Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Semester-II

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Data Science**	
Course Code: PGCS(AI&DS)201	**Semester: II**
Duration:48Hours	**MaximumMarks:100**
Teaching Scheme	**Examination Scheme**
Theory:3	**EndSemesterExam:70**
Tutorial:0	**Attendance:5**
Practical:0	**ContinuousAssessment:25**
Credit:3	**Practical /Sessional internal continuous evaluation: NA**
	Practical/ Sessional external examination: NA

Aim:

Sl. No.	
1.	To gain basic knowledge of data and information
2.	To gain basic knowledge of data science
3.	To understand the history, potential application area and future of data science
4.	To gain basic knowledge of machine learning

Objective:

Sl. No.	
1.	Provide you with the knowledge and expertise to become a proficient data scientist
2.	Demonstrate an understanding of statistics and machine learning concepts that are vital for data science
3.	Produce Python code to statistically analyze dataset
4.	Critically evaluate data visualizations based on their design and use for communicating stories from data

Pre-Requisite:

Sl. No.	
1.	Knowledge of basic mathematics
2.	Analytical and Logical skills

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Introduction to core concepts and technologies:** Introduction, Terminology, data science process, data science toolkit, Types of data, Example applications	6	5
02	**Data collection and management:** Introduction, Sources of data, Data collection and APIs, Exploring and fixing data, Data storage and management, Using multiple data Sources	7	10
03	**Data analysis:** Introduction, Terminology and concepts, Introduction to statistics, Central tendencies and distributions, Variance, Distribution properties and arithmetic, Samples/CLT, Basic machine learning algorithms, Linear regression, SVM, Naive Bayes	10	15
04	**Data visualization:** Introduction, Types of data visualization, Data for visualization: Data types, Data encodings, Retinal variables, Mapping variables to encodings, Visual encodings	11	20
05	**Applications of Data Science:** Technologies for visualization, Bokeh (Python)	7	10

06	**Recent trends:** Various data collection and analysis techniques, various visualization techniques, application development methods of used in data science.	7	10
	Sub Total:	**48**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**52**	**100**

List of Books
Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Cathy O'Neil and Rachel Schutt	Doing Data Science, Straight Talk From The Frontline	ISBN:9789351103189	O'Reilly
Jure Leskovek, Anand Rajaraman and Jeffrey Ullman	Mining of Massive Datasets	ISBN : 1316638499	Cambridge University Press
Kevin P. Murphy	Machine Learning: A Probabilistic Perspective	ISBN:0262018020	The MIT Press
Foster Provost and Tom Fawcett	Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking	ISBN1449361323	O'Reilly
Trevor Hastie, Robert Tibshirani and Jerome Friedman	Elements of Statistical Learning	Second Edition.ISBN0387 952845	Springer

End Semester Examination Scheme. **Maximum Marks-70.** **Time allotted-3hrs.**

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**ALL**	10	10				
B	**ALL**			5	3	5	
C	**ALL**			5	3	15	70

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to beset**	**Question to be answered**
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Artificial Intelligence and Artificial Intelligence Lab**	
Course Code: PGCS(AI & DS)202, PGCS(AI& DS)292	**Semester: II**
Duration: 36Hrs.	**Maximum Marks:100+100**
Teaching Scheme	**Examination Scheme**
Theory:3	**End Semester Exam:70**
Tutorial:0	**Teacher's Assessment:5**
Practical:4	**Internal Assessment:25**
Credit:3+2	**Practical/ Sessional internal continuous evaluation: 40**
	Practical/ Sessional external examination:60

Aim:

Sl. No.	
1.	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
2.	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
3.	Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4.	Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.

Objective:

Sl. No.	
1.	Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.
2.	Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.

Pre-Requisite:

Sl. No.	
1.	Basic concepts of linear algebra.
2.	Data Structures & Algorithms

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Introduction, Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe problem.	4	8

02	Intelligent Agents, Agents & environment, nature of environment, structure of agents, goal-based agents, utility-based agents, learning agents.	4	6
03	Problem Solving, Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, issues in the design of search programs.	4	10
04	Search techniques, solving problems by searching: problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies.	6	12
05	Heuristic search strategies, Greedy best-first search, A* search, Memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search, genetic algorithms; constraint satisfaction problems, local search for constraint satisfaction problems.	6	14
06	Adversarial search, Games, optimal decisions & strategies in games, the min-max search procedure, alpha beta pruning, additional refinements, iterative deepening	4	6
07	Dempster-Shafer theory, Fuzzy sets & fuzzy logics. Planning, components of a planning system, Goal stack planning, Hierarchical planning, other planning techniques.	4	5
08	Natural Language processing, Introduction, Syntactic processing, semantic analysis, discourse & pragmatic processing	2	4
09	Forms of learning, inductive learning, learning decision trees, explanation based learning, learning using relevance information, neural net learning & genetic learning	2	5
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

Practical:
Skills to be developed:

1. Ability to implement solves any AI led problems using neural networks
2. Ability to learn hyper parameters tuning strategies
3. Ability to perform a comparative study of different neural networks for a given problem

List of Books:

Name of Author	**Title of the Book**	Edition/ISSN/ISBN	**Name of the Publisher**
Munesh Trivedi	A classical approach to Artificial Intelligence	ISBN:9788190698894	Khanna Book Publishing
Ritch & Knight	Artificial Intelligence	Third Edition	Tata McGraw Hill
Stuart Russel Peter Norvig	Artificial Intelligence A Modern Approach	Third Edition	Pearson
Patterson	Introduction to Artificial Intelligence & Expert Systems	ISBN: 0134771001	PHI
Russel	Artificial Intelligence	ISBN: 9780136042594	Pearson

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

List of equipment/apparatus for laboratory experiments:	
Sl. No.	
1.	Computer

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	70
C	ALL			5	3	15	

- □ Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- □ Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of Each question**	**Question to beset**	**Question to be Answered**
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Examination Scheme for Practical/ Sessional examination:

Practical/ Sessional Internal Continuous Evaluation

Internal Examination:

Continuous evaluation	**40**

External Examination: Examiner-

Signed Lab Assignments	**10**	
On Spot Experiment	**40**	
Viva voce	**10**	**60**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Web Analytics and Development and Web Analytics and Development Lab**	
Course Code: PGCS(AI&DS)203A	**Semester: II**
Duration: 48Hours	**MaximumMarks:100+100**
Teaching Scheme	**Examination Scheme**
Theory: 3	**EndSemesterExam:70**
Tutorial: 0	**Attendance:5**
Practical: 4	**ContinuousAssessment:25**
Credit: 3 + 2	**Practical/ Sessional internal continuous evaluation: 40**
	Practical/ Sessional external examination: 60

Aim:	
Sl. No.	
1.	To provide overview and establish the need for web analytics
2.	To understand and apply metrics to analyze the web data
3.	To provide exposure to usage of web analytic tools

Objective:	
Sl. No.	
1.	The course explores use of social network analysis to understand growing connectivity and complexity in the world ranging from small groups to WWW
2.	To become familiar with core research communities, publications, focused on web and social media analytics and research questions engaged in

Pre-Requisite:	
Sl. No.	
1.	Basic concepts on computer network

Contents		**3Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Introduction** – Social network and Web data and methods, Graph and Matrices, Basic measures for individuals and networks, Information Visualization	10	15
02	**Web Analytics tools:** Click Stream Analysis, A/B testing, Online Surveys	8	15
03	**Web Search and Retrieval:** Search Engine Optimization, Web Crawling and indexing, Ranking Algorithms, Web traffic models	9	15
04	**Making Connection**: Link Analysis, Random Graphs and Network evolution, Social Connects: Affiliation and identity	12	15
05	**Connection:** Connection Search, Collapse, Robustness Social involvements and diffusion of innovation	9	10
	Sub Total:	**48**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**52**	**100**

Practical:

Based on Theory Lecture.

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

List of Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Hansen, Derek, Ben Sheiderman, Marc Smith	Analyzing Social Media Networks with Node XL: Insights from a Connected World	ISBN: 9780123822307	Morgan Kaufmann
Avinash Kaushik	WebAnalytics2.0:The ArtofOnline Accountability	ISBN: 0470529393	Sybex

List of equipment/apparatus for laboratory experiments:

Sl. No.	
1.	Computer

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of Question to be set	Total Marks	No of Question to be set	To answer	Marks per question	Total Marks
A	**ALL**	10	10				
B	**ALL**			5	3	5	70
C	**ALL**			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to beset	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Examination Scheme for Practical/ Sessional examination:

Practical/ Sessional Internal Continuous Evaluation		
Internal Examination:		
Continuous evaluation		**40**
External Examination: Examiner-		
Signed Lab Assignments	**10**	
On Spot Experiment	**40**	
Viva voce	**10**	**60**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Big Data Analytics and Big Data Analytics Lab**	
Course Code: PGCS (AI &DS) 203B, PGCS (AI&DS) 293B	**Semester: II**
Duration: 36 Hrs.	**Maximum Marks:100+100**
Teaching Scheme	**Examination Scheme**
Theory: 3	**End Semester Exam: 70**
Tutorial: 0	**Attendance: 5**
Practical: 4	**Continuous Assessment: 25**
Credit: 3+2	**Practical/ Sessional internal continuous evaluation: 40**
	Practical/ Sessional external examination: 60

Aim:

Sl. No.	
1.	Ability to Understand big data for business intelligence.
2.	Learn business case studies for big data analytics.
3.	Understand NoSQL big data management.
4.	Perform map-reduce analytics using Hadoop and related tool.

Objective:

Sl. No.	
1.	To gather knowledge to make better decision by allowing scientist and other data user to analyze large volume of data

Pre-Requisite:

Sl. No.	
1.	**Data Structure**
2.	**Computer Organization and Architecture**

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Introduction, motivation, convergence of key trends, unstructured data, industry examples of big data, web analytics, big data and marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, big data and healthcare, big data in medicine, advertising and big data, big data technologies, introduction to Hadoop, open source technologies, cloud and big data, mobile business intelligence, Crowd sourcing analytics, inter and trans firewall analytics	6	14

02	Introduction to NoSQL, aggregate data models, aggregates, key-value and document data models, relationships, graph databases, schema less databases, materialized views, distribution models, sharding, master-slave replication, peer peer replication, sharding and replication, consistency, relaxing consistency, version stamps, map-reduce, partitioning and combining, composing map-reduce Calculations	6	14
03	Data format, analyzing data with Hadoop, scaling out, Hadoop streaming, Hadoop pipes, design of Hadoop distributed file system(HDFS), HDFS concepts, Java interface, data flow, Hadoop I/O, data integrity, compression, serialization, Avro, file-based data structure, Resonance architectures, Advances in Neural networks	6	14
04	Map Reduce workflows, unit tests with MR Unit, test data and local tests, anatomy of Map Reduce job run, classic Map-reduce, YARN, failures in classic Map-reduce and YARN, job scheduling, shuffle and sort, task execution, Map Reduce types, input formats, output Format	6	14
05	H base, data model and implementations, H base clients, H base examples, praxis. Cassandra, Cassandra data model, Cassandra examples, Cassandra clients, Hadoop integration	6	10
06	Pig, Grunt, pig data model, Pig Latin, developing and testing Pig Latin scripts. Hive, data types and file formats, HiveQL data definition, HiveQL data manipulation, HiveQL queries.	6	4
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

List of Practical:

1. Based on theory lectures.

List of Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Fedja Hadzic, Henry Tan, and Tharam S. Dillon	Mining of Data with Complex Structures	ISBN: 3642267033	Springer
Yates R. B. and Neto B.R.	Modern Information Retrieval	ISBN: 020139829	Pearson Education
Tan P. N., Steinbach M & Kumar V	Introduction to Data Mining	ISBN: 9780321321367	Pearson Education

List of equipment/apparatus for laboratory experiments:

Sl. No.	
1.	Computer

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

End Semester Examination Scheme		**Maximum Marks-70.**		**Time allotted-3hrs.**			
Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	
C	ALL			5	3	15	70

- Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of Each question**	**Question to be set**	**Question to be answered**
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Examination Scheme for Practical/ Sessional examination:

Practical/ Sessional Internal Continuous Evaluation

Internal Examination:

Continuous Evaluation	**40**

External Examination: Examiner-

Signed Lab Assignments	**10**	
On Spot Experiment	**40**	
Viva voce	**10**	**60**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Data Visualization and Data Visualization Lab**	
Course Code: PGCS(AI & DS) 203C, PGCS (AI & DS) 293C	
Duration: 36Hrs.	**Semester: II**
Teaching Scheme	**Maximum Marks: 100+100**
Theory:3	**Examination Scheme**
Tutorial: 0	**End Semester Exam:** 70
Practical: 4	**Attendance: 5**
Credit: 3+2	**ContinuousAssessment:25**
	Practical/ Sessional internal continuous evaluation: 40
	Practical/ Sessional external examination: 60

Aim:	
Sl. No.	
1	Ability to create visualizations from data
2	Ability to gain a better understanding of data from visualizations
3	Skill to make sense of trends in data from visualizations

Objective:	
Sl. No.	
1	To understand the need and benefits of data visualization
2	To create systematically univariate and bivariate graphs from data
3	To analyze and draw conclusions from visualizations

Pre-Requisite:	
Sl. No.	
1	Python Programming

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Introduction** About data visualization, The need for data visualization, Brief history of data visualization	2	2
02	**Statistical Preliminaries** Different types of data, Measures of Centrality, Measures of Dispersion, Measures of Association	4	7
03	**Univariate Visualizations** Stem-and-Leaf Plot, Pie Chart, Bar Graph, Histogram, Line Chart, Box Plot, Analysis and drawing conclusions	4	12
04	**Bivariate Visualizations** Scatter Plot, Bivariate Line Chart, Hex Plot, Analysis and drawing conclusions	4	8
04	**Python NumPy Library** NumPy and its advantages, NumPyn- dimensional array (nd array), Creating nd arrays in NumPy, Slicing nd arrays, nd array operations, Broadcasting	8	16
05	**Data Visualizations in Python** Plotting with matplotlib, Univariate graphs using matplot lib, Bivariategraphsusingmatplotlib,plottingthroughpandas,Improvingplotaesthetics	8	16
06	**Recent Trends:** High-dimensional data, Visualizing large graphs and networks, Topological abstraction and summarization for data visualization, Personalized visualization: humanistic approach to data	6	9
	Sub Total:	**36**	**70**

	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

Practical:

Skills to be developed:

1.Data interpretation skills using statistics
2.Data analysis skills from visualizations
3.Mathematical computation skills in Python
4.Visualizationcreationskills

List of Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Sheldon M Ross	Introduction to Probability and Statistics for Engineers and Scientists	ISBN: 0123948118	Elsevier
B. Lubanovic	Introducing Python	ISBN: 9781492051367	O'Reilly
Murray R. Spiegel, Larry J. Stephens	Schaum's Outlines on Statistics	ISBN: 9780070602816	McGraw-Hill
Eric Matthes	Python Crash Course	ISBN : 1593279280	No Starch Press
Ivan Idris	Numpy Beginner's Guide	ISBN : 1785281968	Packt Publishing

List of equipment/apparatus for laboratory experiments:

Sl. No.	
1.	Computer

End Semester Examination Scheme. MaximumMarks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of Question to be set	Total Marks	No of Question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	
C	ALL			5	3	15	70

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Examination Scheme for Practical/ Sessional examination:

Practical/ Internal Sessional Continuous Evaluation

Internal Examination:

Continuous evaluation	**40**

External Examination: Examiner-

Signed Lab Assignments	**10**	
On Spot Experiment	**40**	
Viva voce	**10**	**60**

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Cloud Computing and Edge Computing**	
Course Code: PGCS(AI & DS)204A	**Semester: II**
Duration: 36 Hours	**Maximum Marks:100+100**
Teaching Scheme	**Examination Scheme**
Theory:03	**EndSemesterExam:70**
Tutorial:0	**Attendance:5**
Practical:0	**ContinuousAssessment:25**
Credit:3	**Practical/ Sessional internal continuous evaluation: NA**
	Practical/ Sessional external examination: NA

Aim:

Sl. No.	
1.	Identify security aspects of each cloud model
2.	Develop a risk-management strategy for moving to the Cloud
3.	Implement a public cloud instance using a public cloud service provider
4.	Apply trust-based security model to different layer

Objective:

Sl. No.	
1.	To apply trust-based security model to real-world security problems.
2.	An overview of the concepts, processes, and best practices needed to successfully secure information within Cloud infrastructures.
3.	The basic Cloud types and delivery models and develop an understanding of the risk and compliance responsibilities and Challenges for each Cloud type and service delivery model.

Pre-Requisite:

Sl. No.	
1.	**Networking**
2.	**Distributed Computing**

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Introduction to Cloud Computing:** Online Social Networks and Applications, Cloud introduction and overview, Different clouds, Risks, Novel applications of Cloud computing	**4**	**10**
02	**Cloud Computing Architecture:** Requirements, Introduction Cloud computing architecture, On Demand Computing Virtualization at the infrastructure level, Security in Cloud computing environments, CPU Virtualization, A discussion on Hypervisors Storage Virtualization Cloud Computing Defined, The SPI Framework for Cloud Computing, The Traditional Software Model, The Cloud Services Delivery Model, Cloud Deployment Models, Key Drivers to Adopting the Cloud, The Impact of Cloud Computing on Users, Governance in the Cloud, Barriers to Cloud Computing Adoption in the Enterprise	**11**	**14**
03	**Security Issues in Cloud Computing:** Infrastructure Security, Infrastructure Security: The Network Level, The Host Level, The Application Level, Data Security and Storage, Aspects of Data Security, Data Security Mitigation Provider Data and Its Security, Identity and Access Management Trust Boundaries and IAM, IAM Challenges, Relevant IAM Standards and Protocols for Cloud Services, IAM Practices in the Cloud, Cloud Authorization Management	**4**	**14**

04	**Security Management in the Cloud:** Security Management Standards, Security Management in the Cloud, Availability Management: SaaS, PaaS, IaaS Privacy Issues, Privacy Issues, Data Life Cycle, Key Privacy Concerns in the Cloud, Protecting Privacy, Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing, Legal and Regulatory Implications, U.S. Laws and Regulations, International Laws and Regulations	**8**	**14**
05	**Audit and Compliance:** Internal Policy Compliance, Governance, Risk, and Compliance (GRC), Regulatory/External Compliance, Cloud Security Alliance, Auditing the Cloud for Compliance, Security-as-a-Cloud	**5**	**14**
06	**ADVANCED TOPICS:** Recent developments in hybrid cloud and cloud security	**4**	**4**
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

List of Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
1. John Rhoton	Cloud Computing Explained: Implementation Handbook for Enterprises	ISBN: 0956355609	Recursive Limited
2. Tim Mather	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice)	ISBN:0596802765	O'Reilly Media

End Semester Examination Scheme. MaximumMarks-70. Time allotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question To be set	Total Marks	No of question To be set	To answer	Marks per question	Total Marks
A	ALL	10	10		3		70
B	ALL			5		15	
C	ALL			5	3	45	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to beset	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Expert Systems**	
Course Code: PGCS (AI & DS) 204B	
Duration: 36Hrs.	**Semester: II**
Teaching Scheme	**MaximumMarks:100+100**
Theory: 3	**Examination Scheme**
Tutorial: 0	**EndSemesterExam:70**
Practical: 0	**Attendance:5**
Credit: 3	**ContinuousAssessment:25**
	Practical/ Sessional internal continuous evaluation: NA
	Practical/ Sessional external examination: NA

Aim:	
Sl. No.	
1.	Ability to learn key techniques of the Expert Systems

Objective:	
Sl. No.	
1.	Familiarize students with the basic and advanced techniques of Expert Systems
2.	To learn key techniques of the Expert Systems

Pre-Requisite:	
Sl. No.	
1.	Discrete mathematics, Set theory; Complexity theory

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Unit1:** Overview of AI: What is AI? The importance of AI, Early works in AI, AI and Related fields. Knowledge: Importance of Knowledge, knowledge-based system representation, organization, manipulation, acquisition.	**4**	**10**
02	**Unit2**: Search Techniques: Problem Solving, State space search, Blind search: Depth first search, Breadth first search, informed search: Heuristic search, Hill climbing search, Best first search, A*, AO*, Constraint satisfaction. Game Playing: Mini max search, Alpha–beta pruning.	**4**	**10**
03	**Unit3:** Knowledge Representation: Predicate Logic (well formed formulas, quantifiers, Prenex Normal Form, Skolemization, Unification, Modus pones, Resolution refutation –various strategies), Rule Based Systems (Forward reasoning: Conflict resolution, Conflict resolution, backward reasoning: Use of No. Backtracking, Structured Knowledge Representations (Semantic Net: slots, inheritance, Frames: exceptions and defaults handling. Conceptual Dependency formalism, Object oriented representations.	**4**	**10**
04	**Unit4:** Handling uncertainty: Probabilistic reasoning: Bayes Net, Dempster Shafer Theory, Use of certainty Factors, Fuzzy Logic, Non monotonic reasoning, Dependency directed backtracking, Truth maintenance systems, Learning: Concept of learning, Learning automation, The Genetic algorithm, Learning by induction, Neural Networks: Hopfield Networks, Perceptrons-Learning algorithm, Back propagation Network, Boltzman Machine, Recurrent Networks.	**4**	**10**

05	**Unit5:** Planning: Components of Planning System, Plan Generation Algorithms: Forward state propagation, Backward state propagation, Nonlinear planning using constraint posting, Natural Language Processing: Syntactic analysis, Top down and bottom up parsing, Augmented Transition Networks, Semantic analysis, case grammars.	**5**	**10**
06	**Unit6:** Expert System: Need and Justification for expert systems- cognitive problems, Expert System Architectures (Rule based systems, Nonproduction system, knowledge acquisition, Case studies: MYCIN, R1.	**5**	**5**
07	**Unit7:** Ontology and Description Logics A Description Logic, Normalization, Structure Matching, Classification, A-box Reasoning, Extensions, ALC, Further Extensions. Inheritance Taxonomies and Inheritance, Beliefs, Credulous and Skeptical Reasoning	**4**	**5**
08	**Unit8:** Default Reasoning Introduction to Default Reasoning, Circumscription, Minimal Models, The Event Calculus Revisited, Default Logic, Auto epistemic Logic. Reasoning in Multi- agent Systems Epistemic Logic: Kripke Semantics in a Multi Agent Scenario, The Muddy Children Puzzle	**6**	**10**
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

List of Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Joseph C. Giarratano	Expert systems	ISBN: 0534384471	Course Technology Inc
D.A. Waterman	A Guide to Expert System	ISBN: 0201083132	Addison Wesley

End Semester Examination Scheme. MaximumMarks-70. Time allotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	70
C	ALL			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to beset	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Knowledge Discovery**	
Course Code: PGCS(AI&DS)204C	**Semester: II**
Duration:48Hours	**MaximumMarks:100**
Teaching Scheme	**Examination Scheme**
Theory:3	**EndSemesterExam:70**
Tutorial:0	**Attendance:5**
Practical:0	**ContinuousAssessment:25**
Credit:3	**Practical/ Sessional internal continuous evaluation: NA**
	Practical/ Sessional external examination: NA

Aim:	
Sl. No.	
1.	To introduce Knowledge Discovery techniques/methods and their application.
2.	To help the students to extract useful knowledge from large volumes of data by prediction and clustering methods.
3.	To understand the sequence in which the data mining projects should be performed.

Objective:	
Sl. No.	
1.	To preprocess the data and apply appropriate algorithms.
2.	To integrate knowledge discovery tools.
3.	To map data mining techniques with the applications that handle uncertainty,

Pre-Requisite:	
Sl. No.	
1.	**Basic Programming Skill**

Contents		**3Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Introduction KDD and Data Mining-Data Mining and Machine Learning, Machine Learning and Statistics, Generalization as Search, Data Mining and Ethics	7	10
02	Knowledge Representation - Decision Tables, Decision Trees, Classification Rules, Association Rules, Rules involving Relations, Trees for Numeric Predictions, Neural Networks, Clusters	10	15
03	Decision Trees - Divide and Conquer, Calculating Information, Entropy, Pruning, Estimating Error Rates, The C4.5 Algorithm Evaluation of Learned Results-Training and Testing, Predicting Performance, Cross-Validation	9	15
04	Classification Rules - Inferring Rudimentary Rules, Covering Algorithms for Rule Construction, Probability Measure for Rule Evaluation, Association Rules, Item Sets, Rule Efficiency	8	15
05	Numeric Predictions - Linear Models for ClassificationandNumericPredictions,NumericPredictionswithRegressionTrees,EvaluatingNumericPredictions	7	8
06	Artificial Neural Networks – Perceptrons, Multilayer Networks, The Back propagation Algorithm Clustering -Iterative Distance - based Clustering, Incremental Clustering, The EM Algorithm	7	7
	Sub Total:	**48**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**52**	**100**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Assignments: Based on Theory Lecture.
List of Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
David Skillicorn	Knowledge Discovery for Counterterrorism and Law Enforcement	1st Edition	Chapman & Hall
Krzysztof J. Cios, Witold Pedrycz, Roman W. Swiniarski, Lukasz Andrzej Kurgan	Data Mining: A Knowledge Discovery Approach	1st Edition	Springer

End Semester Examination Scheme **Maximum Marks-70** **Time allotted- 3hrs.**

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of Question to be set	Total Marks	No of Question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	
C	ALL			5	3	15	70

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Constitution of India**	
Course Code: PGCS(AI& DS)205A	**Semester: II**
Duration:24Hours	**MaximumMarks:100**
Teaching Scheme	**Examination Scheme**
Theory: 02	**End Semester Exam:70**
Tutorial: 0	**Attendance: 5**
Practical: 0	**ContinuousAssessment:25**
Credit:0	

Aim:	
Sl. No.	
1.	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
2.	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social form leading to revolution in India.
3.	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
4.	Discuss the passage of the Hindu Code Bill of 1956.
Objective:	
Sl. No.	
1.	Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective
2.	To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
3.	To address the role of socialism in India after the commencement of the Bolshevik Revolution in1917and initial drafting of the Indian Constitution.
Pre-Requisite:	
	Nil

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**History of Making of the Indian Constitution:** History Drafting Committee,(Composition &Working)	4	14
02	**Philosophy of the Indian Constitution:** Preamble Salient Features	4	14
03	**Contours of Constitutional Rights & Duties:** • Fundamental Rights • Right to Equality • Right to Freedom • Right against Exploitation • Right to Freedom of Religion • Cultural and Educational Rights • Right to Constitutional Remedies • Directive Principles of State Policy • Fundamental Duties.	4	14

04	**Organs of Governance:** • Parliament • Composition • Qualifications and Disqualifications • Powers and Functions Executive • President • Governor • Council of Ministers • Judiciary, Appointment and Transfer of Judges, Qualifications • Powers and Functions	4	14
05	**Local Administration:** • District's Administration head: Role and Importance, • Municipalities: Introduction, Mayor and role of Elected Representative CEO of Municipal Corporation. • Pachayatiraj: Introduction, PRI: ZilaPachayat. • Elected officials and their roles, CEO ZilaPachayat: Position and role • Block level: Organizational Hierarchy (Different departments), • Village level: Role of Elected and Appointed officials, • Importance of grass root democracy	4	4
06	**Election Commission:** • Election Commission: Role and Functioning. • Chief Election Commissioner and Election Commissioners. • State Election Commission: Role and Functioning. • Institute and Bodies for the welfare of SC/ST/OBC and women.	4	10
	Sub Total:	**24**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**28**	**100**

List of Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
1.	The Constitution of India,1950 (Bare Act)		Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar	framing of Indian Constitution	1st Edition	Government Publication.
3. M.P. Jain	Indian Constitution Law	7th Edition	Lexis Nexis, 2014.
4. D.D. Basu	Introduction to the Constitution of India		Lexis Nexis, 2015.

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

End Semester Examination Scheme. MaximumMarks-70. Timeallotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	
C	ALL			5	3	15	70

- □ Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- □ Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Pedagogy Studies**	
Course Code: PGCS(AI&DS)205B	**Semester: II**
Duration:24Hours	**MaximumMarks:100**
Teaching Scheme	**Examination Scheme**
Theory:02	**End Semester Exam:70**
Tutorial:0	**Attendance:5**
Practical:0	**ContinuousAssessment:25**
Credit:0	

Aim:	
Sl. No.	
1.	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2.	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
3.	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
Objective:	
Sl.No.	
1.	Review existing evidence on their view topic to inform programmed design and policy making undertaken by the DID, other agencies and researchers.
2.	Identify critical evidence gaps to guide the development.
Pre-Requisite:	
	Nil

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Introduction and Methodology:** • Aims and rationale, Policy background, Conceptual frame work and terminology • Theories of learning, Curriculum, Teacher education. • Conceptual frame work, Research questions. • Overview of methodology and Searching.	4	14
02	**Thematic overview: Pedagogical practices are being used by teachers informal and informal class rooms in developing countries.** • Curriculum, Teacher education.	4	14
03	**Evidence on the effectiveness of pedagogical practices** • Methodology for the in-depth stage: quality assessment of included studies. • How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? • Theory of change. • Strength and nature of the body of evidence for effective pedagogical practices. • Pedagogic theory and pedagogical approaches. • Teachers' attitudes and beliefs and Pedagogic strategies.	4	14

04	Professional development: alignment with class room practices and follow-up support • Peer support • Support from the head teacher and the community. • Curriculum and assessment • Barriers to learning: limited resources and large class sizes	4	14
05	Research gap sand future directions • Research design • Contexts	4	4
06	Pedagogy • Teacher education • Curriculum and assessment • Dissemination and research impact.	4	10
	Sub Total:	**24**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**28**	**100**

Assignments: Based on theory

List of Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
1. Ackers J,Hardman F	Class room interaction in Kenyan Primary schools	Vol. 31, No. 2, 2001, p. 245-261	Compare,31(2): 245 - 261.
2. Agrawal M	Curricular reform in schools: The importance of evaluation,	ISSN 0022–027	Journal of Curriculum Studies,36(3):361-379.
3. Akyeampong K	Teacher training in Ghana -does it count? Multi-site teacher education research project (MUSTER) Country report1.		London: DFID.
4. Akyeampong K, Lussier K, Pryor J, Westbrook J	Improving teaching and learning of basic maths and reading in Africa: Does teacher Preparation count?	ISSN: ISSN-0738-0593	International Journal Educational Development,33(3): 272–282.
5. Alexander R J	Culture and pedagogy: International comparisons in Primary education.	ISBN : 0631220518	Oxford and Boston: Blackwell.
6. Chavan M	Read India: Amass scale, rapid, 'learning to read' campaign.	ISBN: 9780750662758	

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

End Semester Examination Scheme.		**MaximumMarks-70.**			**Timeallotted-3hrs.**		
Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question To be set	Total Marks	No of question To be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	
C	ALL			5	3	15	70

- □ Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- □ Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to beset**	**Question to be answered**
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech. in Artificial Intelligence and Data Science **Subject: Stress Management by Yoga**	
Course Code: PGCS(AI&DS) 205C	**Semester: II**
Duration:24Hours	**Maximum Marks:100**
Teaching Scheme	**Examination Scheme**
Theory:02	**End Semester Exam:70**
Tutorial:0	**Attendance:5**
Practical:0	**ContinuousAssessment:25**
Credit:0	

Aim:	
Sl. No.	
1.	Develop healthy mind in a healthy body thus improving social health
2.	Improve efficiency

Objective:	
Sl. No.	
1.	To achieve overall health of body and mind
2.	To overcome stress

Pre-Requisite:	
	Nil

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Definitions of Eight parts of yog. (Ashtanga)**	8	20
02	**Yam and Niyam. Do`s and Don'ts sin life.** i) Ahinsa, satya, astheya, bramha charya and aparigraha ii) Shaucha, santosh, tapa, swadhyay, ishwar pranidhan	8	30
03	**Asanand Pranayam** i) Various yog poses and their benefits for mind & body ii) Regularization of breathing techniques and its effects-Types of pranayama	8	20
	Sub Total:	**24**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**28**	**100**

Assignments: Based on theory

List of Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
1. Janardan Swami Yogabhyasi Mandal, Nagpur	'Yogic Asanas for Group Tarining-Part-I"		
2.Swami Vivekananda, Advaita Ashrama	"Raja yoga or conquering the Internal Nature"		(Publication Department),Kolkata

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

End Semester Examination Scheme.		**MaximumMarks-70.**			**Timeallotted-3hrs.**		
Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of Question to be set	Total Marks	No of Question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	
C	ALL			5	3	15	70

- □ Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- □ Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to beset**	**Question to be answered**
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Name of the Course: M. Tech .in Artificial Intelligence and Data Science **Subject: Personality Development Through Life Enlightenment Skills**	
Course Code: PGCS(AI &DS) 205D	**Semester: II**
Duration:24Hours	**MaximumMarks:100**
Teaching Scheme	**Examination Scheme**
Theory:02	**End Semester Exam:70**
Tutorial:0	**Attendance:5**
Practical:0	**ContinuousAssessment:25**
Credit:0	

Aim:	
Sl. No.	
1.	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
2.	The person who has studied Geeta will lead the nation and mankind to peace and prosperity
3.	Study of Neetishatakam will help in developing versatile personality of students.

Objective:	
Sl. No.	
1.	To learn to achieve the highest goal happily
2.	To become a person with stable mind, pleasing personality and determination
3.	To awaken wisdom in students

Pre-Requisite:	
	Nil

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Neetisatakam-Holistic development to personality** • Verses-19,20,21,22(wisdom) • Verses-29,31,32(pride & heroism) • Verses-26,28,63,65(virtue) • Verses-52,53,59(dont's)	8	20
02	• Verses-71,73,75,78(do's) • Approach to day to day work and duties. • ShrimadBhagwadGeeta:Chapter2-Verses41,47,48, • Chapter 3-Verses 13, 21, 27, 35, Chapter 6-Verses 5,13,17,23, 35, Chapter18-Verses45, 46,48.	8	20
03	• Statements of basic knowledge. • ShrimadBhagwadGeeta:Chapter2-Verses56,62,68 • Chapter 12 -Verses13,14,15,16,17,18 • Personality of Role model. Shrimad Bhagwad Geeta: • Chapter2-Verses17,Chapter3-Verses36,37,42, • Chapter4-Verses18, 38,39 • Chapter18–Verses 37,38,63	8	30
	Sub Total:	**24**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**28**	**100**

Syllabus for M. Tech. in Artificial Intelligence & Data Science (AI & DS)

Assignments:

List of Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
1.Swami Swarupananda Advaita Ashram	"Srimad Bhagavad Gita"	ISSBN: 9788175052628	
2.P.Gopinath,	Bhartrihari's Three Satakam (Niti-sringar-vairagya)	ISBN: 81-87276-27-4	Rashtriya Sanskrit Sansthanam, New Delhi.

End Semester Examination Scheme. MaximumMarks-70. Timeallotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	ALL	10	10				
B	ALL			5	3	5	70
C	ALL			5	3	15	

- □ Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- □ Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to beset	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Name of the Course: M. Tech. in Artificial Intelligence and Data Science
Subject: Term Paper with Seminar

Course Code: PGCS(AI& DS) 281	**Semester:2nd**
Duration:24hrs	**MaximumMarks:100**
Teaching Scheme	**ExaminationScheme100**
Theory:4	**End Semester Exam:**
Tutorial:0	**Teacher'sAssessment:0**
Practical:0	**InternalAssessment:0**
Credit:2	**Practical/ Sessional internal continuous evaluation:40**
	Practical/ Sessional external examination:60

Contents

Students will do projects on application areas of latest technologies and current topics of societal relevance.