

Savitribai Phule Pune University
Third Year of Artificial Intelligence and Data Science (2019 Course)
(With effect from Academic Year 2022-23)

Semester-V

Course Code	Course Name	Course Outcomes <i>(On completion of the course, learner will be able to-)</i>
310241	Data Base Management System	C01: Analyze and design Database Management System using ER model C02: Implement database queries using database languages C03: Normalize the database design using normal forms C04: Apply Transaction Management concepts in real-time situations C05: Use NoSQL databases for processing unstructured data C06: Differentiate between Complex Data Types and analyze the use of appropriate data types
317521	Computer Networks	C01: Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies C02: Analyze the working of physical layer protocols. C03: Analyze the working of different routing protocols and mechanisms C04: Implement client-server applications using sockets C05: Illustrate role of application layer with its protocols, client-server architectures C06: Summarize the concepts of MAC and ethernet.
310252	Web Technology	C01: Implement and analyze behaviour of web pages using HTML and CSS C02: Apply the client-side technologies for web development C03: Analyze the concepts of Servlet and JSP C04: Analyze the Web services and frameworks C05: Apply the server-side technologies for web development C06: Create the effective web applications for business functionalities using latest web development platforms
310253:	Artificial Intelligence	C01: Identify and apply suitable Intelligent agents for various AI applications C02: Build smart system using different informed search / uninformed search or heuristic approaches C03: Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem C04: Apply the suitable algorithms to solve AI problems C05: Implement ideas underlying modern logical inference systems C06: Represent complex problems with expressive yet carefully constrained language of representation
310245	Elective-I (B) Human Computer Interface	C01: Design effective Human-Computer-Interfaces for all kinds of users C02: Apply and analyze the user-interface with respect to golden rules of interface C03: Analyze and evaluate the effectiveness of a user-interface design C04: Implement the interactive designs for feasible data search and retrieval C05: Analyze the scope of HCI in various paradigms like ubiquitous computing, virtual reality, multi-media, World wide web related environments C06: Analyze and identify user models, user support, and stakeholder requirements of HCI systems
317523	Software Laboratory I	C01: Implement SQL queries for given requirements, using different SQL concepts C02: Implement NoSQL queries using MongoDB C03: Design and develop application using database considering specific requirements C04: Design a system using different informed search / uninformed search or heuristic approaches C05: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. C06: Design and develop an interactive AI application
317524	CN Laboratory	C01: Analyze the requirements of network types, topology and transmission media C02: Demonstrate error control, flow control techniques and protocols and analyze them C03: Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms

		C04: Develop Client-Server architectures and prototypes C05: Implement web applications and services using application layer protocols
317525	Elective I Laboratory	C01: To design effective Human-Computer-Interfaces for all kinds of users C02: To apply and analyze the user-interface with respect to golden rules of interface C03: To implement the interactive designs for feasible data search and retrieval
317526	Seminar and Technical Communication	C01: Analysis specialized topic of interest from core area C02: Enhance Technical writing skills C03: Targeting specific problem and identify working solution to resolve it. C04: Developing professional communication skill
317527	Environmental Studies	C01: Aware the importance of environment C02: Understand the water pollution C03: Know the Air and noise pollution C04: Understand the E-waste and green computing

Semester-VI

Course Code	Course Name	Course Outcomes <i>(On completion of the course, learner will be able to-)</i>
317529	Data Science	C01: Analyze needs and challenges for Data Science C02: Apply statistics for Data Analytics C03: Apply the lifecycle of Data analytics to real world problems C04: Implement Data Analytics using Python programming C05: Implement data visualization using visualization tools in Python programming C06: Design and implement Big Databases using the Hadoop ecosystem
317530	Cyber security	C01: Gauge the security protections and limitations provided by today's technology. C02: Identify cyber security threats. C03: Analyze threats in order to protect or defend it in cyberspace from cyber-attacks. C04: Build appropriate security solutions against cyber-attacks
317531	Artificial Neural Network	C01: Understand the basic features of neural systems and be able to build the neural model. C02: Perform the training of neural networks using various learning rules. C03: Grasping the use of Associative learning Neural Network C04: Describe the concept of Competitive Neural Networks C05: Implement the concept of Convolutional Neural Networks and its models C06: Use a new tool /tools to solve a wide variety of real-world problems
317532	Elective-II (C) Cloud Computing	C01: Understand the different Cloud Computing environment C02: Use appropriate data storage technique on Cloud, based on Cloud application C03: Analyze virtualization technology and install virtualization software C04: Develop and deploy applications on Cloud C05: Apply security in cloud applications C06: Use advance techniques in Cloud Computing
317533	Software Laboratory II	C01: Model artificial Neural Network, and to analyze ANN learning, and its applications C02: Perform Pattern Recognition, Linear classification. C03: Develop different single layer/multiple layer Perception learning algorithms C04: Design and develop applications using neural networks.
317534	Software Laboratory III	C01: Apply principles of Data Science for the analysis of real time problems C02: Implement data representation using statistical methods C03: Implement and evaluate data analytics algorithms C04: Perform text preprocessing C05: Implement data visualization techniques C06: Use cutting edge tools and technologies to analyze Data
317535	Internship	C01: To demonstrate professional competence through industry internship. C02: To apply knowledge gained through academics to a professional environment during internship. C03: To select appropriate technology and tools to solve a given real time problem. C04: To demonstrate abilities of a responsible professional and use ethical practices in day today life.

		<p>CO5: To create professional and social network and develop relationships with industry people and get exposure to future employers.</p> <p>CO6: To explore various career opportunities in different domains and decide career goals.</p>
317536	<p>Mini Project (CS and Elective-II)</p>	<p>PART A: Cyber Security</p> <p>CO1: Identify basic security attacks and services</p> <p>CO2: Analyze the vulnerabilities and design a security solution.</p> <p>CO3: Implement symmetric and asymmetric key algorithms</p> <p>CO4: Demonstrate network security applications, Firewall, IDs.</p> <p>PART B: Elective-II(C) Cloud Computing</p> <p>CO1: Understanding of AWS environment.</p> <p>CO2: Understand Amazon RDS</p> <p>CO3: Understand and use of AWS LightSail</p>