

|| Jai Sri Gurudev ||
Sri Adichunchanagiri Shikshana Trust®

**ADICHUNCHANAGIRI INSTITUTE OF TECHNOLOGY
JYOTHINAGAR, CHIKKAMAGALURU - 577 102**

(Affiliated to V.T.U. Belagavi, Approved by AICTE, New Delhi and Recognized by Govt. of Karnataka)
(Accredited by NAAC, NBA, ISO 9001: 2008 Certified)



DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

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Ref: AIT/IS&E/051/2018

Course Outcomes

2018

1 st / 2 nd Semester		
C Programming for problem solving	18CPS13/18CPS23	CO1: illustrate simple algorithms from the different domains such as mathematics, physics, etc. CO2: Construct a programming solution to the given problem using C. CO3: Identify and correct the syntax and logical errors in C programs. CO4: Modularize the given problem using functions and structures
C programming Laboratory	18CPL17/18CPL27	CO1: Write algorithms, flowcharts and program for simple problems. CO2: Correct syntax and logical errors to execute a program. CO3: Write iterative and wherever possible recursive programs. CO4: Demonstrate use of functions, arrays, strings, structures and pointers in problem solving.

Adichunchanagiri Institute of Technology
Department of Information Science & Engineering

Course Outcomes

3 rd Semester		
Subject	Subject Code	COs
Transform Calculus, Fourier Series And Numerical Techniques	18MAT31	<p>CO1: Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.</p> <p>CO2: Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.</p> <p>CO3: Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.</p> <p>CO4: Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.</p> <p>CO5: Determine the external of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.</p>
Data Structures And Applications	18CS32	<p>CO1: Use different types of data structures, operations and algorithms</p> <p>CO2: Apply searching and sorting operations on files</p> <p>CO3: Use stack, Queue, Lists, Trees and Graphs in problem solving</p> <p>CO4: Implement all data structures in a high-level language for problem solving.</p>
Analog And Digital Electronics	18CS33	<p>CO1: Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.</p> <p>CO2: Explain the basic principles of A/D and D/A conversion circuits and develop the same.</p> <p>CO3: Simplify digital circuits using Karnaugh Map , and Quine-McClusky Methods</p> <p>CO4: Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.</p> <p>CO5: Develop simple HDL programs</p>
Computer Organization	18CS34	<p>CO1: Explain the basic organization of a computer system.</p> <p>CO2: Demonstrate functioning of different sub systems, such as processor, Input/output, and memory.</p> <p>CO3: Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.</p> <p>CO4: Design and analyse simple arithmetic and logical units.</p>
Software Engineering	18CS35	<p>CO1: Design a software system, component, or process to meet desired needs within realistic constraints.</p> <p>CO2: Assess professional and ethical responsibility</p> <p>CO3: Function on multi-disciplinary teams</p> <p>CO4: Use the techniques, skills, and modern engineering tools</p>

		necessary for engineering practice CO5: Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems
Discrete Mathematical Structures	18CS36	CO1: Use propositional and predicate logic in knowledge representation and truth verification. CO2: Demonstrate the application of discrete structures in different fields of computer science. CO3: Solve problems using recurrence relations and generating functions. CO4: Application of different mathematical proofs techniques in proving theorems in the courses. CO5: Compare graphs, trees and their applications.
Analog And Digital Electronics Laboratory	18CSL37	CO1: Use appropriate design equations / methods to design the given circuit. CO2: Examine and verify the design of both analog and digital circuits using simulators. CO3: Make use of electronic components, ICs, instruments and tools for design and testing of circuits for the given the appropriate inputs. CO4: Compile a laboratory journal which includes; aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing, procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.
Data Structures Laboratory	18CSL38	CO1: Analyze and Compare various linear and non-linear data structures CO2: Code, debug and demonstrate the working nature of different types of data structures and their applications CO3: Implement, analyze and evaluate the searching and sorting algorithms CO4: Choose the appropriate data structure for solving real world problems
Constitution Of India, Professional Ethics And Cyber Law (CPC)	18CPC39/49	CO 1: Have constitutional knowledge and legal literacy. CO 2: Understand Engineering and Professional ethics and responsibilities of Engineers. CO 3: Understand the the cybercrimes and cyber laws for cyber safety measures.

4 th Semester		
Subject	Subject Code	COs
Complex Analysis, Probability And Statistical Methods	18MAT41	<p>CO1: Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.</p> <p>CO2: Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.</p> <p>CO3: Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.</p> <p>CO4: Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.</p> <p>Construct joint probability distributions and demonstrate the validity of testing the hypothesis</p>
Design And Analysis Of Algorithms	18CS42	<p>CO1: Describe computational solution to well known problems like searching, sorting etc.</p> <p>CO2: Estimate the computational complexity of different algorithms</p> <p>CO3: Devise an algorithm using appropriate design strategies for problem solving.</p>
Operating Systems	18CS43	<p>CO1: Demonstrate need for OS and different types of OS</p> <p>CO2: Apply suitable techniques for management of different resources</p> <p>CO3: Use processor, memory, storage and file system commands</p> <p>CO4: Realize the different concepts of OS in platform of usage through case studies</p>
Microcontroller and Embedded Systems	18CS44	<p>CO1: Describe the architectural features and instructions of ARM microcontroller</p> <p>CO2: Apply the knowledge gained for Programming ARM for different applications.</p> <p>CO3: Interface external devices and I/O with ARM microcontroller.</p> <p>CO4: Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.</p> <p>CO5: Develop the hardware /software co-design and firmware design approaches.</p> <p>CO6: Demonstrate the need of real time operating system for embedded system applications</p>
Object Oriented Concepts	18CS45	<p>CO1: Explain the object-oriented concepts and JAVA.</p> <p>CO2: Develop computer programs to solve real world problems in Java.</p> <p>CO3: Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.</p>
Data Communication	18CS46	<p>CO1: Explain the various components of data communication.</p> <p>CO2: Explain the fundamentals of digital communication and switching.</p> <p>CO3: Compare and contrast data link layer protocols.</p> <p>CO4: Summarize IEEE 802.xx standards</p>

Design And Analysis Of Algorithms Laboratory	18CSL47	<p>CO1: Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)</p> <p>CO2: Implement a variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.</p> <p>CO3: Analyze and compare the performance of algorithms using language features.</p> <p>CO4: Apply and implement learned algorithm design techniques and data structures to solve real-world problems.</p>
Microcontroller And Embedded Systems Laboratory	18CSL48	<p>CO1: Develop and test program using ARM7TDMI/LPC2148</p> <p>CO2: Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler</p>

5 th Semester		
Subject Code	Subject Code	COs
Management And Entrepreneurship For It Industry	18CS51	<p>CO1: Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship</p> <p>CO2: Utilize the resources available effectively through ERP</p> <p>CO3: Make use of IPRs and institutional support in entrepreneurship</p>
Computer Networks And Security	18CS52	<p>CO1: Explain principles of application layer protocols</p> <p>CO2: Recognize transport layer services and infer UDP and TCP protocols</p> <p>CO3: Classify routers, IP and Routing Algorithms in network layer</p> <p>CO4: Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard</p> <p>CO5: Describe Multimedia Networking and Network Management</p>
Database Management System	18CS53	<p>CO1: Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.</p> <p>CO2: Use Structured Query Language (SQL) for database manipulation.</p> <p>CO3: Design and build simple database systems</p> <p>CO4: Develop application to interact with databases.</p>
Automata Theory And Computability	18CS54	<p>CO1: Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation</p> <p>CO2: Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).</p> <p>CO3: Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.</p> <p>CO4: Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.</p> <p>CO5: Classify a problem with respect to different models of Computation.</p>

Application Development Using Python	18CS55	<p>CO1: Demonstrate proficiency in handling of loops and creation of functions</p> <p>CO2: Identify the methods to create and manipulate lists, tuples and dictionaries.</p> <p>CO3: Discover the commonly used operations involving regular expressions and file system.</p> <p>CO4: Interpret the concepts of Object-Oriented Programming as used in Python.</p> <p>CO5: Determine the need for scraping websites and working with CSV, JSON and other file formats</p>
UNIX Programming	18CS56	<p>CO1: Explain Unix Architecture, File system and use of Basic Commands</p> <p>CO2: Illustrate Shell Programming and to write Shell Scripts</p> <p>CO3: Describe the Unix system calls, The Unix Process and IPC</p> <p>CO4: Explain the significance of Unix signals</p>
Computer Network Laboratory	18CSL57	<p>CO1: Analyze and Compare various networking protocols.</p> <p>CO2: Demonstrate the working of different concepts of networking.</p> <p>CO3: Implement, analyze and evaluate networking protocols in NS2 / NS3 and JAVA programming language</p>
DBMS Laboratory With Mini Project	18CSL58	<p>CO1: Create, Update and query on the database</p> <p>CO2: Demonstrate the working of different concepts of DBMS</p> <p>CO3: Implement, analyze and evaluate the project developed for an application</p>
Environmental Studies	18CI59	<p>CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,</p> <p>CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.</p> <p>CO3: Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.</p> <p>CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues</p>


6 th Semester		
Subject Code	Subject Code	COs
File structures	18IS61	<p>CO1: Choose appropriate file structure for storage representation</p> <p>CO2: Identify a suitable sorting technique to arrange the data.</p> <p>CO3: Select suitable indexing and hashing techniques for better performance to a given problem.</p>
Software Testing	18IS62	<p>CO1: Derive test cases for any given problem</p> <p>CO2: Compare the different testing techniques</p> <p>CO3: Classify the problem into suitable testing model</p> <p>CO4: Apply the appropriate technique for the design of flow graph.</p> <p>CO5: Create appropriate document for the software artefact</p>

Web Technology And Its Applications	18CS63	<p>CO1: Adapt HTML and CSS syntax and semantics to build web pages.</p> <p>CO2: Construct and visually format tables and forms using HTML and CSS</p> <p>CO3: Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.</p> <p>CO4: Appraise the principles of object oriented development using PHP</p> <p>CO5: Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features</p>
Data Mining And Data Warehousing	18CS641	<p>CO1: Identify data mining problems and implement the data warehouse</p> <p>CO2: Write association rules for a given data pattern.</p> <p>CO3: Choose between classification and clustering solution</p>
Programming In Java (Open Elective)	18CS653	<p>CO1: Explain the object-oriented concepts and JAVA.</p> <p>CO2: Develop computer programs to solve real world problems in Java.</p> <p>CO3: Develop simple GUI interfaces for a computer program to interact with users</p>
Software Testing Laboratory	18CSL66	<p>CO1: List out the requirements for the given problem</p> <p>CO2: Design and implement the solution for given problem in any programming language(C,C++,JAVA)</p> <p>CO3: Derive test cases for any given problem</p> <p>CO4: Apply the appropriate technique for the design of flow graph.</p> <p>CO5: Create appropriate document for the software artefact</p>
File Structures Laboratory With Mini Project	18ISL67	<p>CO1: Implement operations related to files</p> <p>CO2: Apply the concepts of file system to produce the given application.</p> <p>CO3: Evaluate performance of various file systems on given parameters.</p>
Mobile Application Development	18CSMP68	<p>CO1: Create, test and debug Android application by setting up Android development environment.</p> <p>CO2: Implement adaptive, responsive user interfaces that work across a wide range of devices.</p> <p>CO3: Infer long running tasks and background work in Android applications.</p> <p>CO4: Demonstrate methods in storing, sharing and retrieving data in Android applications.</p> <p>CO5: Infer the role of permissions and security for Android applications.</p>

7 th Semester		
Subject Code	Subject Code	COs
Artificial Intelligence & Machine Learning	18CS71	<p>CO1: Appraise the theory of Artificial intelligence and Machine Learning.</p> <p>CO2: Illustrate the working of AI and ML Algorithms.</p> <p>CO3: Demonstrate the applications of AI and ML</p>

Big Data And Analytics	18CS72	<p>CO1: Understand fundamentals of Big Data analytics</p> <p>CO2: Investigate Hadoop framework and Hadoop Distributed File system.</p> <p>CO3: Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.</p> <p>CO4: Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.</p> <p>CO5: Use Machine Learning algorithms for real world big data.</p> <p>CO6: Analyze web contents and Social Networks to provide analytics with relevant visualization tools</p>
Software Architecture and Design Patterns	18CS731	<p>CO1: Design and implement codes with higher performance and lower complexity</p> <p>CO2: Be aware of code qualities needed to keep code flexible</p> <p>CO3: Experience core design principles and be able to assess the quality of a design with respect to these principles.</p> <p>CO4: Capable of applying these principles in the design of object oriented systems.</p> <p>CO5: Demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary.</p> <p>CO6: Be able to select and apply suitable patterns in specific contexts</p>
Advanced Computer Architectures	18CS733	<p>CO1: Explain the concepts of parallel computing and hardware technologies</p> <p>CO2: Compare and contrast the parallel architectures</p> <p>CO3: Illustrate parallel programming concepts</p>
Network Management	18CS742	<p>CO1: Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets.</p> <p>CO2: Apply network management standards to manage practical networks</p> <p>CO3: Formulate possible approaches for managing OSI network model.</p> <p>CO4: Use on SNMP for managing the network</p> <p>CO5: Use RMON for monitoring the behavior of the network</p> <p>CO6: Identify the various components of network and formulate the scheme for the managing them</p>
Python Application Programming (Open Elective)	18CS752	<p>CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.</p> <p>CO2: Demonstrate proficiency in handling Strings and File Systems.</p> <p>CO3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.</p> <p>CO4: Interpret the concepts of Object-Oriented Programming as used in Python.</p> <p>CO5: Implement exemplary applications related to Network Programming, Web Services and Databases in Python.</p>
Artificial Intelligence And Machine Learning Laboratory	18CSL76	<p>CO1: Implement and demonstrate AI and ML algorithms.</p> <p>CO2: Evaluate different algorithms</p>

8 th Semester		
Subject	Subject Code	Cos
Internet of Things	18CS81	<p>CO1: Interpret the impact and challenges posed by IoT networks leading to new architectural models.</p> <p>CO2: Compare and contrast the deployment of smart objects and the technologies to connect them to network.</p> <p>CO3: Appraise the role of IoT protocols for efficient network communication.</p> <p>CO4: Elaborate the need for Data Analytics and Security in IoT.</p> <p>CO5: Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.</p>
Storage Area Networks	18CS822	<p>CO1: Identify key challenges in managing information and analyze different storage networking technologies and virtualization</p> <p>CO2: Explain components and the implementation of NAS</p> <p>CO3: Describe CAS architecture and types of archives and forms of virtualization</p> <p>CO4: Illustrate the storage infrastructure and management activities</p>

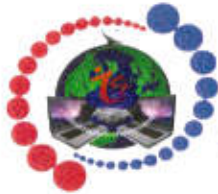

 Signature of the HOD

Professor & HOD

Department of Information Science & Engg.,
 Adichunchanagiri Institute of Technology,
 Chikkamagaluru - 577 102.


 Signature of the Principal
PRINCIPAL

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Course Outcomes

2017

1 st / 2 nd Semester		
Subject	Subject Code	Cos
Programming in C and Data Structures	17PCD13/ 17PCD23	<p>CO1: Achieve knowledge of design and development of C problem solving skills.</p> <p>CO2: Understand the basic principles of programming in V language.</p> <p>CO3: Design and develop modular programming skills.</p> <p>CO4: Effective utilization of memory using pointer technology.</p> <p>CO5: Understands the basic concepts of pointers and data structures.</p>
Computer Programming Laboratory	17CPL16/ 17CPL26	<p>CO1: Gaining knowledge on various parts of a computer.</p> <p>CO2: Able to draw flowcharts and write algorithms.</p> <p>CO3: Able design and development of C problem solving skills.</p> <p>CO4: Able design and develop modular programming skills.</p> <p>CO5: Able to trace and debug a program.</p>

3 rd Semester		
Subject	Subject Code	Cos
Engineering Mathematics	17MAT31	<p>CO1: After Studying this course, students will be able to know the use of periodic signals and Fourier series to analyze circuits and system communications.</p> <p>CO2: Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform. Employ appropriate numerical methods to solve algebraic and transcendental equations.</p> <p>CO3: Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.</p> <p>CO4: Determine the extremals of functionals and solve the simple problems of the calculus of variations.</p>
Analog and Digital Electronics	17CS32	<p>CO1: Explain the operation of JFETs and MOSFETs, Operational Amplifier circuits and their application</p> <p>CO2: Explain Combinational Logic, Simplification Techniques using Karnaugh Maps, Quine McClusky technique.</p> <p>CO3: Demonstrate Operation of Decoders, Encoders, Multiplexers, Adders and Subtractors, working of Latches, Flip-Flops, Designing Registers, Counters, A/D and D/A Converters</p> <p>CO4: Design of Counters, Registers and A/D & D/A converters</p>

Data Structures and Applications	17CS33	<p>CO1: Explain different types of data structures, operations and algorithms</p> <p>CO2: Apply searching and sorting operations on files</p> <p>CO3: Make use of stack, Queue, Lists, Trees and Graphs in problem solving.</p> <p>CO4: Develop all data structures in a high-level language for problem solving</p>
Computer Organization	17CS34	<p>CO1: Explain the basic organization of a computer system.</p> <p>CO2: Demonstrate functioning of different sub systems, such as processor, Input/output, and memory.</p> <p>CO3: Illustrate hardwired control and micro programmed control. pipelining, embedded and other computing systems.</p> <p>CO4: Build simple arithmetic and logical units.</p>
UNIX Shell Programming	17CS35	<p>CO1: Explain UNIX system and use different commands.</p> <p>CO2: Compile Shell scripts for certain functions on different subsystems.</p> <p>CO3: Demonstrate use of editors and Perl script writing</p>
Discrete Mathematical Structures	17CS36	<p>CO1: Make use of propositional and predicate logic in knowledge representation and truth verification.</p> <p>CO2: Demonstrate the application of discrete structures in different fields of computer science.</p> <p>CO3: Solve problems using recurrence relations and generating functions.</p> <p>CO4: Apply different mathematical proofs, techniques in proving theorems.</p> <p>CO5: Compare graphs, trees and their applications.</p>
Analog and Digital Electronics Laboratory	17CSL37	<p>CO1: Demonstrate various Electronic Devices like Cathode ray Oscilloscope, Signal generators, Digital Trainer Kit, Multimeters and components like Resistors, Capacitors and Integrated Circuit.</p> <p>CO2: Design and demonstrate various combinational logic circuits.</p> <p>CO3: Design and demonstrate various types of counters and Registers using Flip-flops</p> <p>CO4: Make use of simulation package to design circuits.</p> <p>CO5: Infer the working and implementation of ALU.</p>
Data Structures Laboratory	17CSL38	<p>CO1: Analyze and compare various linear and non-linear data structures</p> <p>CO2: Demonstrate the working nature of different types of data structures and their applications</p> <p>CO3: Develop, analyze and evaluate the searching and sorting algorithms</p> <p>CO4: Choose the appropriate data structure for solving real world problems</p>

4 th Semester		
Subject	Subject Code	Cos
Engineering Mathematics	17MAT41	<p>CO1: Solve first and second order ordinary differential equation arising in flow problems using single step and multistep numerical methods.</p> <p>CO2: Illustrate problems of potential theory, quantum mechanics and heat conduction by employing notions and properties of Bessel's functions and Legendre's polynomials.</p> <p>CO3: Explain the concepts of analytic functions, residues, poles of complex potentials and describe conformal and Bilinear transformation arising in field theory and signal processing.</p> <p>CO4: Develop probability distribution of discrete, continuous</p>

		<p>random variables and joint probability distribution occurring in digital signal processing, information theory and design engineering.</p> <p>CO5:Demonstrate testing of hypothesis of sampling distributions and illustrate examples of Markov chains related to discrete parameter stochastic process.</p>
Object Oriented Concepts	17CS42	<p>CO1:Explain the object-oriented concepts and JAVA.</p> <p>CO2:Develop computer programs to solve real world problems in Java.</p> <p>CO3:Develop simple GUI interfaces for a computer program to interact with users, and to comprehend the event-based GUI handling principles using Applets and swings.</p>
Design and Analysis of Algorithms	17CS43	<p>CO1:Describe computational solution to well known problems like searching, sorting etc.</p> <p>CO2:Estimate the computational complexity of different algorithms.</p> <p>CO3:Develop an algorithm using appropriate design strategies for problem solving.</p>
Microprocessors and Microcontrollers	17CS44	<p>CO1:Differentiate between microprocessors and microcontrollers</p> <p>CO2:Develop assembly language code to solve problems</p> <p>CO3:Explain interfacing of various devices to x86 family and ARM processor</p> <p>CO4:Demonstrate interrupt routines for interfacing devices</p>
Software Engineering	17CS45	<p>CO1:Design a software system, component, or process to meet desired needs within realistic constraints.</p> <p>CO2:Assess professional and ethical responsibility</p> <p>CO3:Function on multi-disciplinary teams</p> <p>CO4:Make use of techniques, skills, and modern engineering tools necessary for engineering practice</p> <p>CO5:Comprehend software systems or parts of software systems.</p>
Data Communication	17CS46	<p>CO1:Illustrate basic computer network technology.</p> <p>CO2:Identify the different types of network topologies and protocols.</p> <p>CO3:List and explain the layers of the OSI model and TCP/IP model.</p> <p>CO4:Comprehend the different types of network devices and their functions within a network</p> <p>CO5:Demonstrate subnetting and routing mechanisms.</p>
Design and Analysis of Algorithm Laboratory	17CSL47	<p>CO1:Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)</p> <p>CO2:Develop variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.</p> <p>CO3:Analyze and compare the performance of algorithms using language features.</p> <p>Apply and implement learned algorithm design techniques and data structures to solve realworld problems.</p>
Microprocessor and Microcontroller Laboratory	17CSL48	<p>CO1:Summarize 80x86 instruction sets and comprehend the knowledge of how assembly language works.</p> <p>CO2:Design and develop assembly programs using 80x86 assembly language instructions</p> <p>CO3:Infer functioning of hardware devices and interfacing them to x86 family</p> <p>CO4:Choose processors for various kinds of applications.</p>

5th Semester		
Subject	Subject	Cos

	Code	
Management And Entrepreneurship for IT Industry	17CS51	<p>CO1: Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship</p> <p>CO2: Utilize the resources available effectively through ERP</p> <p>CO3: Make use of IPRs and institutional support in entrepreneurship</p>
Computer Networks	17CS52	<p>CO1: Explain principles of application layer protocols</p> <p>CO2: Outline transport layer services and infer UDP and TCP protocols</p> <p>CO3: Classify routers, IP and Routing Algorithms in network layer</p> <p>CO4: Explain the Wireless and Mobile Networks covering IEEE 802.11 Standard</p> <p>CO5: Define Multimedia Networking and Network Management</p>
Database Management System	17CS53	<p>CO1: Summarize the concepts of database objects; enforce integrity constraints on a database using RDBMS.</p> <p>CO2: Use Structured Query Language (SQL) for database manipulation.</p> <p>CO3: Design simple database systems</p> <p>CO4: Design code for some application to interact with databases.</p>
Automata Theory and Computability	17CS54	<p>CO1: Tell the core concepts in automata theory and Theory of Computation</p> <p>CO2: Explain how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).</p> <p>CO3: Interpret Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.</p> <p>CO4: Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.</p> <p>CO5: Classify a problem with respect to different models of Computation.</p>
Introduction to Software Testing	17CS552	<p>CO1: Identify test cases for any given problem.</p> <p>CO2: Compare the different testing techniques.</p> <p>CO3: Classify the problems according to a suitable testing model.</p> <p>CO4: Apply the appropriate technique for the design of flow graph.</p> <p>CO5: Create appropriate document for the software artefact.</p>
Dot Net framework for application development;	17CS564	<p>CO1: Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#</p> <p>CO2: Demonstrate Object Oriented Programming concepts in C# programming language</p> <p>CO3: Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications.</p> <p>CO4: Illustrate the use of generics and collections in C#</p> <p>CO5: Compose queries to query in-memory data and define own operator behaviour</p>
Computer Network Laboratory	17CSL57	<p>CO1: Analyze and Compare various networking protocols.</p> <p>CO2: Demonstrate the working of different concepts of networking.</p> <p>CO3: Implement and analyze networking protocols in NS2 / NS3</p>
DBMS Laboratory with mini project	17CSL58	<p>CO1: Use Structured Query Language (SQL) for database Creation and manipulation.</p> <p>CO2: Demonstrate the working of different concepts of DBMS</p> <p>CO3: Implement and test the project developed for an application.</p>

6 th Semester		
Subject	Subject	Cos

	Code	
Cryptography, Network Security and Cyber Law	17CS61	<p>CO1:Discuss the cryptography and its need to various applications</p> <p>CO2:Design and Develop simple cryptography algorithms</p> <p>CO3:Understand the cyber security and need cyber Law</p>
File Structures	17IS62	<p>CO1:Discuss appropriate file structure for storage representation.</p> <p>CO2:Illustrate a suitable sorting technique to arrange the data.</p> <p>CO3:Explain indexing and hashing techniques for better performance to a given problem.</p>
Software Testing	17IS63	<p>CO1:Discuss test cases for any given problem</p> <p>CO2:Compare the different testing techniques</p> <p>CO3:Illustrate the problem into suitable testing model</p> <p>CO4:Understand the appropriate technique for the design of flow graph.</p> <p>CO5:Design and Develop appropriate document for the software artefact.</p>
Operating Systems	17CS64	<p>CO1:Demonstrate need for OS and different types of OS</p> <p>CO2:Discuss suitable techniques for management of different resources</p> <p>CO3:Illustrate processor, memory, storage and file system commands</p> <p>CO4:Explain the different concepts of OS in platform of usage through case studies</p>
Operations research	17CS653	<p>CO1:Explain optimization techniques for various problems.</p> <p>CO2:Understand the given problem as transportation and assignment problem and solve.</p> <p>CO3:Illustrate game theory for decision support system.</p>
Data Mining and Data Warehousing	17CS651	<p>CO1:Understands data mining problems and implement the data warehouse</p> <p>CO2:Demonstrate the association rules for a given data pattern.</p> <p>CO3:Discuss between classification and clustering solution.</p>
Mobile Application Development	17CS661	<p>CO1:Design and Develop Android application by setting up Android development environment</p> <p>CO2:Implement adaptive, responsive user interfaces that work across a wide range of devices.</p> <p>CO3:Explain long running tasks and background work in Android applications</p> <p>CO4:Demonstrate methods in storing, sharing and retrieving data in Android applications</p> <p>CO5:Discuss performance of android applications and understand the role of permissions and security</p> <p>CO6:Describe the steps involved in publishing Android application to share with the world</p>
Python Application Programming	17CS664	<p>CO1:Understand Python syntax and semantics and be fluent in the use of Python flowcontrol and functions.</p> <p>CO2:Demonstrate proficiency in handling Strings and File Systems.</p> <p>CO3:Implement Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.</p> <p>CO4:Interpret the concepts of Object-Oriented Programming as used in Python.</p>

		CO5: Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
Software Testing Laboratory	17ISL67	CO1: Understand requirements for the given problem CO2: Design and implement the solution for given problem in any programming language(C,C++,JAVA) CO3: Discuss test cases for any given problem CO4 : Apply the appropriate technique for the design of flow graph. CO5: Create appropriate document for the software artefact
File Structures Laboratory with Mini Project	17ISL68	CO1: Implement operations related to files CO2: Apply the concepts of file system to produce the given application. CO3: Evaluate performance of various file systems on given parameters

7 th Semester		
Subject	Subject Code	Cos
Web Technology and its applications	17CS71	CO1: Define HTML and CSS syntax and semantics to build web pages. CO2: Understand the concepts of Construct , visually format tables and forms using HTML using CSS CO3: Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically. CO4: List the principles of object oriented development using PHP CO5: Illustrate JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
Software Architecture and Design Patterns	17IS72	CO1: Design and implement codes with higher performance and lower complexity CO2: Illustrate the code qualities needed to keep code flexible CO3: Define core design principles and understand the importance to assess the quality of a design with respect to these principles. CO4: List the capabilities of applying these principles in the design of object oriented systems. CO5: Demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary. CO6: Recall the suitable select and apply patterns in specific contexts
Machine Learning	17CS73	CO1: Recall the problems for machine learning. And select the either supervised, unsupervised or reinforcement learning. CO2: Understand theory of probability and statistics related to machine learning CO3: Illustrate concept learning, ANN, Bayes classifier, k nearest neighbor, Q,
UNIX System Programming	17CS744	CO1: Understand the working of Unix Systems CO2: Illustrate the application/service over a UNIX system.
Storage Area Networks	17CS754	CO1: Identify key challenges in managing information and analyze different storagenetworking technologies and virtualization CO2: Explain components and the implementation of NAS

		<p>CO3:Describe CAS architecture and types of archives and forms of virtualization</p> <p>CO4:Illustrate the storage infrastructure and management activities</p>
Machine Learning Laboratory	17CSL76	<p>CO1:Understand the implementation procedures for the machine learning algorithms.</p> <p>CO2:Design Java/Python programs for various Learning algorithms.</p> <p>CO3:Apply appropriate data sets to the Machine Learning algorithms.</p> <p>CO4:Identify and apply Machine Learning algorithms to solve real world problems.</p>
Web Technology Laboratory with mini project	17CSL77	<p>CO1:Design and develop dynamic web pages with good aesthetic sense of designing and latest technical know-how's.</p> <p>CO2:Understand the concepts of Web Application Terminologies, Internet Tools other web services.</p> <p>CO3:Recall how to link and publish web sites</p>

8 th Semester		
Subject	Subject Code	Cos
Internet of Things and Applications	17CS81	<p>CO1:Interpret the impact and challenges posed by IoT networks leading to new architectural models.</p> <p>CO2:Compare and contrast the deployment of smart objects and the technologies to connect them to network.</p> <p>CO3:Appraise the role of IoT protocols for efficient network communication.</p> <p>CO4:Elaborate the need for Data Analytics and Security in IoT.</p> <p>CO5:Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry</p>
Big Data Analytics	17CS82	<p>CO1:Explain the concepts of HDFS and MapReduce framework</p> <p>CO2:Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration</p> <p>CO3:Recognize the role of Business Intelligence, Data warehousing and Visualization in decision making</p> <p>CO4:Infer the importance of core data mining techniques for data analytics</p> <p>CO5:Compare and contrast different Text Mining Techniques</p>
System Modeling and Simulation	17CS834	<p>CO1:Explain the system concept and apply functional modeling method to model the activities of a static system</p> <p>CO2:Describe the behavior of a dynamic system and create an analogous model for a dynamic system;</p> <p>CO3:Illustrate the operation of a dynamic system and make improvement according to the simulation results.</p>
Internship/ Professional Practice	17CS84	<p>CO1:Adapt easily to the industry environment</p> <p>CO2:Take part in team work</p> <p>CO3:Make use of modern tools</p> <p>CO4:Decide upon project planning and financing.</p> <p>CO5:Adapt ethical values.</p> <p>CO6:Motivate for lifelong learning</p>
Project Work-II	17CSP85	<p>CO1:Identify a issue and derive problem related to society, environment, economics, energy and technology</p> <p>CO2:Formulate and Analyze the problem and determine the scope of the solution chosen</p> <p>CO3:Determine , dissect, and estimate the parameters, required in</p>

		<p>the solution.</p> <p>CO4:Evaluate the solution by considering the standard data / Objective function and by using appropriate performance metrics.</p> <p>CO5:Compile the report and take part in present / publishing the finding in a reputed conference / publications</p> <p>CO6:Attempt to obtain ownership of the solution / product developed.</p>
Seminar	17CSS86	<p>CO1:Survey the changes in the technologies relevant to the topic selected</p> <p>CO2:Discuss the technology and interpret the impact on the society, environment and domain.</p> <p>CO3:Compile report of the study and present to the audience, following the ethics.</p>



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Ref: AIT/IS&E/101/2021

Course Outcomes

2021

1 st / 2 nd Semester		
Subject	Subject code	Co
Problem-Solving Through Programming	21PSP23/13	CO1: Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts. CO2: Apply programming constructs of C language to solve the real world problem CO3: Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting CO4: Explore user-defined data structures like structures, unions and pointers in implementing solutions CO5: Design and Develop Solutions to problems using modular programming constructs using functions
Computer Programming Laboratory	21CPL27/17	CO1: Define the problem statement and identify the need for computer programming CO2: Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming CO3: Develop algorithm, flowchart and write programs to solve the given problem CO4: Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving. CO5: Document the inference and observations made from the implementation.

3 rd Semester		
Subject	Subject code	Co
Transform Calculus, Fourier Series and Numerical Techniques.	21MAT31	CO1: To solve ordinary differential equations using Laplace transform. CO2: Demostrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory. CO3: To use Fourier transforms to analyze problems involving continuous-time signals and to apply ZTransform techniques to solve difference equations CO4: To solve mathematical models represented by initial or

		<p>boundary value problems involving partial differential equations</p> <p>CO5: Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.</p>
Data Structures and its Applications	21CS32	<p>CO1: Identify different data structures and their applications.</p> <p>CO2: Apply stack and queues in solving problems.</p> <p>CO3: Demonstrate applications of linked list.</p> <p>CO4: Explore the applications of trees and graphs to model and solve the real-world problem.</p> <p>CO5: Make use of Hashing techniques and resolve collisions during mapping of key value pairs</p>
Analog and Digital Electronics	21CS33	<p>CO1: Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.</p> <p>CO2: Explain the basic principles of A/D and D/A conversion circuits and develop the same.</p> <p>CO3: Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods</p> <p>CO4: Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.</p> <p>CO5: Develop simple HDL programs</p>
Computer Organization and Architecture	21CS34	<p>CO1: Explain the organization and architecture of computer systems with machine instructions and programs</p> <p>CO2: Analyze the input/output devices communicating with computer system</p> <p>CO3: Demonstrate the functions of different types of memory devices</p> <p>CO4: Apply different data types on simple arithmetic and logical unit</p> <p>CO5: Analyze the functions of basic processing unit, Parallel processing and pipelining</p>
Object Oriented Programming with JAVA Laboratory	21CSL35	<p>CO1: Use Eclipse/NetBeans IDE to design, develop, debug Java Projects.</p> <p>CO2: Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.</p> <p>CO3: Demonstrate the ability to design and develop java programs, analyze, and interpret objectoriented data and document results.</p> <p>CO4: Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.</p> <p>CO5: Develop user friendly applications using File I/O and GUI concepts.</p>
Mastering Office	21CSL381	<p>CO1: Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.</p> <p>CO2: Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker</p> <p>CO3: Attain the knowledge about spreadsheet with formula, macros spell checker etc.</p> <p>CO4: Demonstrate the ability to apply application software in an office environment.</p> <p>CO5: Use Google Suite for office data management tasks</p>

Programming in C++	21CS382	<p>CO1: Able to understand and design the solution to a problem using object-oriented programming concepts.</p> <p>CO2: Able to reuse the code with extensible Class types, User-defined operators and function Overloading.</p> <p>CO3: Achieve code reusability and extensibility by means of Inheritance and Polymorphism</p> <p>CO4: Identify and explore the Performance analysis of I/O Streams.</p> <p>CO5: Implement the features of C++ including templates, exceptions and file handling for providing programmed solutions to complex problems.</p>
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4th Semester

Subject	Subject code	Co
Mathematical Foundations for Computing	21CS41	<p>CO1: Apply the concepts of logic for effective computation and relating problems in the Engineering domain.</p> <p>CO2: Analyze the concepts of functions and relations to various fields of Engineering. Comprehend the concepts of Graph Theory for various applications of Computational sciences.</p> <p>CO3: Apply discrete and continuous probability distributions in analysing the probability models arising in the engineering field.</p> <p>CO4: Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.</p> <p>CO5: Construct joint probability distributions and demonstrate the validity of testing the hypothesis.</p>
Design and Analysis of Algorithms	21CS42	<p>CO1: Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.</p> <p>CO2: Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same</p> <p>CO3: Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.</p> <p>CO4: Apply and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.</p> <p>CO5: Apply and analyze backtracking, branch and bound methods and to describe P, NP and NPComplete problems.</p>
Microcontroller and Embedded Systems	21CS43	<p>CO1: Explain C-Compilers and optimization</p> <p>CO2: Describe the ARM microcontroller's architectural features and program module.</p> <p>CO3: Apply the knowledge gained from programming on ARM to different applications.</p> <p>CO4: Program the basic hardware components and their application selection method.</p> <p>CO5: Demonstrate the need for a real-time operating system for embedded system applications.</p>
Operating Systems	21CS44	<p>CO1: Identify the structure of an operating system and its scheduling mechanism.</p> <p>CO2: Demonstrate the allocation of resources for a process using scheduling algorithm.</p> <p>CO3: Identify root causes of deadlock and provide the solution</p>

		<p>for deadlock elimination</p> <p>CO4: Explore about the storage structures and learn about the Linux Operating system.</p> <p>CO5: Analyze Storage Structures and Implement Customized Case study</p>
Python Programming Laboratory	21CSL46	<p>CO1: Demonstrate proficiency in handling of loops and creation of functions.</p> <p>CO2: Identify the methods to create and manipulate lists, tuples and dictionaries.</p> <p>CO3: Discover the commonly used operations involving regular expressions and file system.</p> <p>CO4: Interpret the concepts of Object-Oriented Programming as used in Python.</p> <p>CO5: Determine the need for scraping websites and working with PDF, JSON and other file formats.</p>
Web Programming	21CSL481	<p>CO1: Describe the fundamentals of web and concept of HTML.</p> <p>CO2: Use the concepts of HTML, XHTML to construct the web pages.</p> <p>CO3: Interpret CSS for dynamic documents.</p> <p>CO4: Evaluate different concepts of JavaScript & Construct dynamic documents.</p> <p>CO5: Design a small project with JavaScript and XHTML.</p>
Unix Shell Programming	21CS482	<p>CO1: Know the basics of Unix concepts and commands.</p> <p>CO2: Evaluate the UNIX file system.</p> <p>CO3: Apply Changes in file system.</p> <p>CO4: Understand scripts and programs.</p> <p>CO5: Analyze Facility with UNIX system process</p>
R Programming	21CSL483	<p>CO1: To understand the fundamental syntax of R through readings, practice exercises,</p> <p>CO2: To demonstrations, and writing R code.</p> <p>CO3: To apply critical programming language concepts such as data types, iteration,</p> <p>CO4: To understand control structures, functions, and Boolean operators by writing R programs and through examples</p> <p>CO5: To import a variety of data formats into R using R-Studio</p> <p>CO6: To prepare or tidy data for in preparation for analyze.</p>

5 th Semester		
Subject	Subject code	Co
Automata Theory and compiler Design	21CS51	<p>CO1: Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation</p> <p>CO2: Design and develop lexical analyzers, parsers and code generators</p> <p>CO3: Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.</p> <p>CO4: Acquire fundamental understanding of the structure of a Compiler and Apply concepts automata theory and Theory of Computation to design Compilers</p> <p>CO5: Design computations models for problems in Automata theory and adaptation of such model in the field of compilers</p>

Computer Networks	21CS52	<p>CO1: Learn the basic needs of communication system.</p> <p>CO2: Interpret the communication challenges and its solution.</p> <p>CO3: Identify and organize the communication system network components</p> <p>CO4: Design communication networks for user requirements.</p>
Database Management Systems	21CS53	<p>CO1: Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS</p> <p>CO2: Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.</p> <p>CO3: Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database</p> <p>CO4: Develop application to interact with databases, relational algebra expression.</p> <p>CO5: Develop applications using tuple and domain relation expression from queries.</p>
Artificial Intelligence and Machine Learning	21CS54	<p>CO1: Apply the knowledge of searching and reasoning techniques for different applications.</p> <p>CO2: Have a good understanding of machine learning in relation to other fields and fundamental issues and challenges of machine learning.</p> <p>CO3: Apply the knowledge of classification algorithms on various dataset and compare results</p> <p>CO4: Model the neuron and Neural Network, and to analyze ANN learning and its applications.</p> <p>CO5: Identifying the suitable clustering algorithm for different pattern</p>
Database Management Systems Laboratory with Mini Project	21CSL55	<p>CO1: Create, Update and query on the database.</p> <p>CO2: Demonstrate the working of different concepts of DBMS</p> <p>CO3: Implement, analyze and evaluate the project developed for an application.</p>
Angular JS and Node JS	21CSL581	<p>CO1: Describe the features of Angular JS.</p> <p>CO2: Recognize the form validations and controls.</p> <p>CO3: Implement Directives and Controllers.</p> <p>CO4: Evaluate and create database for simple application.</p> <p>CO5: Plan and build webservers with node using Node .JS.</p>
C# AND .NET FRAMEWORK	21CS582	<p>CO1: Able to explain how C# fits into the .NET platform.</p> <p>CO2: Describe the utilization of variables and constants of C#</p> <p>CO3: Use the implementation of object-oriented aspects in applications.</p> <p>CO4: Analyze and Set up Environment of .NET Core.</p> <p>CO5: Evaluate and create a simple project application.</p>


6 th Semester		
Subject	Subject code	Co
Software Engineering and Project Management	21CS61	<p>CO1: Understand the activities involved in software engineering and analyze the role of various process models</p> <p>CO2: Explain the basics of object-oriented concepts and build a suitable class model using modelling techniques</p> <p>CO3: Describe various software testing methods and to understand the importance of agile methodology and DevOps</p> <p>CO4: Illustrate the role of project planning and quality</p>

		<p>management in software development</p> <p>CO5: Understand the importance of activity planning and different planning models</p>
Fullstack Development	21CS62	<p>CO1: Understand the working of MVT based full stack web development with Django.</p> <p>CO2: Designing of Models and Forms for rapid development of web pages.</p> <p>CO3: Analyze the role of Template Inheritance and Generic views for developing full stack web applications.</p> <p>CO4: Apply the Django framework libraries to render nonHTML contents like CSV and PDF.</p> <p>CO5: Perform jQuery based AJAX integration to Django Apps to build responsive full stack web applications,</p>
Software Testing	21IS63	<p>CO1: Explain the significance of software testing and quality assurance in software development</p> <p>CO2: Apply the concepts of software testing to assess the most appropriate testing method.</p> <p>CO3: Analyze the importance of testing in software development.</p> <p>CO4: Evaluate the suitable testing model to derive test cases for any given software</p> <p>CO5: Develop appropriate document for the software artefact.</p>
Agile Technology	21CS641	<p>CO1: Understand the fundamentals of agile technologies</p> <p>CO2: Explain XP Lifecycle, XP Concepts and Adopting XP</p> <p>CO3: Apply different techniques on Practicing XP, Collaborating and Releasing</p> <p>CO4: Analyze the Values and Principles of Mastering Agility</p> <p>CO5: Demonstrate the agility to deliver good values</p>
Advanced JAVA Programming	21CS642	<p>CO1: Understanding the fundamental concepts of Enumerations and Annotations</p> <p>CO2: Apply the concepts of Generic classes in Java programs</p> <p>CO3: Demonstrate the concepts of String operations in Java</p> <p>CO4: Develop web based applications using Java servlets and JSP</p> <p>CO5: Illustrate database interaction and transaction processing in Java</p>
Data Mining and Data Warehousing	21IS643	<p>CO1: Understand warehousing architectures and tools for systematically organizing large database and use their data to make strategic decisions.</p> <p>CO2: Apply KDD process for finding interesting pattern from warehouse.</p> <p>CO3: Analyze the kinds of patterns that can be discovered by association rule mining.</p> <p>CO4: Evaluate interesting patterns from large amounts of data to analyze for predictions and classification.</p> <p>CO5: Design select suitable methods for data mining and analysis.</p>
Data science and Visualization	21CS644	<p>CO1: Understand the data in different forms</p> <p>CO2: Apply different techniques to Explore Data Analysis and the Data Science Process</p> <p>CO3: Analyze feature selection algorithms & design a recommender system.</p> <p>CO4: Evaluate data visualization tools and libraries and plot graphs.</p> <p>CO5: Develop different charts and include mathematical expressions.</p>
Software Testing	21ISL66	<p>CO1: List out the requirements for the given problem and develop test cases for any given problem .</p>

Laboratory		<p>CO2: Design and implement the solution for given problem and to design flow graph</p> <p>CO3: Use Eclipse/NetBeans IDE and testing tools to design, develop, debug the Project and create appropriate document for the software artifact.</p> <p>CO4: Use the appropriate functional testing strategies. Compare the different testing techniques.</p> <p>CO5: Classify and Compare the problems according to a suitable testing model applying the test coverage metrics.</p>
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7 th Semester		
Subject	Subject	Subject
Cryptography and Network Security	21IS71	<p>CO1: Understand Cryptography, Network Security theories, algorithms and systems</p> <p>CO2: Apply different Cryptography and Network Security operations on different applications</p> <p>CO3: Analyse different methods for authentication and access control</p> <p>CO4: Evaluate Public and Private key, Key management, distribution and certification</p> <p>CO5: Design necessary techniques to build protection mechanisms to secure computer networks</p>
Cloud Computing	21CS72	<p>CO1: Understand and analyze various cloud computing platforms and service provider.</p> <p>CO2: Illustrate various virtualization concepts.</p> <p>CO3: Identify the architecture, infrastructure and delivery models of cloud computing.</p> <p>CO4: Understand the Security aspects of CLOUD.</p> <p>CO5: Define platforms for development of cloud applications</p>
Object oriented Modelling and Design	21CS731	<p>CO1: Describe the concepts of object-oriented and basic class modelling.</p> <p>CO2: Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.</p> <p>CO3: Choose and apply a befitting design pattern for the given problem.</p>
Digital Image Processing	21CS732	<p>CO1: Understand the fundamentals of Digital Image Processing.</p> <p>CO2: Apply different Image transformation techniques</p> <p>CO3: Analyze various image restoration techniques</p> <p>CO4: Understand colour image and morphological processing</p> <p>CO5: Design image analysis and segmentation techniques</p>
User Interface Design	21CS733	<p>CO1: Understand importance and characteristics of user interface design</p> <p>CO2: Apply user interface design process on business functions</p> <p>CO3: Demonstrate system menus, navigation schemes and windows characteristics</p> <p>CO4: Analyze screen based controls and device based controls</p> <p>CO5: Design the prototypes and test plans of user interface</p>
Blockchain Technology	21CS734	<p>CO1: Describe the concepts of Distributed computing and its role in Blockchain</p> <p>CO2: Describe the concepts of Cryptography and its role in Blockchain</p> <p>CO3: List the benefits, drawbacks and applications of Blockchain</p> <p>CO4: Appreciate the technologies involved in Bitcoin</p> <p>CO5: Appreciate and demonstrate the Ethereum platform to develop</p>

		blockchain application.
Internet of Things	21CS735	<p>CO1: Understand the evolution of IoT, IoT networking components, and addressing strategies in IoT.</p> <p>CO2: Analyze various sensing devices and actuator types.</p> <p>CO3: Demonstrate the processing in IoT.</p> <p>CO4: Apply different connectivity technologies.</p> <p>CO5: Understand the communication technologies , protocols and interoperability in IoT.</p>
Software Architecture and Design Patterns	21CS741	<p>CO1: Design and implement codes with higher performance and lower complexity</p> <p>CO2: Be aware of code qualities needed to keep code flexible</p> <p>CO3: Experience core design principles and be able to assess the quality of a design with respect to these principles.</p> <p>CO4: Capable of applying these principles in the design of object oriented systems.</p> <p>CO5: Demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary.</p> <p>CO6: Be able to select and apply suitable patterns in specific contexts</p>
File Structures	21IS742	<p>CO1: Understand the fundamental concepts of file processing operations and storage structures</p> <p>CO2: Apply object orientation concepts to manipulate records</p> <p>CO3: Apply concepts of sorting and merging on multiple files</p> <p>CO4: Analyze the sequential and indexing file accessing techniques with appropriate data structures</p> <p>CO5: Illustrate the usage of hashing techniques to organize file structures</p>
Deep Learning	21CS743	<p>CO1: Understand the fundamental issues and challenges of deep learning data, model selection, model complexity etc.,</p> <p>CO2: Describe various knowledge on deep learning and algorithms</p> <p>CO3: Apply CNN and RNN model for real time applications</p> <p>CO4: Identify various challenges involved in designing and implementing deep learning algorithms.</p> <p>CO5: Relate the deep learning algorithms for the given types of learning tasks in varied domain</p>
Robotic Process Automation Design and Development	21CS744	<p>CO1: To Understand the basic concepts of RPA</p> <p>CO2: To Describe various components and platforms of RPA</p> <p>CO3: To Describe the different types of variables, control flow and data manipulation techniques</p> <p>CO4:To Understand various control techniques and OCR in RPA</p> <p>CO5: To Describe various types and strategies to handle exceptions</p>
NoSQL Data Base	21CS745	<p>CO1: Demonstrate an understanding of the detailed architecture of Column Oriented NoSQL databases, Document databases, Graph databases.</p> <p>CO2: Use the concepts pertaining to all the types of databases.</p> <p>CO3: Analyze the structural Models of NoSQL.</p> <p>CO4: Develop various applications using NoSQL databases.</p>


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**Adichunchanagiri Institute of Technology
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING
CO-PO Mapping**

CO-PO Mapping

2021-22 DC-IS-DMA170C5421-A-CURS 2018

Planned

Slight: 1 Moderate: 2 High: 3

CO-PO

IS Department PO Details

- CO1 Describe computational solution to well known problems like searching, sorting etc.
- CO2 Estimate the computational complexity of different algorithms.
- CO3 Devise an algorithm using appropriate design strategies for problem solving.

Status : SUBMITTED to Dr.Sampath S

CO - PO Mapping for IS

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	MODERATE	SUBST	MODERATE	SUBST	NO MAPPING	NO MAPPING	NO MAPPING	NO MAPPING	MODERATE	MODERATE	NO MAPPING	MODERATE
CO 2	HIGH	HIGH	MODERATE	MODERATE	NO MAPPING	NO MAPPING	NO MAPPING	NO MAPPING	MODERATE	MODERATE	NO MAPPING	MODERATE
CO 3	HIGH	MODERATE	HIGH	MODERATE	NO MAPPING	NO MAPPING	NO MAPPING	NO MAPPING	MODERATE	MODERATE	NO MAPPING	MODERATE

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Adichunchanagiri Institute of Technology
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

CO-PO Attainment

Batch Type: Generic Assessment
Faculty Name: Ms. Ashwini Kamath
Department Name: Information Science and Engineering(IS)
Subject: Design and Analysis of Algorithms
Semester : 4 - Section : A - CourseCode : 18CS42

Course Outcomes	Internal Assessment (IA)		Other Assessment (Other Assessment)		University Exam		Direct Attainment	
	Attainment(out of 3)	Attainment(out of 100)	Attainment(out of 3)	Attainment(out of 100)	Attainment(out of 3)	Attainment(out of 100)	Attainment(out of 3)	Attainment(out of 100)
18CS42.1	2.48	82.82	3	100	0.86	28.81	1.91	63.79
18CS42.2	3	100	3	100	0.86	28.81	2.15	71.52
18CS42.3	3	100	3	100	0.86	28.81	2.15	71.52

Feedback Attainment(out of 3)	Indirect Attainment		Total Attainment	
	Attainment(out of 100)	Attainment(out of 3)	Attainment(out of 3)	Attainment(out of 100)
0.77	25.64	0.77	1.68	56.16
0.74	24.57	0.74	1.86	62.13
0.74	24.57	0.74	1.86	62.13


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**Adichunchanagiri Institute of Technology
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**

CO-PSO Mapping

CO-PSO		IS Department PSO Details			
CO	Description	PSO Number	Title		
CO1	Describe computational solution to well known problems like searching, sorting, etc.				
CO2	Estimate the computational complexity of different algorithms.	PSO 1	Graduates will be able to understand, analyze information technology problems and provide solutions through their problem solving skills		
CO3	Devise an algorithm using appropriate design strategies for problem solving.	PSO 2	Graduates will be able to apply the skills of programming in software development		
		PSO 3	Graduates will be able to work in industries in the areas of web designing, software testing, development and maintenance		
		PSO 4	Should have the capability to comprehend the technological advancements in the usage of modern design tools to analyze and design subsystems/processes for a variety of applications		

Status : APPROVED by Dr.Sampath S

CO - PSO Mapping for IS

CO	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	HIGH	MODERATE	MODERATE	NO-MAPPING
CO 2	MODERATE	SLIGHT	NO-MAPPING	NO-MAPPING
CO 3	SLIGHT	MODERATE	MODERATE	NO-MAPPING

Chinnappa
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