Quantum University, Roorkee

Course Outcomes for the Syallbus 2022-24 Batch

Program Nam **Master of Computer Applications**

Course Name **Artificial Intelligence and Expert Systems**

Course Code **CA4101**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	understand the concepts of artificial intelligence. Students will also learn the various searching methods.	2	Emp
CO2	understand various types of knowledge representation techniques required in artificial intelligent machines.	2	S
CO3	understand Weak , and , Strong Slot Filler Structures like semantic networks , cd etc	2	S
CO4	understand about the various methods of reducing the search path in game playing.	2	En
CO5	understand about different types of learning methods and will also study about expert system and its working.	1	None

Course Name **Linux Administration and Network Programming**

Course Code **CA4102**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (Use , for more than One)
CO1	Students should be able to make appropriate decisions during the configuration process to create a properly functioning Linux environment.	3	s
CO2	Students should be able to Use programs and utilities to administer a Linux machine.	3	Emp
CO3	Students should be able to Explain how a Linux server can be integrated within a multi-platform environment.	2	Emp
CO4	Students should be able to Analyze the need for security measures for a Linux environment.	2	Emp

CO5	Students should be able to Identify the different uses and advantages of Linux in a business environment in order to participate in discussions regarding network servers and services.	2	**Emp**

Course Name **Programming In Java**
Course Code **CA4103**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (Use , for more than One)
CO1	Students should be able to understand the use of OOPs concepts.	2	s
CO2	Students should be able to solve real world problems using OOP techniques.	3	**Emp**
CO3	Students should be able to develop and understand exception handling, multithreaded applications with synchronization.	3	**Emp**
CO4	Students should be able to design GUI based applications	3	**Emp**
CO5	Students should be able to understand the use of File I/O.	3	**Emp**

Course Name **Software Engineering**
Course Code **CA4104**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Student should be able to understand the basic concepts of Software Engineering.	2	s
CO2	Student should be able to understand the requirements analysis and design	2	S
CO3	Student should be able to understand software testing strategies and tactics	2	Emp
CO4	Student should be able to understand about software project management, estimation and scheduling	3	Emp

| CO5 | Student should be able to understand about software quality, change and risk management | 3 | Emp |

| Course Name | Linux Administration and Network Programming Lab |
| Course Code | CA4140 |

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Make appropriate decisions during the configuration process to create a properly functioning Linux environment	2	S
CO2	Students should be able to Analyze the need for security measures for a Linux environment.	3	Emp
CO3	Students should be able to Demonstrate the role and responsibilities of a Linux system administrator.	3	Emp

| Course Name | Programming in Java Lab |
| Course Code | CA4141 |

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to use Object Oriented Programming concepts for problem solving.	3	Emp
CO2	Students should be able to Apply JDBC to provide a program level interface for communicating with database using java programming	3	Emp
CO3	Students should be able to Apply the garbage collection for saving the resources automatically	3	Emp

| Course Name | Automata Theory |
| Course Code | CA4201 |

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Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Student should be able to explain basic models of computation, Introduce concepts in automata theory and theory of computation.	3	s
CO2	Student should be able to Identify different formal language classes and their relationships, to design grammars and automata (recognizers) for different language classes	3	S
CO3	Student should be able to Synthesize finite and pushdown automata with specific properties, Prove particular problems cannot be solved by finite or pushdown automata using the Pumping Lemma or the closure properties of regular and/or context-free languages	3	Emp
CO4	"Student should be able to design deterministic Turing machine for all inputs and all outputs, subdivide problem space based on input subdivision using constraints	2	Emp
CO5	Student should be able to Determine the decidability and intractability of computational problems, a fundamental understanding of core concepts relating to the theory of computation and computational models including decidability and intractability	2	Emp

Course Name   **Advanced Java**
Course Code   **CA4202**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs	2	s
CO2	Students should be able to Build client-server applications and TCP/IP socket programs	2	Emp

CO3	Students should be able to Describe the working of string methods	2	Emp
CO4	Students should be able to Illustrate database access and details for managing information using the JDBC API	3	Emp
CO5	Students should be able to Describe how servlets fit into Java-based web application architecture	3	Emp

Course Name   **Python Programming**
Course Code   **CA4203**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Setting up the Python environment	2	S
CO2	Students should be able to understand the concept of Functions	3	S
CO3	Students should be able to understand the concepts of lists, dicts, sets and files	3	Emp
CO4	Students should be able to understand the concept of Data Preprocessing	2	Emp
CO5	Students should be able to understand the concept of Statistical modeling	3	Emp

Course Name   **Advanced Java Lab**
Course Code   **CA4240**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Explore Exception Handling	3	S
CO2	Manipulate Window Interfaces Using Swing Objects	3	S
CO3	write Programs with Graphics Objects	3	Emp

Course Name   **Python Programming Lab**
Course Code   **CA4241**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to To acquire programming skills in core Python. To acquire Object Oriented Skills in Python	2	Emp
CO2	Students should be able to To develop the skill of designing Graphical user Interfaces in Python	2	Emp
CO3	Students should be able to To develop the ability to write database applications in Python	2	Emp

Course Name **Data Visualization and Machine Learning Models**
Course Code **CA4301**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Design and create data visualizations	3	Emp
CO2	Students should be able to Conduct exploratory data analysis using visualization	3	Emp
CO3	Students should be able to Craft visual presentations of data for effective comm.	3	Emp
CO4	Students should be able to Apply data transformations such as aggregation and	3	Emp
CO5	Students should be able to understand the role of Machine Learning in data science	3	Emp

Course Name **PHP and MYSQL**
Course Code **CA4308**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Understanding the basic concepts of PHP and its applications	2	s
CO2	Students should be able to Demonstrate various MySQL database queries.	3	s
CO3	Students should be able to Demonstrate backup and restore a MySQL database.	3	Emp
CO4	"Students should be able to Demonstrate the concepts of server-side webapplications.	3	Emp
CO5	Students should be able to Demonstrate the implementation of PHP into current HTML basedwebsites	3	Emp

Course Name	**Data Visualization and Machine Learning Models Lab**
Course Code	**CA4350**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to apply Decision tree, Neural Networks and Bayesian classifier for determining accuracy using appropriate data sets.	3	Emp
CO2	Students should be able to implement k-nearest neighbor, Regression algorithm and SVM's using real life examples.	3	Emp
CO3	Students should be able to demonstrate working of Random Forest algorithm using suitable training and testing datasets.	3	Emp

Course Name	**PHP and MYSQL Lab**
Course Code	**CA4343**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.	3	Emp

CO2	Students should be able to Analyze the basic structure of a PHP web application and be able to install and maintain the web server, compile, and run a simple web application	3	Emp
CO3	Students should be able to List the major elements of the PHP & MySQL work and explain why PHP is good for web development	3	Emp

Course Name	R Programming
Course Code	CA4401

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to understand the basics of R programming.	2	S
CO2	Students should be able to gain the knowledge of Data structure in R Programming.	2	S
CO3	Students should be able to understand the functions and loops in the R programming.	2	Emp
CO4	Students should be able to understand about the working with data in R programming	2	Emp
CO5	Students should be able to Gain the knowledge about the string and dates in R programming.	2	Emp

Course Name	Virtual Reality System
Course Code	CA4402

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to understand the concept of Virtual Reality environment	2	s
CO2	student should be able to understand the use of Hardware technologies for 3rd user interfaces.	2	s
CO3	Student should be able to explain various software technologies used in virtual reality	3	Emp

		3	Emp
CO4	Student should be able to explain various 3D interaction techniques used in virtual reality	3	Emp
CO5	Student should be able to understand Advances in 3D user interfaces in virtual reality	3	Emp

Course Name **Database Administration**
Course Code **CA4105**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Describe the fundamental organization of a computer system	2	S
CO2	Students should be able to Explain addressing modes, instruction formats and program control statements	3	Emp
CO3	Students should be able to understand the architecture and functionality of central processing unit.	2	s
CO4	Students should be able to Simplify in a better way the Input- Output organization	3	Emp
CO5	student should be able to understand the various types of knowledge representation in data administration.	2	Emp

Course Name **Network Security and Cryptography**
Course Code **CA4106**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	learn about the Cryptography & Network security, along with different IT/cyber laws to combat cyber crime	2	s
CO2	understand and analyze how different cryptographic algorithms and hashing techniques secure data and ensure CIA triad of network security	2	S
CO3	understand about various forms of malicious virus threats over internet.	2	Emp

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO4	learn about firewalls and other intrusion detection techniques.	2	Emp
CO5	learn about Basics, setting of VPN configuration and concepts of exchanging keys, modifying security policy.	2	Emp

Course Name **Introduction to Block Chain Technology**
Course Code **CA4204**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to understand the concept of Distributed Database, File System, Digital Signature	3	S
CO2	Students should be able to understand the concept of Blockchain Network, Mining Mechanism, Distributed Consensus, Chain Policy	3	Emp
CO3	Students should be able to understand the concept of Nakamoto consensus,, Sybil Attack	3	S
CO4	Students should be able to understand the concept of Distributed Ledger, Bitcoin protocols	3	Emp
CO5	Students should be able to understand the concept of Stakeholders, Domain Name Service and future of Blockchain.	3	Emp

Course Name **Cyber Law and Crimes**
Course Code **CA4205**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	understand about Computer security	2	s
CO2	understand about Cyber Law	2	s
CO3	understand about Cyber Crime	2	Emp
CO4	understand about Investigating Cybercrime	2	Emp
CO5	understand about Organizational and Human Security	2	Emp

Course Name **Digital Image Processing**
Course Code **CA4206**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Review the fundamental concepts of a digital image processing system.	2	s
CO2	Analyze images in the frequency domain using various transforms.	3	Emp
CO3	Evaluate the techniques for image enhancement and image restoration.	3	Emp
CO4	Categorize various compression techniques.	3	Emp
CO5	Interpret image segmentation and representation techniques.	3	Emp

Course Name   **Android Applications Development**
Course Code   **CA4207**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	understand the basics of Android platform and get to understand the activity and lifecycle.	2	S
CO2	design and create Layouts, Views like-Button, Toggle- Button, Radio-Button, Checkbox etc	2	Emp
CO3	understand file handling, managing data using SQLite, Data sharing with query string, projections.	2	Emp
CO4	understand messaging, networking and services.	2	Emp
CO5	understand location based services like Display map, zoom control, view and change, Marking, Geocoding etc.	2	Emp

Course Name   **Deep Learning Concepts**
Course Code   **CA4307**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None
CO1	Students should be able to Define what is Neural Network and model a Neuron and Express both Artificial Intelligence and Neural Network	2	Emp
CO2	Students should be able to Analyze ANN learning, Error correction learning, Memory-based learning, Hebbian learning, Competitive learning and Boltzmann learning	3	Emp
CO3	Students should be able to Implement Simple perception, Perception learning algorithm, Modified Perception learning algorithm, and Adaptive linear combiner, Continuous perception, learning in continuous perception	3	Emp
CO4	Students should be able to Analyze the limitation of Single layer Perceptron and Develop MLP with 2 hidden layers, Develop Delta learning rule of the output layer and Multilayer feed forward neural network with continuous perceptions,	3	Emp
CO5	Students should be able to Design of another class of layered networks using deep learning principles.	3	Emp

Course Name **E-Commerce and M-Commerce**
Course Code **CA4309**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	understand about Electronic Commerce	2	s
CO2	understand about Electronic Commerce strategies	2	S
CO3	understand about Reference Models	2	Emp
CO4	understand about Electronic Market	2	Emp
CO5	understand about Electronic Business	2	Emp

Course Name **Software Process & Management**
Course Code **CA4312**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to Appreciate the engineering nature of software development. Describe key activities in software development and the role of modeling.	2	Emp
CO2	Students should be able to Learn how to capture software requirements and handle difficult situations in the course addresses elicitation, specification, and management of software system requirements	2	Emp
CO3	Students should be able to Explain key concepts in software development such as risk and quality; explain the basics of an object-oriented approach to software development. Describe a simple workflow for interacting with the published literature on software development.	2	S
CO4	Students should be able to Apply modern software testing processes in relation to software development and project management,Create test strategies and plans, design test cases, prioritize and execute them.	2	Emp
CO5	Students should be able to Study a body of knowledge relating to Software Engineering, Software reengineering, and maintenance; Understand the principles of large scale software systems, and the processes that are used to build them;	1	Emp

Course Name **Neural Networks**
Course Code **CA4311**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Student will be able to remember and understand biological structure of neural networks.	2	S
CO2	Student will be able to understand learning algorithms for pattern classification.	3	Emp
CO3	Student will be able to apply pattern Association preliminaries.	2	Emp
CO4	Student will be able to analyze Adaptive resonance theory and neocognitron.	3	Emp

CO5	Student will be able to understand storage security network.	3	Emp

Course Name **Cloud Computing**
Course Code **CA4310**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students should be able to understand the use of Cloud Computing Concepts.	2	S
CO2	Students should be able to solve real world application development problems using Google app engine, GKE.	3	Emp
CO3	Students should be able to understand the need of Google cloud storage options.	2	S
CO4	Students should be able to understand the use of networking and management tools.	2	S
CO5	Students should be able to manage machine learning applications over the cloud.	3	Emp

Course Name **Modeling and Simulation**
Course Code **CA4313**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than One)
CO1	Students will understand the techniques of modeling in the context of hierarchy of knowledge about a system and	3	S
CO2	Students should be able develop the capability to apply the same to study systems through available software.	3	Emp
CO3	Students will learn different types of simulation techniques	2	S
CO4	Students should be able to understand the use of networking and management tools.	3	S
CO5	Students will learn to simulate the models for the purpose of optimum control by using software.	3	Emp

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