Department Of Artificial Intelligence and Data Science
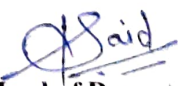## Second Year(2020 Course)

Course Name	Discrete Mathematics	Course Code	210241
CO's No	**CO Statements**		
CO 210241.1	**Formulate** problems precisely, solve the problems, apply formal proof techniques, andexplain the reasoning clearly.		
CO 210241.2	**Apply** appropriate mathematical concepts and skills to solve problems in both familiar andunfamiliar situations including those in real-life contexts.		
CO 210241.3	**Design and analyze** real world engineering problems by applying set theory, propositionallogic and to construct proofs using mathematical induction		
CO 210241.4	**Specify, manipulate and apply** equivalence relations; construct and use functions and applythese concepts to solve new problems.		
CO 210241.5	**Calculate** numbers of possible outcomes using permutations and combinations; to model andanalyze computational processes using combinatorics		
CO 210241.6	**Model and solve** computing problem using tree and graph and solve problems usingappropriate algorithms.		
CO 210241.7	**Analyze** the properties of binary operations, apply abstract algebra in coding theory andevaluate the algebraic structures		

Course Teacher

Prof Gore T. R.

Head of Department

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Course Name	Fundamentals of Data Structures	Course Code	210242
CO's No	**CO Statements**		
CO 210242.1	**Design** the algorithms to solve the programming problems, **identify** appropriate algorithmic strategy for specific application, and **analyze** the time and space complexity .		
CO 210242.2	**Discriminate** the usage of various structures, **Design/Program/Implement** the appropriate data structures; use them in implementations of abstract data types and Identity the appropriate data structure in approaching the problem solution.		
CO 210242.3	**Demonstrate** use of sequential data structures- Array and Linked lists to store and process data .		
CO 210242.4	**Understand** the computational efficiency of the principal algorithms for searching and sorting and choose the most efficient one for the application		
CO 210242.5	**Compare** and **contrast** different implementations of data structures (dynamic and static)..		
CO 210242.6	**Understand, Implement and apply** principles of data structures-stack and queue to solve computational problems.		

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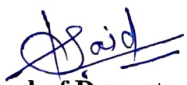Artificial Intelligence and Data Science
Jaihind College of Engineering K

Course Name	Object Oriented Programming(OOP)	Course Code	210243
CO's No	**CO Statements**		
CO 210243.1	**Apply** constructs- sequence, selection and iteration; classes and objects, inheritance, **CO1**use ofpredefined classes from libraries while developing software		
CO 210243.2	**Design** object-oriented solutions for small systems involving multiple objects.		
CO 210243.3	**Use** virtual and pure virtual function and complex programming situations.		
CO 210243.4	**Apply** object-oriented software principles in problem solving.		
CO 210243.5	**Analyze** the strengths of object-oriented programming		
CO 210243.6	**Develop** the application using object oriented programming language(C++).		

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Second Year(2020 Course)

Course Name	Computer Graphics	Course Code	210244
CO's No	**CO Statement**		
CO 210244.1	**Identify** the basic terminologies of Computer Graphics and interpret the mathematical foundation of the concepts of computer graphics.		
CO 210244.2	**Apply** mathematics to develop Computer programs for elementary graphic operations		
CO 210244.3	**Illustrate** the concepts of windowing and clipping and **apply** various algorithms to fill and clip polygons		
CO 210244.4	**Understand** and **apply** the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection.		
CO 210244.5	**Understand** the concepts of color models, lighting, shading models and hidden surface elimination.		
CO 210244.6	**Create** effective programs using concepts of curves, fractals, animation and gaming		

Course Teacher

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Second Year(2020 Course)

Course Name	Operating Systems	Course Code	217521
CO's No	CO Statement		
CO 217521.1	**Enlist** functions of OS and types of system calls		
CO 217521.2	**Apply** process scheduling algorithms to solve a given problem		
CO 217521.3	**Illustrate** deadlock prevention, avoidance and recovery		
CO 217521.4	**Explain** memory management technique		
CO 217521.5	**Illustrate** I/O and file management policies		
CO 217521.6	**Describe** Linux process management		

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Course Name	Operating Systems Laboratory	Course Code	217524

CO's No	CO Statement
CO 217524.1	Choose the best CPU scheduling algorithm for a given problem instance
CO 217524.2	Demonstrate interprocess communication
CO 217524.3	Apply deadlock avoidance algorithm
CO 217524.4	Compare performance of page replacement algorithms
CO 217524.5	Demonstrate the fundamental UNIX commands & system calls

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Second Year(2020 Course)

Course Name	OOP and Computer Graphics Laboratory	Course Code	217523
CO's No	CO Statement		
CO 217523.1	**Understand** and **apply** the concepts like inheritance, polymorphism, exceptionhandling and generic structures for implementing reusable programming codes.		
CO 217523.2	**Analyze** the concept of file and **apply** it while storing and retrieving the data fromsecondary storages.		
CO 217523.3	**Analyze** and **apply** computer graphics algorithms for line-circle drawing, scanconversion and filling with the help of object oriented programming concepts.		
CO 217523.4	**Understand** the concept of windowing and clipping and **apply** various algorithms tofill and clip polygons.		
CO 217523.5	**Apply** logic to implement, curves, fractals, animation and gaming programs		

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Course Name	Data Structures Laboratory	Course Code	217522
CO's No	**CO Statement**		
CO 217522.1	**Use** algorithms on various linear data structure using sequential organization to solve real lifeproblems.		
CO 217522.2	**Analyze** problems to **apply** suitable searching and sorting algorithm to various applications		
CO 217522.3	**Analyze** problems to **use variants of** linked list and solve various real life problems		
CO 217522.4	Designing and implement data structures and algorithms for solving different kinds ofproblems		

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Artificial Intelligence and Data Sci...
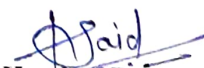Jaihind College of Engineering,K.
Tal.Junnar,Dist.Pune-410511

Department Of Artificial Intelligence and Data Science
Second Year(2020 Course)

Course Name	Business Communication Skills	Course Code	217525
CO's No	CO Statement		
CO 217525.1	Express effectively through verbal/oral communication and improve listening skills		
CO 217525.2	Write precise briefs or reports and technical documents.		
CO 217525.3	Prepare for group discussion / meetings / interviews and presentations.		
CO 217525.4	Explore goal/target setting, self-motivation and practicing creative thinking		
CO 217525.5	Operate effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership qualities		

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Course Name	Humanity and Social Science	Course Code	217526
CO's No	**CO Statement**		
CO 217526.1	Aware of the various issues concerning humans and society.		
CO 217526.2	Aware about their responsibilities towards society.		
CO 217526.3	Sensitized about broader issues regarding the social, cultural, economic and human aspects, involved in social changes		
CO 217526.4	Able to understand the nature of the individual and the relationship between self and thecommunity.		
CO 217526.5	Able to understand major ideas, values, beliefs, and experiences that have shaped humanhistory and cultures		

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Department Of Artificial Intelligence and Data Science
Second Year(2020 Course)

Course Name	Audit Course 3:Smart Cities	Course Code	217527-IV
CO's No	CO Statement		
CO 217527-IV .1	**Understand** the dynamic behavior of the urban system by going beyond the physicalappearance and by focusing on representations, properties and impact factors		
CO 217527-IV .2	**Explore** the city as the most complex human-made organism with a metabolism that canbe modeled in terms of stocks and flows		
CO 217527-IV .3	**Knowledge** about data-informed approaches for the development of the future city, basedon crowd sourcing and sensing		
CO 217527-IV .4	**Knowledge** about the latest research results in for the development and management offuture cities		
CO 217527-III .5	**Understand** how citizens can benefit from data-informed design to develop smart andresponsive cities		

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Artificial Intelligence and Data Science
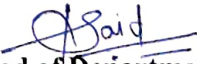Jaihind College of Engineering
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Course Name	Audit Course 3: Green Construction and Design	Course Code	217527-I
CO's No	**CO Statement**		
CO 217527-I .1	**Understand** the importance of environment friendly society.		
CO 217527-I .2	**Apply** primary measures to reduce carbon emissions from their surroundings.		
CO 217527-I .3	**Learn** role of IT solutions in design of green buildings		
CO 217527-I .4	**Understand** the use of software systems to complete statutory compliances involved in thedesign of a new home or office building through green construction		

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Course Name	Audit Course 3: Social Awareness and Governance Program	Course Code	217527-II
CO's No	CO Statement		
CO 217527-II .1	**Understand** social issues and responsibilities as member of society.		
CO 217527-II .2	**Apply** social values and ethics in decision making at social or organizational level		
CO 217527-II .3	**Promote** obstacles in national integration and role of youth for National Integration		
CO 217527-II .4	**Demonstrate** basic features of Indian Constitution		

Course Teacher

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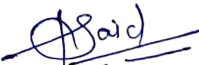
Course Name	Audit Course 3: Environmental Studies	Course Code	217527-III
CO's No	**CO Statement**		
CO 217527-III.1	**Comprehend** the importance of ecosystem and biodiversity		
CO 217527-III.2	**Correlate** the human population growth and its trend to the environmental degradationand develop the awareness about his/her role towards environmental protection and prevention		
CO 217527-III.3	**Identify** different types of environmental pollution and control measures		
CO 217527-III.4	**Correlate** the exploitation and utilization of conventional and non-conventional resources		

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Course Name	Audit Course 3: Foreign Language- Japanese (Module 1)	Course Code	217527-V
CO's No	**C O Statement**		
CO 217527-V 1	Will have ability of basic communication		
CO 217527-V 2	Will have the knowledge of Japanese script		
CO 217527-V 3	Will get introduced to reading, writing and listening skills		
CO 217527-V 4	Will develop interest to pursue professional Japanese Language course		

Course Teacher

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Course Name	Statistics		Course Code	217528
CO's No	**CO Statement**			
CO 217528.1	Identify the use of appropriate statistical terms to describe data			
CO 217528.2	Use appropriate statistical methods to collect, organize, display, and analyze relevantdata.			
CO 217528.3	Use distribution functions for random variables			
CO 217528.4	Distinguish between correlation coefficient and regression			
CO 217528.5	Understand tests for hypothesis and its significance			

Course Teacher
Prof. Gore J.A

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Course Name	Internet of Things	Course Code	217529

CO's No	CO Statement
CO 217529.1	Have a thorough understanding of the structure, function and characteristics of computer systems and Understand the structure of various number systems and its application in digital design.
CO 217529.2	Develop the skill set to build IoT systems and sensor interfacing
CO 217529.3	Explain the concept of Internet of Things and identify the technologies that make up the internet of things
CO 217529.4	Analyze trade-offs in interconnected wireless embedded device networks. Select Appropriate Protocols for IoT Solutions
CO 217529.5	Design a simple IoT system comprising sensors by analyzing the requirements of IoT Application
CO 217529.6	Identify the Application of IoT in automation of Commercial and Real World examples

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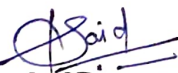Jaihind College of Engineering,Kuran
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Department Of Artificial Intelligence and Data Science
Second Year(2020 Course)

Course Name	Data Structures and Algorithms	Course Code	210252
CO's No	**CO Statement**		
CO 210252.1	**Identify and articulate** the complexity goals and benefits of a good hashing scheme for real-world applications.		
CO 210252.2	**Apply** non-linear data structures for solving problems of various domain		
CO 210252.3	**Design and specify** the operations of a nonlinear-based abstract data type and implement themin a high-level programming language		
CO 210252.4	**Analyze** the algorithmic solutions for resource requirements and optimization		
CO 210252.5	**Use** efficient indexing methods and multiway search techniques to store and maintain data.		
CO 210252.6	**Use** appropriate modern tools to understand and analyze the functionalities confined to thesecondary storage.		

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Course Name	Management Information Systems	Course Code	217530
CO's No	**CO Statement**		
CO 217530.1	**Explain** the concepts of Management Information System and Business intelligence for MIS.		
CO 217530.2	**Illustrate** the need of information systems in global business and ethical issues		
CO 217530.3	**List** the IT infrastructure components and **explain** security in the Information System		
CO 217530.4	**Demonstrate** the importance of project management and **extend** its use in the internationalinformation system.		
CO 217530.5	**Illustrate** the concepts of decision support systems for business applications.		
CO 217530.6	**Relate** artificial intelligence and data science for Management Information System.		

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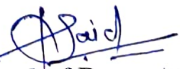| Course Name	Internet of Things Laboratory	Course Code	217531
CO's No	**CO Statement**		
CO 217531.1	Understand IOT Application Development using Raspberry Pi/ Beagle board/ Arduino board		
CO 217531.2	Develop and modify the code for various sensor based applications using wireless sensor modules and working with a variety of modules like environmental modules.		
CO 217531.3	Make use of Cloud platform to upload and analyse any sensor data		

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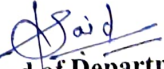| Course Name	Data Structures and Algorithms Laboratory	Course Code	217532
CO's No	**CO Statement**		
CO 217532.1	**Understand** the ADT/libraries, hash tables and dictionary to design algorithms for aspecific problem.		
CO 217532.2	Choose most appropriate data structures and **apply** algorithms for graphical solutions ofthe problems.		
CO 217532.3	**Apply** and **analyze** non linear data structures to solve real world complex problems.		
CO 217532.4	**Apply** and **analyze** algorithm design techniques for indexing, sorting, multi-waysearching, file organization and compression.		
CO 217532.5	**Analyze** the efficiency of most appropriate data structure for creating efficientsolutions for engineering design situations.		

Course Teacher

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Department Of Artificial Intelligence and Data Science
Second Year(2020 Course)

Course Name	Project Based Learning II	Course Code	217533

CO's No	CO Statement
CO 217533.1	Identify the real life problem from societal need point of view
CO 217533.2	Choose and compare alternative approaches to select most feasible one
CO 217533.3	Analyze and synthesize the identified problem from technological perspective
CO 217533.4	Design the reliable and scalable solution to meet challenges
CO 217533.5	Evaluate the solution based on the criteria specified
CO 217533.5	Inculcate long life learning attitude towards the societal problems

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Course Name	Software Engineering	Course Code	210253
CO's No	**CO Statement**		
CO 210253.1	**Analyze** software requirements and formulate design solution for a software.		
CO 210253.2	**Design** applicable solutions in one or more application domains using software engineeringapproaches that integrate ethical, social, legal and economic concerns.		
CO 210253.3	**Apply** new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuousprofessional development.		
CO 210253.4	**Model** and design User interface and component-level		
CO 210253.5	**Identify** and handle risk management and software configuration management		
CO 210253.6	**Utilize** knowledge of software testing approaches, approaches to verification and validation.		
CO 210253.7	**Construct** software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain efficient, reliable, robust and cost-effective software solutions.		

Course Teacher

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Course Name	Audit Course 4: Foreign Language (Japanese) Module 2	Course Code	217535-V
CO's No	**CO Statement**		
CO 217535-V .1	To meet the needs of ever growing industry with respect to language support.		
CO 217535-V.2	To get introduced to Japanese society and culture through language.		

Course Teacher

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Department Of Artificial Intelligence and Data Science
Second Year(2020 Course)

Course Name	Audit Course 4:Intellectual Property Rights and Patents	Course Code	217535-II
CO's No	**CO Statement**		
CO 217535-II.1	**Understand** the fundamental legal principles related to confidential information,copyright. patents. designs. trademarks and unfair competition		
CO 217535-II.2	**Identify, apply** and **assess** principles of law relating to each of these areas ofintellectual property		
CO 217535-II.3	**Apply** the appropriate ownership rules to intellectual property you have been involvedin creating		

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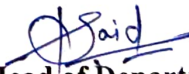| Course Name	Audit Course 4:Water Management	Course Code	217535-I
CO's No	**CO Statement**		
CO 217535-I.1	**Understand** the global water cycle and its various processes		
CO 217535-I.2	**Understand** climate change and their effects on water systems		
CO 217535-I.3	**Understand** Drinking treatment and quality of groundwater and surface water		
CO 217535-I.4	**Understand** the Physical, chemical, and biological processes involved in watertreatment and distribution		

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Course Name	Code of Conduct	Course Code	217534
CO's No	**CO Statement**		
CO 217534 .1	**Understand** the basic perception of profession, professional ethics, various moral and social issues, industrial standards, code of ethics and role of professional ethics in engineering field		
CO 217534.2	**Aware** of professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis		
CO 217534.3	**Understand** the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development		
CO 217534.4	**Acquire** knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.		

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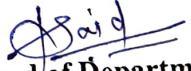Jaihind College of Engineering, Kuran
Tal.Junnar, Dist.Pune-410511

Course Name	Audit Course 4: Yoga and Meditation	Course Code	217535-IV
CO's No	**CO Statement**		
CO 217535-IV.1	**Understand** philosophy and religion as well as daily life issues will be challenged andenhanced.		
CO 217535-IV.2	**Enhances** the immune system		
CO 217535-IV.3	Intellectual and philosophical understanding of the theory of yoga and basic relatedHindu scriptures will be developed.		
CO 217535-IV.4	Powers of concentration, focus, and awareness will be heightened		

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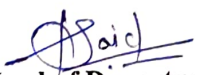| Course Name	Audit Course 4:The Science of Happiness	Course Code	217535-III
CO's No	**CO Statement**		
CO 217535-III: .1	**Understand** what happiness is and why it matters to you		
CO 217535-III: .2	**Learn** how to increase your own happiness		
CO 217535-III: .3	**Understand** of the power of social connections and the science of empathy		
CO 217535-III: .4	**Understand** of the power of social connections and the science of empathy		

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