



ANGADI INSTITUTE OF TECHNOLOGY AND MANAGEMENT

Savagaon Road, BELAGAVI – 590 009.

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Department of Artificial Intelligence & Data Science (AI & DS)



Subject Code: 21MAT31

Subject Name: Transform Calculus, Fourier Series and Numerical Techniques

Course Code	NBA Code	Course Outcome Description
21MAT31.1	C231.1	To solve ordinary differential equations using Laplace transform.
21MAT31.2	C231.1	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
21MAT31.3	C231.1	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations.
21MAT31.4	C231.1	To solve mathematical models represented by initial or boundary value problems involving partial differential equations.
21MAT31.5	C231.1	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Subject Code: 21CS32

Subject Name: DATA STRUCTURES AND APPLICATIONS

Course Code	NBA Code	Course Outcome Description
21CS32.1	C232.1	Identify different data structures and their applications.
21CS32.2	C232.2	Apply stack and queues in solving problems.
21CS32.3	C232.3	Demonstrate applications of linked list.
21CS32.4	C232.4	Explore the applications of trees and graphs to model and solve the real-world problem.
21CS32.5	C232.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs.



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Subject Code: 21CS33

Subject Name: ANALOG AND DIGITAL ELECTRONICS

Course Code	NBA Code	Course Outcome Description
21CS33.1	C233.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
21CS33.2	C233.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
21CS33.3	C233.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods.
21CS33.4	C233.4	Explain Gates and flip flops and make use in designing different data processing circuits, registers and counters and compare the types.
21CS33.5	C233.5	Develop simple HDL programs.

Subject Code: 21CS34

Subject Name: COMPUTER ORGANIZATION AND ARCHITECTURE

Course Code	NBA Code	Course Outcome Description
21CS34.1	C234.1	Explain the organization and architecture of computer systems with machine instructions and programs.
21CS34.2	C234.2	Analyze the input/output devices communicating with computer system.
21CS34.3	C234.3	Demonstrate the functions of different types of memory devices.
21CS34.4	C234.4	Apply different data types on simple arithmetic and logical unit.
21CS34.5	C234.5	Analyze the functions of basic processing unit, Parallel processing and pipelining.



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Subject Code: 21CSL35

Subject Name: OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY

Course Code	NBA Code	Course Outcome Description
21CSL35.1	C235.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects.
21CSL35.2	C235.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.
21CSL35.3	C235.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object oriented data and document results.
21CSL35.4	C235.4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.
21CSL35.5	C235.5	Develop user friendly applications using File I/O and GUI concepts.

Subject Code: 21CSL381

Subject Name: MASTERING OFFICE

Course Code	NBA Code	Course Outcome Description
21CSL381.1	C2381.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
21CSL381.2	C2381.2	Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker.
21CSL381.3	C2381.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
21CSL381.4	C2381.4	Demonstrate the ability to apply application software in an office environment.
21CSL381.5	C2381.5	Use Google Suite for office data management tasks.



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Subject Code: 21CS42

Subject Name: DESIGN AND ANALYSIS OF ALGORITHMS

Course Code	NBA Code	Course Outcome Description
21CS42.1	C242.1	Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.
21CS42.2	C242.2	Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same.
21CS42.3	C242.3	Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.
21CS42.4	C242.4	Apply and analyze dynamic programming approaches to solve some problems and improve an algorithm time efficiency by sacrificing space.
21CS42.5	C242.5	Apply and analyze backtracking, branch and bound methods and to describe P, NP and NP Complete problems.

Subject Code: 21CS43

Subject Name: MICROCONTROLLER AND EMBEDDED SYSTEMS

Course Code	NBA Code	Course Outcome Description
21CS43.1	C243.1	Explain C-Compilers and optimization
21CS43.2	C243.2	Describe the ARM microcontroller's architectural features and program module.
21CS43.3	C243.3	Apply the knowledge gained from programming on ARM to different applications.
21CS43.4	C243.4	Program the basic hardware components and their application selection method.
21CS43.5	C243.5	Demonstrate the need for a real-time operating system for embedded system applications.



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Subject Code: 21CS44

Subject Name: OPERATING SYSTEMS

Course Code	NBA Code	Course Outcome Description
21CS44.1	C244.1	Identify the structure of an operating system and its scheduling mechanism.
21CS44.2	C244.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
21CS44.3	C244.3	Identify root causes of deadlock and provide the solution for deadlock elimination.
21CS44.4	C244.4	Explore about the storage structures and learn about the Linux Operating system.
21CS44.5	C244.5	Analyze Storage Structures and Implement Customized Case study.

Subject Code: 21BE45

Subject Name: BIOLOGY FOR ENGINEERS

Course Code	NBA Code	Course Outcome Description
21BE45.1	C245.1	Elucidate the basic biological concepts via relevant industrial applications and case studies.
21BE45.2	C245.2	Evaluate the principles of design and development, for exploring novel bioengineering projects.
21BE45.3	C245.3	Corroborate the concepts of biomimetics for specific requirements.
21BE45.4	C245.4	Think critically towards exploring innovative biobased solutions for socially relevant problems.



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Subject Code: 21CSL46

Subject Name: Python Programming Laboratory

Course Code	NBA Code	Course Outcome Description
21CSL46.1	C246.1	Demonstrate proficiency in handling of loops and creation of functions.
21CSL46.2	C246.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
21CSL46.3	C246.3	Discover the commonly used operations involving regular expressions and file system.
21CSL46.4	C246.4	Interpret the concepts of Object-Oriented Programming as used in Python.
21CSL46.5	C246.5	Determine the need for scraping websites and working with PDF, JSON and other file formats.

Subject Code: 21CIP47

Subject Name: Constitution of India and Professional Ethics (CIP)

Course Code	NBA Code	Course Outcome Description
21CIP47.1	C247.1	Demonstrate proficiency in handling of loops and creation of functions.
21CIP47.2	C247.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
21CIP47.3	C247.3	Discover the commonly used operations involving regular expressions and file system.
21CIP47.4	C247.4	Interpret the concepts of Object-Oriented Programming as used in Python.
21CIP47.5	C247.5	Determine the need for scraping websites and working with PDF, JSON and other file formats.



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Subject Code: 21CSL481

Subject Name: WEB PROGRAMMING

Course Code	NBA Code	Course Outcome Description
21CSL481.1	C248.1	Describe the fundamentals of web and concept of HTML.
21CSL481.2	C248.2	Use the concepts of HTML, XHTML to construct the web pages.
21CSL481.3	C248.3	Interpret CSS for dynamic documents.
21CSL481.4	C248.4	Evaluate different concepts of JavaScript & Construct dynamic documents.
21CSL481.5	C248.5	Design a small project with JavaScript and XHTML.

Subject Code: 21UHV49

Subject Name: UNIVERSAL HUMAN VALUES-II

Course Code	NBA Code	Course Outcome Description
21CSL481.1	C249.1	Holistic vision of life
21CSL481.2	C249.2	Socially responsible behaviour
21CSL481.3	C249.3	Environmentally responsible work
21CSL481.4	C249.4	Ethical human conduct
21CSL481.5	C249.5	Having Competence and Capabilities for Maintaining Health and Hygiene
21CSL481.6	C249.6	Appreciation and aspiration for excellence (merit) and gratitude for all



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Subject Code: 21CS51

Subject Name: AUTOMATA THEORY AND COMPILER DESIGN

Course Code	NBA Code	Course Outcome Description
21CS51.1	C351.1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation.
21CS51.2	C351.2	Design and develop lexical analyzers, parsers and code generators.
21CS51.3	C351.3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
21CS51.4	C351.4	Acquire fundamental understanding of the structure of a Compiler and Apply concepts of automata theory and Theory of Computation to design Compilers.
21CS51.5	C351.5	Design computations models for problems in Automata theory and adaptation of such model in the field of compilers.

Subject Code: 21CS52

Subject Name: COMPUTER NETWORKS

Course Code	NBA Code	Course Outcome Description
21CS52.1	C352.1	Learn the basic needs of communication system.
21CS52.2	C352.2	Interpret the communication challenges and its solution.
21CS52.3	C352.3	Identify and organize the communication system network components.
21CS52.4	C352.4	Design communication networks for user requirements.



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Subject Code: 21CS53

Subject Name: DATABASE MANAGEMENT SYSTEMS

Course Code	NBA Code	Course Outcome Description
21CS53.1	C353.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
21CS53.2	C353.2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
21CS53.3	C353.3	Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database.
21CS53.4	C353.4	Develop application to interact with databases, relational algebra expression.
21CS53.1	C353.1	Develop applications using tuple and domain relation expression from queries.

Subject Code: 21AI54

Subject Name: PRINCIPLES OF ARTIFICIAL INTELLIGENCE

Course Code	NBA Code	Course Outcome Description
21AI54.1	C354.1	Apply knowledge of agent architecture, searching and reasoning techniques for different applications.
21AI54.2	C354.2	Analyse Searching and Inferencing Techniques.
21AI54.3	C354.3	Develop knowledge base sentences using propositional logic and first order logic.
21AI54.4	C354.4	Demonstrating agents, searching and inferencing.
21AI54.5	C354.5	Illustrate the application of probability in uncertain reasoning.



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Subject Code: 21CSL55

Subject Name: DATABASE MANAGEMENT SYSTEM LABORATORY WITH MINI PROJECT

Course Code	NBA Code	Course Outcome Description
21CSL55.1	C355.1	Create, Update and query on the database.
21CSL55.2	C355.2	Demonstrate the working of different concepts of DBMS.
21CSL55.3	C355.3	Implement, analyze, and evaluate the project developed for an application.

Subject Code: 21RMI56

Subject Name: RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS

Course Code	NBA Code	Course Outcome Description
21RMI56.1	C356.1	To know the meaning of engineering research
21RMI56.2	C356.2	To know the procedure of literature review and technical reading
21RMI56.3	C356.3	To know the fundamentals of patent laws and drafting procedure
21RMI56.4	C356.4	Understanding copyright laws and subject matters of copyrights and designs
21RMI56.5	C356.5	Understanding the basic principles of design rights

Subject Code: 21CIV57

Subject Name: Environmental Studies

Course Code	NBA Code	Course Outcome Description
21CIV57.1	C357.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
21CIV57.2	C357.2	Develop critical thinking and observation skills and apply them to environmental problem analysis
21CIV57.3	C357.3	Demonstrate ecology knowledge of complex relationships between biotic and abiotic components
21CIV57.4	C357.4	Apply ecological knowledge to illustrate and graph problems and describe real-world management challenges



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Subject Code: 21CSL581

Subject Name: ANGULAR JS

Course Code	NBA Code	Course Outcome Description
21CSL581.1	C3581.1	Develop Angular JS programs using basic features
21CSL581.2	C3581.2	Develop dynamic Web applications using AngularJS modules
21CSL581.3	C3581.3	Make use of form validations and controls for interactive applications
21CSL581.4	C3581.4	Apply the concepts of Expressions, data bindings and filters in developing Angular JS programs
21CSL581.5	C3581.5	Make use of modern tools to develop Web applications



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Subject Code: 21CS61

Subject Name: SOFTWARE ENGINEERING & PROJECT MANAGEMENT

Course Code	NBA Code	Course Outcome Description
21CS61.1	C361.1	Understand the activities involved in software engineering and analyze the role of various process models
21CS61.2	C361.2	Explain the basics of object-oriented concepts and build a suitable class model using modelling techniques
21CS61.3	C361.3	Describe various software testing methods and understand the importance of agile methodology and DevOps
21CS61.4	C361.4	Illustrate the role of project planning and quality management in software development
21CS61.5	C361.5	Understand the importance of activity planning and different planning models

Subject Code: 21AD62

Subject Name: DATA SCIENCE AND ITS APPLICATIONS

Course Code	NBA Code	Course Outcome Description
21AD62.1	C362.1	Identify and demonstrate data using visualization tools.
21AD62.2	C362.2	Make use of Statistical hypothesis tests to choose the properties of data, curate and manipulate data.
21AD62.3	C362.3	Utilize the skills of machine learning algorithms and techniques and develop models.
21AD62.4	C362.4	Demonstrate the construction of decision tree and data partition using clustering.
21AD62.5	C362.5	Experiment with social network analysis and make use of natural language processing skills to develop data driven applications.



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Subject Code: 21AI63

Subject Name: Machine Learning

Course Code	NBA Code	Course Outcome Description
21AI63.1	C363.1	Understand the concept of Machine Learning and Concept Learning.
21AI63.2	C363.2	Apply the concept of ML and various classification methods in a project.
21AI63.3	C363.3	Analyse various training models in ML and the SVM algorithm to be implemented.
21AI63.4	C363.4	Apply the ML concept in a decision tree structure and implementation of Ensemble learning and Random Forest.
21AI63.5	C363.5	Apply Bayes techniques and explore more about the classification in ML.

Subject Code: 21AI641

Subject Name: BUSINESS INTELLIGENCE

Course Code	NBA Code	Course Outcome Description
21AI641.1	C364.1	Apply the basics of data and business to understand Decision Support systems and Business Intelligence framework.
21AI641.2	C364.2	Describe the significance of Computerized Decision Support, apply basics of mathematics to understand the mathematical modeling behind decision support.
21AI641.3	C364.3	Explain Data warehousing, its architecture and Extraction, Transformation, and Load (ETL) Processes.
21AI641.4	C364.4	Analyze the importance of knowledge management and explain its activities, approaches and implementation.
21AI641.5	C364.5	Describe Expert systems and analyze its development, discuss areas suitable for application of expert systems.



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Subject Code: 21AIL66

Subject Name: MACHINE LEARNING LAB

Course Code	NBA Code	Course Outcome Description
21AIL66.1	C366.1	Understand the importance of different classification and clustering algorithms.
21AIL66.2	C366.2	Demonstrate the working of various algorithms with respect to training and test data sets.
21AIL66.3	C366.3	Illustrate and analyze principles of Instance based and Reinforcement learning techniques.
21AIL66.4	C366.4	Elicit the importance and applications of Supervised and unsupervised machine learning.
21AIL66.5	C366.5	Compare and contrast Bayes theorem principles and Q learning approach.

Subject Code: 21AD71

Subject Name: DATA VISUALIZATION

Course Code	NBA Code	Course Outcome Description
21AD71.1	C471.1	Demonstrate the data visualization techniques.
21AD71.2	C471.2	Analyze data represented in the form of graphs & charts.
21AD71.3	C471.3	Experiment with different visualization tools.
21AD71.4	C471.4	Identify geospatial data and interconnection of data.
21AD71.5	C471.5	Make use of the web for data extraction.

Subject Code: 21CS72

Subject Name: CLOUD COMPUTING

Course Code	NBA Code	Course Outcome Description
21CS72.1	C472.1	Understand and analyze various cloud computing platforms and service provider.
21CS72.2	C472.2	Illustrate various virtualization concepts.
21CS72.3	C472.3	Identify the architecture, infrastructure and delivery models of cloud computing.
21CS72.4	C472.4	Understand the Security aspects of CLOUD.
21CS72.5	C472.5	Define platforms for development of cloud applications.



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Subject Code: 21CS735

Subject Name: CLOUD COMPUTING

Course Code	NBA Code	Course Outcome Description
21CS735.1	C473.1	Understand the evolution of IoT, IoT networking components, and addressing strategies in IoT.
21CS735.2	C473.2	Analyze various sensing devices and actuator types.
21CS735.3	C473.3	Demonstrate the processing in IoT.
21CS735.4	C473.4	Apply different connectivity technologies.
21CS735.5	C473.5	Understand the communication technologies, protocols and interoperability in IoT.

Subject Code: 21CS744

Subject Name: ROBOTIC PROCESS AUTOMATION DESIGN AND DEVELOPMENT

Course Code	NBA Code	Course Outcome Description
21CS744.1	C474.1	To Understand the basic concepts of RPA.
21CS744.2	C474.2	To Describe various components and platforms of RPA.
21CS744.3	C474.3	To Describe the different types of variables, control flow and data manipulation techniques.
21CS744.4	C474.4	To Understand various control techniques and OCR in RPA.
21CS744.5	C474.5	To Describe various types and strategies to handle exceptions.