

YMCA University of Science and Technology, Faridabad
BCA Scheme of Studies / Examination
Semester – V

Course No.	Course Title	Schedule				Sessional Marks/ Internal	Marks for End Term Examination		Total Marks	Credits
		L	T	P	Total		Theory	Practical		
BCA-DS-301	Big Data - 1	3		-	3	25	75	-	100	3
BCA-DS-302	Machine Learning - 1	3		-	3	25	75	-	100	3
BCA-DS-303	Organizational Behavior	3		-	3	25	75	-	100	3
BCA-DS-304	Intellectual Property and Rights	3		-	3	25	75	-	100	3
As per list above	General Elective - III	3		-	3	25	75	-	100	3
BCA-DS-305	Big Data – I Lab	-		4	4	25	-	50	75	2
BCA-DS-306	Machine Learning – I Lab	-		4	4	25	-	50	75	2
BCA-DS-307	Presentation	-		2	2	25	-		25	1
BCA-DS-308	Group Discussion	-		2	2	25	-		25	1
BCA-DT-301	Industrial Training - II					50		50	100	3
	Total				27	275	375	150	800	24

Note: Exam duration will be as under

(a) Theory exams will be of 3 hours duration

(b) Practical exams will be of 3 hours duration

BCA-DS-301: BIG DATA -1
BCA V Semester

No. of Credits: 3			
L	T	P	Total
3	0	0	3

Sessional:	25 Marks
Theory :	75 Marks
Total :	100 Marks
Duration of Exam:	3 Hours

Note: Examiner will be required to set *Seven* questions in all having two parts. Part I will have Question Number 1 consisting of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 15 marks. In Part II, there will be *Six* questions. Examiner will set one and a half questions from each Unit of the syllabus and each question will carry 15 marks. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions from Part II.

COURSE OBJECTIVES:

1. To Understand and Target Customers
2. To Take Strategic Decision
3. Cost Optimization
4. To Improve Customer Experiences

SYLLABUS

UNIT-I

Big Data - Beyond the Hype: Introduction, Why Big Data, History of Big Data, Characteristics of Big Data - The Four V's, advantages and disadvantages, Big Data Management approach, Technology challenges for Big Data, Big Data Architecture, Applications of Big Data

UNIT - II

Data Structures in Java: Linked List, Stacks, Queues, Sets, Maps, Generics: Generic classes and Type parameters, Implementing Generic Types, Generic methods, Wrapper classes, Concept of serialization.

UNIT – III

Working with Big Data: Hadoop framework, Hadoop Distributed File System (HDFS), Comparison between HDFS and Google File system, Building Blocks of Hadoop (Namenode, Datanode, Secondary Namenode, Job Tracker, Task Tracker), Introducing and configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully distributed node), YARN architecture.

UNIT – IV

MapReduce: Overview, MapReduce programming: Driver code, Mapper Code, Reducer code, Combiner, Partitioner, Sorting, Shuffling, MapReduce Jobs Execution, Hadoop Streaming, Introduction to Hive and Pig.

COURSE OUTCOMES:

After completion of this course, students will be able to

1. Optimize business decisions and create competitive advantage with Big Data analytics

2. Understand Java concepts required for developing map reduce programs
3. Derive business benefit from unstructured data
4. Learn the architectural concepts of Hadoop and introducing map reduce paradigm

TextBooks/Reference Books

1. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reily
2. Hadoop in Practice by Alex Holmes, MANNING Publ.
3. Seema Acharya (Author), SubhashiniChellappan, Big Data and Analytics (2015). Wiley Publication.
4. Big Data, Black Book: Covers Hadoop 2, MapReduce, Hive, YARN, Pig, R and Data Visualization (2016), DT Editorial Services

Note: Latest and additional good books may be suggested and added from time to time.



BCA-DS-302: MACHINE LEARNING-1
BCA V Semester

No. of Credits: 3
L T P Total
3 0 0 3

Sessional: 25 Marks
Theory : 75 Marks
Total : 100 Marks
Duration of Exam: 3 Hours

Note: Examiner will be required to set *Seven* questions in all having two parts. Part I will have Question Number 1 consisting of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 15 marks. In Part II, there will be *Six* questions. Examiner will set one and a half questions from each Unit of the syllabus and each question will carry 15 marks. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions from Part II.

COURSE OBJECTIVES:

The purpose of machine learning is to discover patterns in your data and then make predictions based on those often, complex patterns to answer business questions, and help solve problems.

SYLLABUS

UNIT I

INTRODUCTION TO MACHINE LEARNING: Machine Learning basic concepts, Perspectives and Issues in Machine Learning, Types of Machine Learning, supervised – unsupervised – reinforcement, Data Representations: Data representation, Numerical representation, Graph representation, Applications of Machine Learning.

UNIT II

SUPERVISED LEARNING: Nearest-Neighbours, Decision Trees, Naïve Bayes, Linear classification, univariate linear regression, multivariate linear regression, regularized regression, Logistic regression, Support Vector Machines, Nonlinearity and Kernel Methods.

UNIT III

UNSUPERVISED LEARNING: Clustering: K-means, Kernel K-means, Cluster analysis, Vector Quantization, Self-Organizing Feature Map, Association Rule Mining: Apriority algorithms

UNIT IV

TECHNIQUES AND APPLICATIONS: Scalable Machine Learning, Introduction to Bayesian Learning and Inference, Recent trends in various learning techniques of machine learning and classification methods.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Extract features that can be used for a particular machine learning approach in various IOT applications.
2. To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.

2. To mathematically analyze various machine learning approaches and paradigms.

Text Books/Reference Books

1. Kevin Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, "The Elements of Statistical Learning", Springer 2009 (freely available online)
3. Ethem Alpaydin, —Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series), Third Edition, MIT Press, 2014
4. Tom M Mitchell, —Machine Learning, First Edition, McGraw Hill Education.

Note: Latest and additional good books may be suggested and added from time to time.



BCA-DS-303 ORGANIZATIONAL BEHAVIOUR
B.C.A V SEMESTER

No. of Credits: 3				Sessional:	25 Marks
L	T	P	Total	Theory :	75 Marks
3	0	0	3		100
				Total :	Marks
				Duration of Exam:	3 Hours

Note: Examiner will be required to set *Seven* questions in all having two parts. Part I will have Question Number 1 consisting of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 15 marks. In Part II, there will be *Six* questions. Examiner will set one and a half questions from each Unit of the syllabus and each question will carry 15 marks. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions from Part II.

COURSE OBJECTIVES:

The objective of this course is to expose the students to basic concepts of management and provide insights necessary to understand behavioral processes at individual, team and organizational level.

UNIT-1

Introduction to management: concept, nature; evolution of management thoughts –traditional, behavioral, system, contingency and quality viewpoints; Managerial levels, skills and roles in an organization; Functions of Management: Planning, Organizing, Directing, Controlling, Problem solving and Decision making; Management control; managerial ethics and social responsibility; Management Information System (MIS).

UNIT-2

Fundamentals of Organizational Behavior: Concept, evolution, importance and relationship with other Fields; Contemporary challenges of OB; Individual Processes and Behavior – differences, Personality concept, determinant, theories and applications; Values, Attitudes and Emotions, Perception- concept, process and applications, Learning and Reinforcement; Motivation: concept, theories and applications; Stress management.

UNIT-3

Interpersonal Processes- Work teams and groups- Definition of Group, Stages of group development, Group cohesiveness, Types of groups, Group processes and Decision Making; Team Building; Conflict- concept, sources, types, management of conflict; Power and Political Behavior; Leadership: concept, function and styles.

UNIT-4

Organizational Processes and structure: organizational design: various organizational structures and their effect on human behavior; Organizational climate; Organizational culture;

Organizational change: Concept, Nature, Resistance to Change, Change Management, Implementing Change and Organizational Development.

COURSE OUTCOMES:

1. The students learn how to influence the human behavior.
2. Students will be able to understand behavioral dynamics in organizations.
3. Students will be able to apply managerial concepts in practical life.
4. Students will be able to understand organizational culture and change.

Text Books/Reference Books:

1. Robbins, S.P. and Decenzo, D.A. Fundamentals of Management, Pearson Education Asia, New Delhi.
2. Stoner, J et. al, Management, New Delhi, PHI, New Delhi
3. Satya Raju, Management – Text & Cases, PHI, New Delhi
4. Kavita Singh, Organisational Behaviour: Text and cases. New Delhi: Pearson Education.
5. Pareek, Udai, Understanding Organisational Behaviour, Oxford University Press, New Delhi
6. Robbins, S.P. & Judge, T.A., Organisational Behaviour, Prentice Hall of India, New Delhi

Note: Latest and additional good books may be suggested and added from time to time.



BCA-DS-304: INTELLECTUAL PROPERTY AND RIGHTS
B.C.A V SEMESTER

No. of Credits: 3
L T P Total
3 0 0 3

Sessional: 25 Marks
Theory : 75 Marks
100
Total : Marks
Duration of Exam: 3 Hours

Note: Examiner will be required to set *Seven* questions in all having two parts. Part I will have Question Number 1 consisting of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 15 marks. In Part II, there will be *Six* questions. Examiner will set one and a half questions from each Unit of the syllabus and each question will carry 15 marks. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions from Part II.

COURSE OBJECTIVES:

This course is designed for students to have knowledge of all rights resulting from intellectual activity in the industrial, scientific, literary, or artistic fields, industrial designs, scientific discoveries, protection against unfair competition, literary, artistic, and scientific works, Inventions in all fields of human endeavor, trademarks, service marks, commercial names, and designations.

SYLLABUS

UNIT - I

Introduction to Intellectual Property: Concept of Intellectual Property, Kinds of Intellectual Property, Economic Importance of Intellectual Property.

Indian Theory on Private Property: Constitutional Aspects of Property, Constitutional Protection of Property and Intellectual Property, Economic Development and Intellectual Property Rights Protection.

UNIT - II

Introduction to Patents: Overview, Historical Development, Concepts: Novelty, Utility.

Patentable Subject-matter: Patent Act, 1970- Amendments of 1999, 2000, 2002 and 2005, Pharmaceutical Products and Process and Patent, Protection, Software Patents, Business Method, Protection of Plant Varieties and Farmers' Rights Act, 2001, Patenting of Micro-organism.

UNIT – III

Procedure of Obtaining of Patents: Concepts of a Patent Application, Specification: Provisional, Complete, Disclosure Aspects, Claims: Principal, Dependant, Omnibus, Examination of Application, Opposition of Application, Sealing of Patents.

Working of Patents: Compulsory License: Commercialization of Inventions: License Terms of License Agreement, Assignments of Patents, Revocation of Patents.

UNIT – IV

Infringement: What is Infringement? How is Infringement determined? Who is an Infringer? Direct, Contributory and Induced, Defences of Infringement: 5.2.1 Research Exemption, Invalidity, Misuse, Failure to mark, Laches and Estoppel and first sale doctrine.

COURSE OUTCOMES:

After the completion of course, students will be able to

1. Understand the concept of intellectual property rights.
2. Develop procedural knowledge to Legal System and solving the problem of intellectual property rights.
3. Understand the professional program in Company Secretaryship, Law, Business (M.B.A.), International Affairs, Public Administration and other fields.
4. Understand the concept of establishment of Legal Consultancy and Service provider.

Text Books/ Reference Books:

1. W.R. Cornish, Intellectual Property, Sweet & Maxwell, London (2000)
2. P. Narayana, Patent Law, Wadhwa Publication
3. Merges, Patent Law and Policy: Cases and Materials, 1996
4. Brian C. Reid, A Practical Guide to Patent Law, 2nd Edition, 1993
5. Brinkhof (Edited), Patent Cases, Wolters Kluwer.
6. Prof. Willem Hoyng & Frank Eijssvogels, Global Patent Litigation, Strategy and Practice, Wolters Kluwer.
7. Gregory Stobbs, Software Patents Worldwide, Wolters Kluwer.
8. Feroz Ali Khader, The Law of Patents- With a special focus on Pharmaceuticals in India, Lexis Nexis Butterworths Wadhwa, Nagpur.
9. Sookman, Computer Law, 1996
10. N.S. Gopalakrishnan & T.G. Agitha, Principles of Intellectual Property (2009). Eastern Book Company, Lucknow.

Note: Latest and additional good books may be suggested and added from time to time.

BCA-DS-305: BIG DATA -I LAB
BCA V Semester

No. of Credits: 2
L T P Total
0 0 4 4

Sessional: 25 Marks
Practical: 50 Marks
Total : 75 Marks
Duration of Exam: 3 Hours

List of Programs:

1. Installation of Hadoop.
2. To perform HDFS Shell basic operations.
3. Write a program to cut, copy and paste the file or directory from HDFS to the local file system.
4. Write a program to get status of a file in the HDFS.
5. Write a program that using Hadoop APIs to do the “ls” operation for listing all files in HDFS.
6. Implementation of MapReducer as follows (Running the WordCount program): -

Modify the given example: WordCount

- Main function – add an argument to allow user to assign the number of Reducers.
- Mapper – Change WordCount to CharacterCount (except “”)
- Reducer – Output those characters that occur ≥ 20 times

After finishing part I, SORT the output of part I according to the number of times using the mapreduce programming model.

6. Java Programming examples on Stack, Queue and Linked List
7. Implementation of wrapper classes in java
8. Implementation of Java objects using the concept of serialization.

BCA-DS-306: MACHINE LEARNING- I LAB
BCA V Semester

No. of Credits: 2			
L	T	P	Total
0	0	4	4

Sessional:	25 Marks
Practical:	50 Marks
Total :	75 Marks
Duration of Exam:	3 Hours

List of Programs: -

1. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set.
2. Print both correct and wrong predictions.
3. Write a program to implement feature scaling & feature standardization of pre-processing & compare its result with KNN algorithm.
4. Write a program to demonstrate the working of the decision tree based ID3 algorithm.
5. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
6. Estimate the accuracy of decision classifier on cancer dataset using 5-fold cross-validation.
7. Write a program to implement Support vector machine algorithm on sample dataset.
8. Write a program to implement Simple Linear Regression on a sample dataset.
9. Write a program to implement Multi-Variate Linear Regression on a sample dataset.
10. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
11. Write a program to construct a Bayesian network considering medical data like heart patient or diabetes dataset.
12. Using a dataset with known class labels compare the labeling error of the K-means algorithm. Measure the error by assigning a class label to each example. Assume that the number of clusters is known. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set.
13. Print both correct and wrong predictions.
14. Write a program to implement feature scaling & feature standardization of pre-processing & compare its result with KNN algorithm.

15. Write a program to demonstrate the working of the decision tree based ID3 algorithm.
16. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
17. Estimate the accuracy of decision classifier on cancer dataset using 5-fold cross-validation.
18. Write a program to implement Support vector machine algorithm on sample dataset.
19. Write a program to implement Simple Linear Regression on a sample dataset.
20. Write a program to implement Multi-Variate Linear Regression on a sample dataset.
21. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
22. Write a program to construct a Bayesian network considering medical data like heart patient or diabetes dataset.
23. Using a dataset with known class labels compare the labeling error of the K-means algorithm. Measure the error by assigning a class label to each example. Assume that the number of clusters is known.