	<p><b>CO1:</b> Construct simple mathematical proofs and possess the ability to verify them. Comprehend formal logical arguments. <b>CO2:</b> Apply basic counting techniques of combinatorial problems.</p>



	Theory			counting techniques of combinatorial problems <b>CO3:</b> Classify numbers into number sets. Determine function is one-one and Onto. <b>CO4:</b> Prove results involving divisibility & greatest common divisors.	counting techniques of combinatorial problems.. <b>CO3:</b> Classify numbers into number sets. Determine function is one-one and Onto. <b>CO4:</b> Prove results involving divisibility & greatest common divisors. Apply	<b>CO3:</b> Classify numbers into number sets. Determine function is one-one and Onto. <b>CO4:</b> Prove results involving divisibility & greatest common divisors.
27	Electronics	GEC-1301 A	2021-22	<b>CO1:</b> Study the current voltage characteristics of semiconductor devices, understand the behavior of basic electronic components, Explain the concept of circuit laws and network theorems and apply them to laboratory measurements <b>CO2:</b> Understand to semiconductor devices. Characteristics and biasing of diodes and transistors. Design and analysis of circuits using diodes, bipolar transistors, and field effect transistors. Application of transistors as amplifiers and switches. <b>CO3:</b> Understand basic digital electronic systems. To learn different theorems and laws for simplification of basic Digital electronics circuits. understand symbols, Truth tables, Boolean equations, & working principle <b>CO4:</b> Teach basic principles of programming. Develop skills for writing programs using 'C'.	<b>CO1:</b> Study the current voltage characteristics of semiconductor devices, understand the behavior of basic electronic components, Explain the concept of circuit laws and network theorems and apply them to laboratory measurements <b>CO2:</b> Understand to semiconductor devices. Characteristics and biasing of diodes and transistors. Design and analysis of circuits using diodes, bipolar transistors, and field effect transistors. Application of transistors as amplifiers and switches. <b>CO3:</b> Understand basic digital electronic systems. To learn different theorems and laws for simplification of basic Digital electronics circuits. understand symbols, Truth tables, Boolean equations, & working principle <b>CO4:</b> Teach basic principles of programming. Develop skills for writing programs using 'C'.	<b>CO1:</b> Study the current voltage characteristics of semiconductor devices, understand the behavior of basic electronic components, Explain the concept of circuit laws and network theorems and apply them to laboratory measurements <b>CO2:</b> Understand to semiconductor devices. Characteristics and biasing of diodes and transistors. Design and analysis of circuits using diodes, bipolar transistors, and field effect transistors. Application of transistors as amplifiers and switches. <b>CO3:</b> Understand basic digital electronic systems. To learn different theorems and laws for simplification of basic Digital electronics circuits. understand symbols, Truth tables, Boolean equations, & working principle <b>CO4:</b> Teach basic principles of programming. Develop skills for writing programs using 'C'.
28	Descriptive statistics-I and Discrete probability distributions	GEC-1302 A	2021-22	<b>CO1:</b> To classify, tabulate and represent the data graphically. <b>CO2:</b> To compute and interpret various measures of central tendency, dispersion, moments, skewness and kurtosis. <b>CO3:</b> To compute	<b>CO1:</b> To classify, tabulate and represent the data graphically. <b>CO2:</b> To compute and interpret various measures of central tendency, dispersion, moments, skewness and kurtosis. <b>CO3:</b> To compute	<b>CO1:</b> To classify, tabulate and represent the data graphically. <b>CO2:</b> To compute and interpret various measures of central tendency, dispersion, moments, skewness and kurtosis. <b>CO3:</b> To compute probabilities by using definition and probability rules. <b>CO4:</b> To compute probabilities



				probabilities by using definition and probability rules. <b>CO4:</b> To compute probabilities by using discrete probability distributions.	probabilities by using definition and probability rules. <b>CO4:</b> To compute probabilities by using discrete probability distributions.	by using discrete probability distributions.
29	Computer Science	CC-CS-1303 A	2021-22	<b>CO1:</b> To learn fundamental concepts of computers, inputs, outputs and operating systems.	<b>CO2:</b> To learn the principles of office automation, develop logic for problem solving. <b>CO4:</b> To develop skills for writing programs using 'C'.	<b>CO3:</b> To teach basic principles of programming. <b>CO4:</b> To develop skills for writing programs using 'C'.
30	Sem II English Communication Skills-II	AEC C-B	2021-22	<b>CO1:</b> To acquaint the students with employment communication—Writing Resume, Acquiring Interview Skills etc.. <b>CO2:</b> To introduce the students with the knowledge of office management <b>CO3:</b> To develop skills of effective communication - both written and oral <b>CO4:</b> To make students familiar with modern technology	<b>CO1:</b> To acquaint the students with employment communication—Writing Resume, Acquiring Interview Skills etc.. <b>CO2:</b> To introduce the students with the knowledge of office management <b>CO3:</b> To develop skills of effective communication - both written and oral <b>CO4:</b> To make students familiar with modern technology	<b>CO1:</b> To acquaint the students with employment communication—Writing Resume, Acquiring Interview Skills etc.. <b>CO2:</b> To introduce the students with the knowledge of office management <b>CO3:</b> To develop skills of effective communication - both written and oral <b>CO4:</b> To make students familiar with modern technology
31	Mathematics- Graph Theory & Calculas	GEC-1300 B	2021-22	<b>CO1:</b> Apply principles and concepts of graph theory in practical situations. <b>CO2:</b> To model real world problems using graph theory. To model real world problems using graph theory <b>CO3:</b> Inspect the value of the limit of a function at a point using the definition of the limit. <b>CO4:</b> Experiment with differentiation of exponential, logarithmic, trigonometric & inverse trigonometric functions n times.	<b>CO1:</b> Apply principles and concepts of graph theory in practical situations. <b>CO2:</b> To model real world problems using graph theory. To model real world problems using graph theory <b>CO3:</b> Inspect the value of the limit of a function at a point using the definition of the limit.. <b>CO4:</b> Experiment with differentiation of exponential, logarithmic, trigonometric & inverse trigonometric functions n times.	<b>CO1:</b> Apply principles and concepts of graph theory in practical situations. Understand applications of graph theory in areas of Computer Science, Biology, Chemistry, Physics, Sociology etc. <b>CO2:</b> To model real world problems using graph theory. To model real world problems using graph theory <b>CO3:</b> Inspect the value of the limit of a function at a point using the definition of the limit. <b>CO4:</b> Experiment with differentiation of exponential, logarithmic, trigonometric & inverse trigonometric functions n times





32	<b>Electronics : Analog electronics - II and Circuits-II</b>	GEC- 1301 B	2021-22	<b>CO1:</b> Design and analyze the basic operations of MOSFET. <b>CO2:</b> Understand and analyze the IC 741 operational amplifier and its characteristics. <b>CO3:</b> Study different types of multivibrator and wave form generator using IC555. Understand concept of memories and types of memories <b>CO4:</b> Understand the basic architecture of 8- bit microprocessors and 16 bit microprocessor. Identify the addressing modes of an instruction. Develop programming skills in assembly language.	<b>CO1:</b> Design and analyze the basic operations of MOSFET <b>CO2:</b> Understand and analyze the IC 741 operational amplifier and its characteristics <b>CO3:</b> Study different types of multivibrator and wave form generator using IC555. Understand concept of memories and types of memories <b>CO4:</b> Understand the basic architecture of 8- bit microprocessors and 16 bit microprocessor. Identify the addressing modes of an instruction. Develop programming skills in assembly language.	<b>CO1:</b> Design and analyze the basic operations of MOSFET. <b>CO2:</b> Understand and analyze the IC 741 operational amplifier and its characteristics. Understanding various operating modes of Op-amp and its linear/non-linear applications <b>CO3:</b> Study different types of multivibrator and wave form generator using IC555. Understand concept of memories and types of memories <b>CO4:</b> Understand the basic architecture of 8- bit microprocessors and 16 bit microprocessor. Identify the addressing modes of an instruction. Develop programming skills in assembly language.
33	<b>Statistics: Descriptive statistics-II</b>	GEC- 1302 B	2021-22	<b>CO1:</b> Relation between two and three variables, Fitting of simple and multiple regression equations. <b>CO2:</b> Finding of probabilities of various distributions <b>CO3:</b> Knowing the relations among the different distributions with real life situations and Simulation of various distributions. <b>CO4:</b> Applying the small sample and large sample tests in various situations	<b>CO1:</b> Relation between two and three variables, Fitting of simple and multiple regression equations. <b>CO2:</b> Finding of probabilities of various distributions <b>CO3:</b> Knowing the relations among the different distributions with real life situations and Simulation of various distributions. <b>CO4:</b> Applying the small sample and large sample tests in various situations	<b>CO1:</b> Relation between two and three variables, Fitting of simple and multiple regression equations. <b>CO2:</b> Finding of probabilities of various distributions <b>CO3:</b> Knowing the relations among the different distributions with real life situations and Simulation of various distributions. <b>CO4:</b> Applying the small sample and large sample tests in various situations
34	<b>Computer science: Introduction to computers and programmin g using C-II</b>	CC- CS- 1303 B	2021-22	<b>CO1:</b> To define the basics in web design, Visualize the basic concept of HTML.	<b>CO2:</b> To recognize the elements of HTML. Introduce basics concept of CSS.	<b>CO3:</b> To develop the concept of web publishing, know the concept of array and functions. <b>CO4:</b> To implement pointers and structures, know file handling



35	<b>SEM-III Maths: Linear algebra &amp; Numerical methods</b>	<b>GEC- 1300 C1 &amp; C2</b>	2022-23	<b>CO1:</b> To learn about matrices and solutions of system of linear equations	<b>CO2:</b> To learn different concepts related to vector spaces and linear transformations	<b>CO3:</b> To use appropriate numerical methods for solving algebraic and transcendental Equations. <b>CO4:</b> To study different interpolation methods for given tabulated data. use numerical methods for solving integration and ordinary differential equations
36	<b>Electronics: Instrumentat ion Computer organization</b>	<b>GEC- 1301 C1  GEC- 1301 C2</b>	2022-23	<b>CO1:</b> To describe the working principle, selection criteria and applications of various Transducers used in instrumentation systems.	<b>CO2:</b> To gain knowledge about different type of signal conditioning circuits, data converters and Understand construction, working principle of different types of digital instruments.	<b>CO3:</b> To explain the function of each element of a memory hierarchy and Learn about various data transfer techniques in digital computer and the I/O interfaces. <b>CO4:</b> To understand the basics of hardwired and micro-programmed control of the CPU, pipelined architectures and architecture of 8086 microprocessor.
37	<b>Computer: Introduction to RDBMS using MySQL OOP Using C++</b>	<b>CC- CS- 1303 C1 &amp; C2</b>	2022-23	<b>CO1:</b> To draw DFD, ERD, create relational database using normalization and to understand MySQL basics. classify DDL, DML, DCL commands and data constraints, implement SQL operators and functions, build C++ program structure, memory management operators, this pointer and reference variable.	<b>CO2:</b> To implement programs in C++ using control structures, inline function.default argument, function overloading and explain Object Oriented Programming Concepts. , explain class, access modifiers and define member functions of a class. static data members and member function, develop the programs using array of object.	<b>CO3:</b> To explain friend function and friend class, define a constructor, destructor and explain features of constructor, destructor and types of constructor, explain rules for operator overloading and implement programs using unary and binary operator overloading. <b>CO4:</b> To explain inheritance and define Base class and derived class and implement programs using types of inheritance. define polymorphism and explain types of polymorphism and implement programs using virtual function and explain concept of pure virtual function and abstract class
38	<b>SEC: Skill Enhancemen t course-I Introduction to SQLite</b>	<b>SEC- BCS D</b>	2022-23	<b>CO1:</b> Understand the basics of SQLite , able to create, open, drop database files.	<b>CO2:</b> Able to create tables, add and edit data using different constraints, operators, understand data selection and retrieval using clauses etc.	<b>CO3:</b> Able to process data using different SQLite functions <b>CO4:</b> Able to retrieve data using joins and has overview of Index, Trigger and views.



39	SEM-IV Maths: Computational Geometry Operation Research	GEC-1300 D1 GEC-1300 D2	2022-23	CO1:To study different types of two and three dimensional transformations	CO2:To learn different generation techniques of curves CO4:To use different methods for solving transportation and assignment problems, study different techniques for solving games	CO3:To formulate and apply suitable methods to solve linear programming problems
40	Electronics: 8051 programming, interfacing Raspberry Pi	GEC-1301 D1 GEC-1301 D2	2022-23	CO1:To understand the architecture of 8051 microcontroller and knowledge about assembly Language programs of 8051.	CO2:To build systems using microcontroller for real time applications. CO4:To understand Raspbian OS. Python programming and apply creative thinking skills in the design of practical solutions to specific case studies and projects.	CO3:To understand the working of Raspberry Pi. its features and how various components can be used with Pi.
41	Computer: Data structure using C++ Cyber security essentials	CC- CS- 1303 D1 & D2	2022-23	CO1:To define Data Type. Data structure.Data object and explain Abstract Data Type. Linear and nonlinear data structures, explain Algorithm efficiency, array, types of array and sparse matrices. CO4:To understand different security threats and information security management explain access controls methods and wireless network security, understand cyber security laws and importance of security audit.	CO2:To define Stack and demonstrate operations and static implementation of stack, explain applications of stack, define queue and demonstrate operations and static implementation of queue and explain types of queues, explain Linked list and types of linked list	CO3:To implement Stack and Queue using Linked list. define Tree and explain tree terminologies and tree traversal, implement programs using searching and sorting techniques, explain working of computer network and importance of cyber security



42	Skill Enhancement course-II Python Programming	SEC-BCS D	2022-23	CO1: To learn how to install Python, start the Python shell and to define the structure and components of a Python program.	CO2: To learn to perform basic calculations, print text on the screen and perform simple control flow operations using if statements and for loops.	CO3: To learn how to use lists, tuples, and dictionaries in Python programs. CO4: To learn how to reuse code with functions
43	EVS	AEC C-B	2022-23	CO1: To understand the Need for public awareness. Concept of sustainability. Sustainable development and its goals with Indian context.	CO2: To understand the concept of an ecosystem. Structure and function of an ecosystem. Producers,	CO3: To understand the consumers and decomposers. Energy flow in the ecosystem. Ecological succession



*P. Dessai*

(Miss. Pallavi M. Dessai)

**HEAD**  
**DEPARTMENT OF B.SC. COMPUTER SCIENCE**  
**(ENTIRE)**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(AUTONOMOUS)**