ACHARYA INSTITUTE OF TECHNOLOGY

Affiliated to Visvesvaraya Technological University, Belagavi,
Approved by AICTE, New Delhi, Recognized by Govt. of Karnataka and
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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

2021 SCHEME

Course Name	Course Code	CO. No.	Course Outcomes
TRANSFORM CALCULUS, FOURIER SERIES & NUMERICAL TECHNIQUES (COMMON TO ALL)	21MAT31	CO1	Understand The Concepts Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations
		CO2	Demonstrate Various Physical Phenomena Using The Concepts Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations
		CO3	Apply The Knowledge Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations In Modeling Various Physical And Engineering Phenomena.
		CO4	Relate The Concepts Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations To Their Respective Branches.
DATA STRUCTURES AND APPLICATIONS	21CS32	CO1	Llustrate Various Linear And Non-Linear Data Structures.
		CO2	Analyze Appropriate Data Structure To Be Applied For A Specific Problem.
		CO3	Assess Basic Operations On Various Data Structures.
		CO4	Construct Programs For Applications In Data Structures Using A High-Level Language.
ANALOG AND DIGITAL ELECTRONICS	21CS33	CO1	Implement Various Simple Analog And Digital Circuits For The Given Specification Using Appropriate Design Techniques.
		CO2	Apply The Knowledge Of Various Boolean Expression Minimization Techniques To Obtain Simplified Equations Required For The Implementation Of Simple Combinational And Sequential Digital Circuits.
		CO3	Develop HDL Programs To Simulate Simple Digital Circuits.
		CO4	Analyze The Operational Characteristics & Performance Of Various OPAMP Application Circuits.
COMPUTER	21CS34	CO1	Distinguish Organization And Architecture Of

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ORGANIZATION AND ARCHITECTURE			Computer Systems With Machine Instructions And Programs.
		CO2	Analyse The Input/Output Devices Communicating With Computer System
		CO3	Analyse The Functions Of Different Types Of Memory Devices And Its Mapping
		CO4	Apply Different Data Types On Simple Arithmetic And Logic Unit
OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY	21CSL35	CO1	Analyze The Necessity For Object Oriented Programming Paradigm Over Structured Programming And Become Familiar With The Fundamental Concepts In OOP.
		CO2	Demonstrate The Ability To Design And Develop Java Programs, Analyze, And Interpret Object-Oriented Data And Document Results.
		CO3	Apply The Concepts Of Multiprogramming, Exception/Event Handling, Abstraction To Develop Robust Programs
		CO4	Develop User Friendly Applications Using File I/O And GUI Concepts.
SOCIAL CONNECT AND RESPONSIBILITY	21UH36	CO1	Understand Social Responsibility And Ethics Towards Mankind And Environment
		CO2	Practice Sustainability And Creativity To Have An Impact On The Society.
		CO3	Exhibit Planning And Organizational Skills In A Given Platform
		CO4	Effectively Communicate The Ideas/Process/Solutions In Both Verbal And Written
SAMSKRUTIKA KANNADA	21KSK37/47	CO1	Kannada Nadu,Nudi Mattu Samsruthiya Bagge Parichaya
		CO2	Kannada Adalitha Padagala Parichaya.
		CO3	Kannada Vachanagala Parichaya.
		CO4	Kannada Janapada Sahithya.
BALAKE KANNADA	21KBK37/47	CO1	Kannada Padagala Parichaya
		CO2	Kannada Bhaseyalli Mathanaduvudu ,Oduvudhu, Bareyuvudhu.
		CO3	Kannadadhali Samvahana Nadesuvudhu.
		CO4	Prathi Dina Kannada Padagala Balake
		CO5	Kannadadhali Vyavahisuvadu.
CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS	21CIP37/47	CO1	Analyse The Basic Structure Of Indian Constitution.
		CO2	Remember Their Fundamental Rights, DPSP's And Fundamental Duties (FD's) Of Our Constitution.
		CO3	Know About Our Union Government, Political Structure & Codes, Procedures.

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		CO4	Understand Our State Executive & Elections System Of India.
		CO5	Remember The Amendments And Emergency Provisions, Other Important Provisions Given By The Constitution.
PROGRAMMING IN C++	21CS382	CO1	Able To Understand And Design The Solution To A Problem Using Object-Oriented Programming Concepts.
		CO2	Able To Reuse The Code With Extensible Class Types, User-Defined Operators And Function Overloading.
		CO3	Achieve Code Reusability And Extensibility By Means Of Inheritance And Polymorphism
		CO4	Identify And Explore The Performance Analysis Of I/O Streams.
		CO5	Implement The Features Of C++ Including Templates, Exceptions And File Handling For Providing Programmed Solutions To Complex Problems.
MATHEMATICAL FOUNDATIONS FOR COMPUTING	21CS41	CO1	Apply The Concepts Of Logic For Effective Computation And Relating Problems In The Engineering Domain.
		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.
		CO3	Apply Discrete And Continuous Probability Distributions In Analysing The Probability Models Arising In The Engineering Field.
		CO4	Make Use Of The Correlation And Regression Analysis To Fit A Suitable Mathematical Model For The Statistical Data.
		CO5	Construct Joint Probability Distributions And Demonstrate The Validity Of Testing The Hypothesis.
DESIGN AND ANALYSIS OF ALGORITHMS	21CS42	CO1	Illustrate Time And Space Complexity Of The Algorithm Mathematically Using Asymptotic Notations.
		CO2	Apply Divide And Conquer Approaches And Decrease And Conquer Approaches In Solving The Problems Compute The Performance Of The Same.
		CO3	Apply The Appropriate Algorithmic Design Technique Like Greedy Method, Spanning Tree, Shortest Path And Compare The Efficiency Of Algorithms To Solve The Given Problem
		CO4	Analyze Dynamic Programming, Transitive

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			Closure Approaches To Solve Problems And Analyze The Space-Time Complexity
		CO5	Apply Backtracking, Branch And Bound, NP-Complete And NP-Hard Methods To Solve Given Problems.
MICROCONTROLLER AND EMBEDDED SYSTEMS	21CS43	CO1	Develop Simple Programs Using The Conceptual Knowledge Of Hardware Organization And Instruction Set Of Microcontrollers (ARM-7 TDMI LPC-2148)
		CO2	Analyze The Features And Functionalities Of Different RTOS, Simulators And Ides Used For Designing And Debugging The Embedded Systems.
		CO3	Develop And Execute Simple Data Processing Programs In ARM Assembly Language Using Keil IDE.
		CO4	Develop And Execute C Programs Based On Control Logic For Interfacing Hardware Peripherals With The Microcontrollers.
OPERATING SYSTEMS	21CS44	CO1	Identify The Structure Of An Operating System And Its Scheduling Mechanism.
		CO2	Demonstrate The Allocation Of Resources For A Process Using Scheduling Algorithm.
		CO3	Identify Root Causes Of Deadlock And Provide The Solution For Deadlock Elimination
		CO4	Explore About The Storage Structures And Learn About The Linux Operating System.
		CO5	Analyze Storage Structures And Implement Customized Case Study
BIOLOGY FOR ENGINEERS	21BE45	CO1	To Know The Fundamentals Of Biological Cellular Systems And To Familiarize The Students With The Basic Biological Concepts And Their Engineering Applications.
		CO2	To Enable The Students With An Understanding Of Biodesign Principles To Create Novel Devices And Structures.
		CO3	To Provide The Students An Appreciation Of How Biological Systems Can Be Re-Designed As Substitute Products For Natural Systems.
		CO4	To Motivate The Students Develop The Interdisciplinary Vision Of Biological Engineering.
PYTHON PROGRAMMING LABORATORY	21CSL46	CO1	Demonstrate Proficiency In Handling Of Loops And Creation Of Functions.
		CO2	Identify The Methods To Create And Manipulate Lists, Tuples And Dictionaries.

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		CO3	Discover The Commonly Used Operations Involving Regular Expressions And File System.
		CO4	Interpret The Concepts Of Object-Oriented Programming As Used In Python.
		CO5	Determine The Need For Scraping Websites And Working With PDF, JSON And Other File Formats.
AUTOMATA THEORY AND COMPILER DESIGN	21CS51	CO1	Illustrate The Fundamental Concepts In Automata Theory ,Formal Languages And Compiler Design
		CO2	Demonstrate Application Of Automata Theory , Formal Languages And Lexical Phase Of Compiler
		CO3	Design Of Context Free Grammar And Process Of Parsing
		CO4	Develop An Understanding Of Computation Through Push Down Automata And Syntax Analysis Phase Of Compiler
		CO5	Examine Computation Through Turing Machine And Other Phases Of Compiler
COMPUTER NETWORKS	21CS52	CO1	1. Illustrate The Fundamental Concepts Of Network Hardware, Software, Reference Models And Physical Layer.
		CO2	2 .Apply The Various Schemes, Techniques And Protocol Concepts In Resolving Simple Issues Like Error Detection And Correction Encountered In The Data Link Layer.
		CO3	3. Apply The Various Routing Algorithms, Congestion Control Algorithm And Techniques To Achieve Good Qos In Resolving The Network Layer Design Issues And Improve Performance.
		CO4	4. Illustrate Transport Layer Service, Protocols
		CO5	5. Illustrate The Various Functionalities And Associated Protocols With Respect To Application Layer.
		CO6	6. Simulate Basic Functionalities Of Various Kind Of Networks For The Given Specification Using NS2 Simulator. Write Java Programs To Simulate Basic Network Algorithms And Functionalities.
DATABASE MANAGEMENT SYSTEMS	21CS53	CO1	Analyze Databases, Their Benefits, History, Entity-Based Data Modeling, And ER Diagram Creation
		CO2	Apply The Relational Model, Constraints, Operations, Relational Algebra, And Mapping ER Designs To Relational Databases.
		CO3	Apply SQL Data Definition And Retrieval,

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			Advanced Queries, JDBC For Apps, And Stored Procedures.
		CO4	Apply Normalization Theory, Functional Dependencies, And Algorithms To Proficiently Design Optimized Relational Databases.
		CO5	Apply Transaction Concepts, Analyze Schedules, Understand SQL Transactions, And Implement Concurrency Control Techniques.
PRINCIPLES OF ARTIFICIAL INTELLIGENCE	21AI54	CO1	Apply Knowledge Of Agent Architecture, Searching And Reasoning Techniques For Different Applications.
		CO2	Analyse Searching And Inferencing Techniques.
		CO3	Develop Knowledge Base Sentences Using Propositional Logic And First-Order Logic.
		CO4	Demonstrating Agents, Searching And Inferencing
		CO5	Illustrate The Application Of Probability In Uncertain Reasoning.
DATABASE MANAGEMENT SYSTEMS LABORATORY WITH MINI PROJECT	21CSL55	CO1	Understand The Basics Concepts And SQL Queries Of Database Management System.
		CO2	Apply Conceptual Design Models And Hierarchical Structures Of Database Management To Translate Real-World Requirements Into Database Schemas.
		CO3	Analyze Constraints, Design Schemas, Implement Database Structures, And Assess The Effectiveness Of Various Concepts Within A Database Management System.
RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS	21CS56	CO1	1.Explain The Concepts Of Engineering Research And Ethics Associated With It.
		CO2	2. Illustrate The Procedure Of Literature Review And Technical Reading And Analyze The Literature Review And Technical Reading With Citations
		CO3	3.Describe The Fundamentals Of Intellectual Property, Patent Laws And Drafting Procedure
		CO4	4.Explain The Copyright Laws, Related Rights And Concepts Of Trademarks
		CO5	5.Describe The Principles Of Industrial Designs, Design Rights And Geographical Indications Concepts
ENVIRONMENTAL STUDIES	21CIV57	CO1	1.Understand The Principles Of Ecology And Environmental Issues That Apply To Air, Land, And Water Issues On A Global Scale,
		CO2	2.Develop Critical Thinking And/Or Observation Skills, And Apply Them To The Analysis Of A

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			Problem Or Question Related To The Environment.
		CO3	3. Demonstrate Ecology Knowledge Of A Complex Relationship Between Biotic And A Biotic Components.
		CO4	4. Apply Their Ecological Knowledge To Illustrate And Graph A Problem And Describe The Realities That Managers Face When Dealing With Complex Issues.
C# AND .NET FRAMEWORK	21CS582	CO1	1. Develop Programs Involving Basic Features Of C# Programming Language
		CO2	2. Make Use Of Exception Handling Features To Safeguard Program Against Runtime Anomalies
		CO3	3. Apply Concepts Of OOP In Developing Solutions To Problems
		CO4	4. Develop Programs To Illustrate Handling Of Text Files
		CO5	5. Make Use Of Modern Tools To Develop C# Programs And Applications
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT	21CS61	CO1	1. Illustrate Various Models For Software Engineering Process.
		CO2	2. Analyze Software Engineering And UML Models Through Various Use Cases.
		CO3	3. Illustrate Various Agile Models For Software Development.
		CO4	4. Apply Various Planning Models To Project Management Activities.
		CO5	5. Apply Quality Management Techniques To Enhance Software Quality.
DATA SCIENCE AND ITS APPLICATIONS	21AD62	CO1	Illustrate Various Data Visualization Tools.
		CO2	Apply Statistical Tests For Data Analysis And Manipulation.
		CO3	Apply Machine Learning Algorithms And Techniques To Build Predictive Models
		CO4	Demonstrate The Construction Of Decision Tree And Data Partition Using Clustering
		CO5	Develop Data-Driven Applications Using Social Network Data And Natural Language Processing.

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2018 SCHEME COURSE OUTCOMES

Course Name	Course Code	CO. No.	Course Outcomes
TRANFORM CALCULUS, FOURIER SERIES & NUMERICAL TECHNIQUES	18MAT31	CO1	Have The Knowledge Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Calculus Of Variations And Numerical Methods.
		CO2	Solve Engineering Problems Using Laplace Transforms, Fourier Series, Fourier Transforms, Numerical Methods And Calculus Of Variation.
		CO3	Communicate And Reflect On Applications Of Mathematics As Tool.
DATA STRUCTURES AND APPLICATIONS (18CS32)	18ES32	CO1	Illustrate Various Linear And Non-Linear Data Structures.
		CO2	Use Appropriate Data Structure To Be Applied To Specific Problem.
		CO3	Implement Basic Operations On Various Data Structures.
		CO4	Write Programs For Applications Of Data Structures In A High-Level Language.
ANALOG AND DIGITAL ELECTRONICS	18CS33	CO1	Design And Analyze Application Of Analog Circuits Using Photo Devices, Timer IC, Power Supply And Regulator IC And Op-Amp.
		CO2	Explain The Basic Principles Of A/D And D/A Conversion Circuits And Develop The Same.
		CO3	Simplify Digital Circuits Using Karnaugh Map , And Quine-Mcclusky Methods
		CO4	Explain Gates And Flip Flops And Make Us In Designing Different Data Processing Circuits, Registers And Counters And Compare The Types.
		CO5	Develop Simple HDL Programs
COMPUTER ORGANIZATION	18CS34	CO1	Explain The Basic Organization Of A Computer System.
		CO2	Demonstrate Functioning Of Different Sub Systems, Such As Processor, Input/Output,And Memory.
		CO3	Illustrate Hardwired Control And Micro Programmed Control, Pipelining, Embedded And Other Computing Systems.
		CO4	Design And Analyse Simple Arithmetic And Logical Units.

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SOFTWARE ENGINEERING	18CS35	CO1	Design A Software System, Component, Or Process To Meet Desired Needs Within Realistic Constraints
		CO2	Assess Professional And Ethical Responsibility
		CO3	Function On Multi-Disciplinary Teams
		CO4	Use The Techniques, Skills, And Modern Engineering Tools 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	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 Us 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

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			And Their Applications
		CO3	Implement, Analyze And Evaluate The Searching And Sorting Algorithms
		CO4	Choose The Appropriate Data Structure For Solving Real World Problem
VYAVAHARIKA KANNADA (KANNADA FOR COMMUNICATION)	18KVK39	CO1	At The End Of The Course, The Student Will Be Able To Understand Kannada And Communicate In Kannada Language.
AADALITHA KANNADA (KANNADA FOR ADMINISTRATION)	18KAK39	CO1	At The End Of The Course, The Student Will Be Able To Understand Kannada And Communicate In Kannada Language.
COMPLEX ANALYSIS, PROBABILITY & STATISTICAL METHODS (MATHS)	18MAT41	CO1	Have The Knowledge Of Statistical Methods Complex Variables, Probability, Sampling Theory And Stochastic Process.
		CO2	Compute The Solutions Using Complex Variables, Statistical Methods And Probability, Sampling Theory And Stochastic Process.
		CO3	Interpret The Solutions Using Complex Variables, Statistical Methods And Probability, Sampling Theory And Stochastic Process.
DESIGN & ANALYSIS OF ALGORITHMS (DAA)	18CS42	CO1	Describe The Framework For Performance Analysis Of Algorithms And Define The Limitations Of Algorithmic Power.
		CO2	Develop Algorithms Using Standard Algorithm Design Techniques To Solve Computational Problems.
		CO3	Solve The Various Computational Problems Like Searching, Sorting, Graph, Combinatorial, String Matching Problems By Using Different Algorithms.
		CO4	Examine The Computational Complexity Of Different Algorithms.
		CO5	Apply Backtracking And Branch-And- Bound Techniques To Solve Exponential Growth Problems.
OPERATING SYSTEMS	18CS43	CO1	Describe The Need Of Operating System, Process, Memory Scheduling, Deadlocks And File System Management.

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		CO2	Apply Different Process Scheduling, Deadlock Prevention And Disk Scheduling Algorithms For A Given Problem.
		CO3	Illustrate The Concepts Of Memory Management ,Implementation Of File System And Process Deadlocks.
		CO4	Demonstrate The Secondary Storage Structures And Case Study Of Linux Operating System
MICROCONTROLLER & EMBEDDED SYSTEMS	18CS44	CO1	Describe The Architecture And Working Principles Of ARM And Embedded Systems.
		CO2	Illustrate The Working Of Different ARM Instruction Set.
		CO3	Interpret The Roles Of Embedded Systems For Real Time Applications
		CO4	Identify The Different RTOS , IDE And Attribute Modules For Designing Embedded Systems.
OBJECT ORIENTED CONCEPTS	18CS45	CO1	Illustrate The Object Oriented Programming Features.
		CO2	Implement The Features Of Object Oriented Concepts Using C++/Java.
		CO3	Apply Knowledge Of Inheritance, Exception Handling And Packaging To Build Java Applications.
		CO4	Apply Concepts Of Multi-Threading And Event Handling To Enhance Java Applications.
		CO5	Develop GUI Based Java Applications Using Swings.
DATA COMMUNICATION	18CS46	CO1	Identify The Networking Concepts, Protocols Associated With Wired And Wireless Networks. Level – 2
		CO2	Apply The Different Signal Conversion Methods For The User Defined Data. Level - 3
		CO3	Experiment With Different Error Detection Methods, Addressing And Sub Netting For The Sample Data. Level – 4
		CO4	Analyze The Performance Of The Network And Different Switching Techniques. Level - 4
DESIGN & ANALYSIS OF ALGORITHMS LABORATORY	18CSL47	CO1	Write The Program For The Given Specifications.
		CO2	Demonstrate / Simulate The Experiments With The Given Specification

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		CO3	Tabulate, Validate The Readings And Infer The Results Graphically/Mathematically.
		CO4	Interpret The Concepts And Results Both Orally And Written
MICROCONTRO LLER & EMBEDDED SYSTEMS LABORATORY	18CSL48	CO1	Design/Write The Program For The Given Specifications.
		CO2	Conduct / Demonstrate / Simulate The Experiments With The Given Specification.
		CO3	Tabulate, Validate The Readings And Infer The Results Graphically/Mathematically.
		CO4	Interpret The Concepts And Results Both Orally And Written
MANAGEMENT AND ENTREPRENEUR SHIPFOR IT INDUSTRY	18CS51	C01	Utilize The Concepts Of Managerial Skills That Includes The Functional Areas Of Management, Preparation Of Project, ERP.[L3]
		CO2	Illustrate The Stages In Entrepreneurial Process, Industrial Policies To Set Up Small Scale Industry And Intellectual Property Rights[L3]
		CO3	Analyze The Different Management Functions, Motivational Theories And Entrepreneurial Process Used In Real Time Scenarios.[L4]
PYTHON PROGRAMMING	18AI52	CO1	Illustrate Python Syntax And Semantics, Flow Control, Functions, Retrieval Of Data Using Webscrapping And Usage Of Different File Formats (CSV, JSON, Etc).
		CO2	Develop, Run And Manipulate Python Programs Using Lists, Dictionaries, String Handling Methods, File Operations And Searching Pattern Using Regular Expressions.
		CO3	Interpret The Concepts Of Object Oriented Programming Using Python.
		CO4	Demonstrate Different Python Modules Using Real World Projects. C) Course Assessment Procedure
DATABASE MANAGEMENT SYSTEM	18CS53	CO1	1.Identify, Analyze And Define Database Objects, Enforce Integrity Constraints On A Database Using RDBMS.
		CO2	2.Use Structured Query Language (SQL) For Database Manipulation
		CO3	3.Design And Build Simple Database Systems
		CO4	4.Develop Application To Interact With Databases

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AUTOMATA THEORY AND COMPUTABILITY	18CS54	CO1	1.Acquire Fundamental Understanding Of The Core Concepts In Automata Theory And Theory Of Computation
		CO2	2.Learn How To Translate Between Different Models Of Computation (E.G., Deterministic And Non-Deterministic And Software Models)
		CO3	3.Design Grammars And Automata (Recognizers) For Different Language Classes And Become Knowledgeable About Restricted Models Of Computation (Regular, Context Free) And Their Relative Powers.
		CO4	4.Develop Skills In Formal Reasoning And Reduction Of A Problem To A Formal Model, With An Emphasis On Semantic Precision And Conciseness
		CO5	5.Classify A Problem With Respect To Different Models Of Computation
PRINCIPLES OF ARTIFICIAL INTELLIGENCE	18AI55	CO1	Demonstrate Fundamental Understanding Of Artificial Intelligence (AI) And Expert Systems.
		CO2	Interpret The Basic Principles Of AI In Problem Solving, Inference, Perception, Knowledge Representation, And Learning.
		CO3	Apply The Knowledge Of Artificial Intelligence To Write Simple Algorithm For Agents.
		CO4	Apply The AI Knowledge To Solve Problem On Search Algorithm.
		CO5	Develop Knowledge Base Sentences Using Propositional Logic And First Order Logic To Solve Knowledge Engineering Process.
MATHEMATICS FOR MACHINE LEARNING	18AI56	CO1	Apply The Skills And Analytical Of Linear Algebra To Get More Out Of Machine Learning.
		CO2	Analyze The Design Of Common Machine Learning Techniques Using Vector Calculus.
		CO3	Design The Machine Learning Applications By Learning Probability And Distribution In Statistics.
		CO4	Utilize Basic Theoretical Properties Of Optimization Problems, For Applications In Machine Learning
ARTIFICIAL INTELLIGENCE	18AIL57	CO1	Apply The Conceptual Knowledge Of Python To Develop Solutions For Basic Problems.

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LABORATORY		CO2	Implement And Demonstrate AI Algorithms Using Python Programming.
		CO3	Evaluate Different Algorithms.
DBMS LABORATORY WITH MINI PROJECT	18CSL58	CO1	Write SQL Queries For Manipulation Of Data
		CO2	Design Suitable Applications Using Databases
		CO3	Implement SQL Queries And Applications, Document The Results.
ENVIRONMENTAL STUDIES	18CIV59	CO1	Understand The Principles Of Ecology And Environmental Issues That Apply To Air, Land, And Water Issues On A Global Scale
		CO2	Develop Critical Thinking And/Or Observation Skills, And Apply Them To The Analysis Of A Problem Or Question Related To The Environment.
		CO3	Demonstrate Ecology Knowledge Of A Complex Relationship Between Biotic And Abiotic Components.
		CO4	Apply Their Ecological Knowledge To Illustrate And Graph A Problem And Describe The Realities That Managers Face When Dealing With Complex Issues.
DIGITAL IMAGE PROCESSING	18AI62	CO1	Illustrate The Basics Of Image Processing Concepts Through Mathematical Interpretation.
		CO2	Apply Image Processing Techniques In Both The Spatial And Frequency (Fourier)Domains.
		CO3	Demonstrate Image Restoration Process And Its Respective Filters Required, Processing Of Color Images, Wavelets And Morphological Image Processing
		CO4	Apply Image Analysis Techniques In The Form Of Image Segmentation And To Evaluate The Methodologies For Segmentation.
JAVA FOR MOBILE APPLICATIONS	18AI63	CO1	Interpret The Need For Advanced Java Concepts Like Enumerations And Collections In Developing Modular And Efficient Programs.
		CO2	Analyze The Architecture And Various Application Components In Android.
		CO3	Design Efficient User Interface Using Different Layouts.
		CO4	Apply The Various String Functions In Java To Process The Data In Android Applications

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		CO5	Develop Android Applications With Persistent Data Storage Using Sqlite
FOUNDATION FOR DATA SCIENCE	18AI644	CO1	Apply The Knowledge Of Mathematics To Explain The Concept Of Data Science, The Available Techniques In Data Science And Its Scope In Business
		CO2	Develop A Decision Tree Based On Supervised Segmentation And Predict The Class For A Given Data Set By Selecting (Through Solving) The Attribute For Segmentation Using The Available Techniques.
		CO3	Analyze The Given Data Set, And Solve A Problem By Performing Classification Using The Basics Of Mathematics And Data Science
		CO4	Develop Solutions To Group Entities In Data Set And Apply It For The Given Real-World Data Using The Basic Knowledge Of Similarity, Neighbors And Clustering
		CO5	Analyze The Importance Of Mining Text (Social Data) And Formulate The Association Rules Based On Market Basket Analysis
MACHINE LEARNING LABORATORY	18AIL66	CO1	Implement And Demonstration Of ML Algorithms.
		CO2	Evaluation Of Different Algorithms.
DIGITAL IMAGE PROCESSING LABORATORY WITH MINI PROJECT	18AIL67	CO1	Apply Basic Tools For Image Processing And Perform Basic Image Transformations.
		CO2	Analyze Image Segmentation And Filtering Techniques In Spatial And Frequency Domain.
		CO3	Demonstrate Morphological Operations In Analyzing Image Structures.
		CO4	Develop Real-World Projects Using Image Processing.
MOBILE APPLICATION DEVELOPMENT LABORATORY	18AIL68	CO1	Create, Test And Debug Android Application By Setting Up Android Development Environment.
		CO2	Implement Adaptive, Responsive User Interfaces That Work Across A Wide Range Of Devices.
		CO3	Infer Long Running Tasks And Background Work In Android Applications.
		CO4	Demonstrate Methods In Storing, Sharing And Retrieving Data In Android Applications.

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		CO5	Infer The Role Of Permissions And Security For Android Applications.
INTRODUCTION TO OPERATING SYSTEMS	18AI654	CO1	Illustrate Fundamental Concepts Of Operating System, Its Operations And Services
		CO2	Compare Different Process And Thread Scheduling Algorithms, System Calls And Paging Concepts.
		CO3	Illustrate Synchronisation Mechanisms, Deadlock Avoidance, Recovery And Prevention
		CO4	Analyze And Apply Theory And Implementation Of Process And Threads, Resource Control (Concurrency Etc.), Physical And Virtual Memory, Scheduling, I/O And Files.
ADVANCED ARTIFICIAL INTELLIGENCE	18AI71	CO1	Demonstrate The Fundamentals Of Intelligent Agents
		CO2	Illustrate The Reasoning On Uncertain Knowledge
		CO3	Explore The Explanation Based Learning In Solving AI Problems
		CO4	Demonstrate The Applications Of Rough Sets And Evolutionary Computing Algorithms
ADVANCED MACHINE LEARNING	18AI72	CO1	Utilize Advanced Machine Learning Algorithms, Including Hidden Markov Models, To Forecast Future Trends And Make Accurate Predictions In Time Series Data.
		CO2	Analyze Large Datasets Using Clustering Techniques To Identify Meaningful Patterns And Segments, Enabling Data-Driven Decision-Making In Various Domains.
		CO3	Design And Implement Personalized Recommender Systems By Integrating Collaborative Filtering And Content-Based Methods To Enhance User Experiences And Engagement.
		CO4	Evaluate Text Analytics Approaches To Extract Meaningful Insights, Sentiment Analysis, And Topic Modeling From Unstructured Text Data, Providing Valuable Information For Decision-Makers.

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		CO5	Apply Genetic Algorithms To Optimize Hyper Parameters And Architecture Of Neural Networks, Leading To Efficient And High-Performing Machine Learning Models For Complex Tasks.
BLOCKCHAIN TECHNOLOGY	18AI733	CO1	Elaborate The Basic Principles And Concepts Of Blockchain Technology
		CO2	Understand And Apply Decentralization Principles In Blockchain Technology.
		CO3	Apply The Fundamentals Of Cryptography Algorithms In Blockchain Technology.
		CO4	Analyze Various Cryptocurrencies Like Bitcoin, Ethereum, Smart Contracts And Its Transactions On Blockchain, Along With An Exploration Of Alternative Cryptocurrencies.
		CO5	Analyze The Potential Impact And Challenges In These Areas Of Iot, Governance, Healthcare, Finance, And Media
COMPUTER VISION	18AI742	CO1	Illustrate Fundamental Image Processing Techniques Required For Computer Vision And Understand The Process Of Image Formation.
		CO2	Demonstrate The Fundamentals Of Linear Filters And Convolution, Shift Invariant Linear Systems, Spatial Frequency And Fourier Transforms, Sampling And Aliasing, Filters As Templates, Local Image Features, Texture.
		CO3	Analyze Multiple Images To Extract Depth And 3D Information.
		CO4	Apply Shape Analysis That Relies On Segmentation By Clustering, Grouping And Model Fitting, Tracking And Comprehend Processing And Interpretation Of Visual Information At A More Abstract And Complex Level.
AI AND ML APPLICATION DEVELOPMENT LABORATORY	18AIL76	CO1	Explore The Knowledge Of AI And ML Concepts And Practice To Groom Students Into Well Informed Application Developers.
		CO2	Demonstrate The Knowledge Of Human Cognition, Artificial Intelligence, Machine Learning And Data Engineering For Designing Intelligent

			Systems
		CO3	Apply Computational Knowledge And Project Development Skills To Provide Innovative Solutions.
		CO4	Strong Practice In AI And ML Programming Through A Variety Of AI And ML Problems.
		CO5	Develop AI And ML Applications Using Front-End And Back-End Tools
PROJECT WORK PHASE-1	18AIP77	CO1	Demonstrate An Ability To Identify And Formulate A Hypothesis For A Given Problem And Test Through Appropriate Experiments.
		CO2	Apply Relevant Modern Tools To Solve The Identified Technical Problem.
		CO3	Analyze And Evaluate The Experimental Results And Propose Suitable Modifications To Improve Performance.
		CO4	Work Effectively As A Team Member As Well As A Leader Of A Team.
		CO5	Communicate Technical Content Effectively Through Written Reports And Oral Presentations.
NEURAL NETWORKS AND DEEP LEARNING	18AI81	CO1	Understand The Basics Of Artificial Neural Networks (Anns) And Deep Learning. Understand MLP And DNN Training With Tensorflow
		CO2	Analyze And Address Deep Learning Challenges Like Vanishing Gradients, Overfitting, And Slow Optimization Using Techniques Such As Hyperparameter Tuning And Regularization.
		CO3	Demonstrate Proficiency In Distributing Tensorflow Computations Across Devices And Understand CNN Architecture And Parallelize Neural Networks.
		CO4	Implement Rnns For Sequential Data Tasks And Study LSTM And GRU Cells In Tensorflow For NLP Applications.
		CO5	Apply Autoencoders For Data Representation And Unsupervised Learning. Explore PCA, Denoising, And Different Types Of Autoencoders.
SOFT AND	18AI822	CO1	Understand The Basics Of Neural Networks,

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Course	Code	CO	Description
EVOLUTIONARY COMPUTING			Fuzzy Logic, Genetic Algorithms, And Hybrid Systems, As Well As Classical And Fuzzy Sets, Relations, And Membership Functions.
		CO2	Demonstrate The Concept Of Fuzzification And Defuzzification.
		CO3	Design Genetic Algorithm To Solve The Optimization Problem.
		CO4	Illustrate The Process Of Swarm Intelligence System To Solve Real World Problems.
		CO5	Apply And Analyze The Neuro Fuzzy System For Clustering And Classification.
PROJECT WORK PHASE-2	18AIP83	CO1	Demonstrate An Ability To Identify And Formulate A Hypothesis For A Given Problem And Test Through Appropriate Experiments.
		CO2	Apply Relevant Modern Tools To Solve The Identified Technical Problem.
		CO3	Analyze And Evaluate The Experimental Results And Propose Suitable Modifications To Improve Performance.
		CO4	Work Effectively As A Team Member As Well As A Leader Of A Team.
		CO5	Communicate Technical Content Effectively Through Written Reports And Oral Presentations.
INTERNSHIP	18AII85	CO1	1. Demonstrate An Ability To Identify And Formulate A Hypothesis For A Given Problem And Test Through Appropriate Experiments.
		CO2	2. Apply Relevant Modern Tools To Solve The Identified Technical Problem.
		CO3	3. Analyze And Evaluate The Experimental Results And Propose Suitable Modifications To Improve Performance.
		CO4	4. Work Effectively As A Team Member As Well As A Leader Of A Team.
		CO5	5. Communicate Technical Content Effectively Through Written Reports And Oral Presentations.