Savitribai Phule Pune University

Final Year (B.E) of Artificial Intelligence and Machine Learning (2020 Course)

(With effect from Academic Year 2023-24)

Semester-VII

Course Code	Course Name	Course Outcomes *(On completion of the course, learner will be able to–)*
418541	Information Retrieval in AI	**CO1.** Understand the concept of Information retrieval and to apply clustering in information retrieval. **CO2.** Use an indexing approach for retrieval of text and multimedia data. **CO3.** Evaluate the performance of information retrieval systems. **CO4.** Apply the concepts of multimedia and distributed information retrieval. **CO5.** Use appropriate tools in analyzing web information. **CO6.** Simulate the working of a search engine.
418542	Cloud Computing	**CO1:** Explore the fundamentals of cloud computing. **CO2:** Illustrate cloud-enabling technology. **CO3:** Discuss cloud services types and providers. **CO4:** Discuss data storage in the cloud. **CO5:** Explore cloud security mechanisms. **CO6:** Examine common standards in cloud computing.
418543	Deep Learning for AI	**CO1:** Comprehend the theoretical foundations, algorithms, and methodologies of Deep Learning. **CO2:** Apply the concepts of Convolution Neural Networks and use of popular CNN architectures. **CO3:** Compare Feed Forward Neural Networks and Recurrent Neural Networks and learn modelling the time dimension using RNN and LSTM. **CO4:** Elaborate unsupervised deep learning algorithms like Auto-encoders. **CO5:** Explore Representation Learning and Transfer Learning techniques using variants of CNN architecture. **CO6:** Evaluate the performance of deep learning algorithms and provide solutions to various real-world applications.
418544 (B)	Blockchain Technology	**CO1:** Comprehend the Fundamental of cryptography and decentralization. **CO2:** Acquire fundamental knowledge of blockchain with issues associated with it. **CO3:** Acquire knowledge of the Ethereum blockchain platform. **CO4:** Apprehend the hyper ledger fabric platform. **CO5:** Acquire knowledge regarding the working of tokenization. CO6. Describe the applications and risks involved
418545 (A)	Ethical Hacking and Cyber Forensics	**CO1:** Identify Ethical hacking attempts and understand the cyber forensics processes. **CO2:** Recognize Scanning techniques, penetration testing process and apply in real time applications **CO3:** Build knowledge about Meta sploit tool with Kali Linux **CO4:** Construct Secure Web Applications to understand Hacking Techniques. **CO5:** Differentiate Digital Forensics, Network Forensics & Mobile Device Forensics CO6. Identify Future Emerging Technologies and Forensic Laws
418546	Information Retrieval in AI Laboratory	**CO1:** Understand the concept of Information retrieval and to apply clustering in information retrieval. **CO2:** Use appropriate indexing approach for retrieval of text and multimedia data. Evaluate the performance of information retrieval systems. **CO3:** Apply appropriate tools in analyzing the web information. **CO4:** Map the concepts of the subject on recent developments in the Information retrieval field.
418547	Deep Learning for AI Laboratory	**CO1:** Learn and Use various Deep Learning tools and packages. **CO2:** Build and train deep Neural Network models for use in various applications. **CO3:** Apply Deep Learning techniques like CNN and RNN Auto encoders to solve real word Problems. **CO4:** Evaluate the performance of the model built using Deep Learning.

418548	Project Stage I	**CO1.** Apply knowledge of mathematics, science, and engineering to formulate the Problem statement. **CO2.** Design and conduct experiments, as well as to analyse and interpret data. **CO3.** Comprehend professional and ethical responsibility. **CO4.** Communicate effectively. **CO5.** Acquire broad education which is necessary to understand the impact of engineering solutions in global, economic, environmental, and societal context. **CO6.** Recognize of the need for an ability to engage in life-long learning. **CO7.** Use the techniques, skills, and modern engineering tools necessary for engineering practices. **CO8.** Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
418549 (C)	Audit Course 7	**CO1:** Understand how to improve writing skills and level of readability. **CO2:** Identify and categorize what to write in each section. **CO3:** Ensure the good quality of paper at very first-time submission.

Semester-VIII

Course Code	Course Name	Course Outcomes *(On completion of the course, learner will be able to–)*
418550	Natural Language Processing	**CO1:** Describe the fundamental concepts of NLP, challenges and issues in NLP. **CO2:** Analyze Natural languages morphologically, syntactical and semantically **CO3:** Illustrate various language modelling techniques **CO4:** Integrate the NLP techniques for the information retrieval task. **CO5:** Demonstrate the use of NLP tools and techniques for text-based processing of natural languages. **CO6:** Develop real world NLP applications.
418551 (B)	Software Project Management	**CO1:** Apply the practices and methods for successful Software Project Management. **CO2:** Use various tools of Software Project Management. **CO3:** Create Design and Evaluate Project. **CO3:** Analyze Project Schedule and calculate Risk Management with help of tools. **CO4:** Demonstrate different tools used for Project Tracking, Monitoring & Control. **CO5:** Analyze a case study for a distributed team and comment. **CO6:** Discuss and use modern tools for Software Project Management.
418552 (B)	Big Data Analytics	**CO1:** Identify Big Data and its Business Implications. **CO2:** List the components of Hadoop and Hadoop Eco-System **CO3:** Manage Job Execution in Hadoop Environment **CO4:** Develop Big Data Solutions using Hadoop Eco System **CO5:** Apply Machine Learning Techniques using R. **CO6:** Analyze Infosphere Big Insights Big Data Recommendations.
418553	Startup and Entrepreneurship	**CO1:** To understand key concepts and framework of innovation and start-up ecosystem. **CO2:** To gain knowledge of how to develop start up ecosystem, its key components and how to influence and manage dynamics between them and increase the productivity of ecosystem. **CO3:** To understand the role of different stakeholders in ecosystem in building and supporting growth of start- ups. **CO4:** To have insight into global trend in start-up ecosystem and product development. **CO5:** To map different start-up ecosystems and developing performance indicators.
418554	Natural Language Processing Laboratory	**CO1:** Apply basic principles of elective subjects to problem solving and modeling. **CO2:** Use tools and techniques in the area of software development to build mini projects **CO3:** Design and develop applications on subjects of their choice. **CO4:** Generate and manage deployment, administration & security.
418555	Big Data Analytics Laboratory	**CO1:** Write case studies in Business Analytic and Intelligence using mathematical models. **CO2:** Present a survey on applications for Business Analytic and Intelligence. **CO3:** Provide problem solutions for multi-core or distributed, concurrent/Parallel environments.

418556	Project Stage-II	**CO1:** To apply engineering and mathematical knowledge to investigate / select proper technology / Algorithm suitable to solve the problem in hand. **CO2:** To apply knowledge of statistics for analysis of results and express conclusion and justification for the same. **CO3:** To design and conduct experiments, as well as to analyze and interpret data or develop prototype model of the application. **CO4:** To communicate effectively. **CO5:** Get broad education which is necessary to understand the impact of engineering solutions in a global, economic, environmental, ethically and societal context. **CO6:** Recognition of the need for, and an ability to engage in life-long learning.
418557 (B)	Audit Course 8	**CO1.** Understand the importance of the IT Act. **CO2.** Understand the significance of cyber laws and their practices. **CO3.** Identify and Analyze software vulnerabilities and security solutions to reduce the risk of exploitation. **CO4.** To study various privacy and security concerns of Online social media.