

Lovely Professional University, Punjab

Course Code	Course Title	Course Planner	Lectures	Tutorials	Practicals	Credits
INT234	PREDICTIVE ANALYTICS	17750::Ravinder Singh	0	0	4	2
Course Weightage	ATT: 5 CAP: 45 ETP: 50	Exam Category: X6: Mid Term Exam: Not Applicable – End Term Exam: Practical				
Course Orientation	RESEARCH, SKILL ENHANCEMENT					

Course Outcomes :Through this course students should be able to

CO1 :: review the art and science of predictive analytics to define clear actions that result in improved decisions and business results

CO2 :: evaluate the use of analytic tools and assist in the selection of industry standard analytics tools

CO3 :: construct and format data to be most effective to ensure the predictive model meets the business goals

CO4 :: deduce the characteristics of data sets and compare the trivial data and big data for various applications

	Reference Books (R)		
Sr No	Title	Author	Publisher Name
R-1	APPLIED PREDICTIVE ANALYTICS: PRINCIPLES AND TECHNIQUES FOR THE PROFESSIONAL DATA ANALYST	DEAN ABBOTT	WILEY, 4th Edition, (2012)
R-2	DATA ANALYTICS MADE ACCESSIBLE	ANIL MAHESHWARI	AMAZON.COM
R-3	R IN A NUTSHELL 2E	JOSEPH ADLER	O'REILLY
R-4	MACHINE LEARNING WITH R	BRETT LANTZ	PACKT PUBLISHING

Relevant Websites (RW)		
Sr No	(Web address) (only if relevant to the course)	Salient Features
RW-1	https://www.statistics.com/predictive-analytics-1/	Predictive analysis course algorithms
RW-2	https://www.datamentor.io/r-programming#learn-r-tutorial	R programming Syntax with Examples
RW-3	https://ieeexplore.ieee.org/document/6756866/	Predictive analytics and big data
RW-4	https://ieeexplore.ieee.org/document/7521522/	Use of predictive analytics technologies to understand fraud detection in canada
RW-5	https://www.cs.waikato.ac.nz/~ml/weka/gui_explorer.html	Information about weka tool
RW-6	https://www.edx.org/course/analyzing-visualizing-data-excel-microsoft-dat206x-7	online course on data visualization in excel

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RW-7	https://www.edx.org/course/predictive-analytics-iimbx-qm90	online course on predictive analytics
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Scheme for CA:

CA Category of this Course Code is:A0203 (2 best out of 3)

Component	Weightage (%)	Mapped CO(s)
BYOD-Practical 1	50	CO1, CO2
BYOD-Practical 2	50	CO2, CO3
BYOD-Practical 3	50	CO3, CO4

Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
BYOD-Practical 1	To test the querying approach and skill set of the student	Evaluation on contents covered from practical 1 to Practical 3	Individual	Online	100	3 / 4
BYOD-Practical 2	To test the querying approach and skill set of the student	Evaluation on contents covered from practical 7 to Practical 8	Individual	Online	100	7 / 8
BYOD-Practical 3	To test the querying approach and skill set of the student	Evaluation on contents covered from practical 11 to Practical 12	Individual	Online	100	11 / 12

Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	DATA PREPROCESSING	Exploring the structure of data	RW-2	Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring relationships between variables		Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring and understanding data		Student will learn to manage and explore the data along with different types of variables

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Practical 1	DATA PREPROCESSING	Managing data with R	RW-1	Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring numeric variables		Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring the structure of data	RW-2	Student will learn to manage and explore the data along with different types of variables
Practical 2	DATA PREPROCESSING	Exploring the structure of data	RW-2	Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring numeric variables		Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Managing data with R	RW-1	Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring and understanding data		Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring relationships between variables		Student will learn to manage and explore the data along with different types of variables
	DATA PREPROCESSING	Exploring the structure of data	RW-2	Student will learn to manage and explore the data along with different types of variables
Practical 3	SUPERVISED LEARNING: CLASSIFICATION	Probabilistic Learning: Using Naive Bayes		Students will learn implementation of naive bayes and decision trees
	SUPERVISED LEARNING: CLASSIFICATION	Probabilistic Learning: Using Naive Bayes		Students will learn implementation of naive bayes and decision trees
	SUPERVISED LEARNING: CLASSIFICATION	Divide and Conquer: Decision Trees and Rules		Students will learn implementation of naive bayes and decision trees
Practical 4	BYOD-Practical 1			
Practical 5	SURPERVISED LEARNING : NUMERIC PREDICTION	Polynomial Regression	RW-4	Students will learn forecasting of numeric data and implementing linear and polynomial regression
	SURPERVISED LEARNING : NUMERIC PREDICTION	Forecasting Numeric Data		Students will learn forecasting of numeric data and implementing linear and polynomial regression
	SURPERVISED LEARNING : NUMERIC PREDICTION	Simple Linear Regression		Students will learn forecasting of numeric data and implementing linear and polynomial regression
Practical 6	SURPERVISED LEARNING : NUMERIC PREDICTION	Ordinary least squares estimation		Students will implement correlations and multiple linear regression
	SURPERVISED LEARNING : NUMERIC PREDICTION	Correlations		Students will implement correlations and multiple linear regression
	SURPERVISED LEARNING : NUMERIC PREDICTION	Multiple Linear Regression		Students will implement correlations and multiple linear regression
Practical 7	SUPERVISED LEARNING:DUAL USE	Black Box Methods		Students will implement supervised learning dual use methods
	SUPERVISED LEARNING:DUAL USE	Neural Networks		Students will implement supervised learning dual use methods
	SUPERVISED LEARNING:DUAL USE	Support Vector Machines		Students will implement supervised learning dual use methods

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Practical 8	BYOD-Practical 2			
Practical 9	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	K-Means Clustering		Implementation of k-means clustering algorithm with real time datasets
	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	K-means clustering intuition	RW-5 RW-6	Implementation of k-means clustering algorithm with real time datasets
Practical 10	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	K-means selecting number of clusters		Implementation of k-means clustering algorithm with real time datasets
	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	K-means random initialization trap		Implementation of k-means clustering algorithm with real time datasets
	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	Dataset gathering		Implementation of k-means clustering algorithm with real time datasets
Practical 11	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	Hierarchical Clustering		Students will work on finding patterns and make market based analysis using association rules
	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	Finding Patterns		Students will work on finding patterns and make market based analysis using association rules
	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	Market Basket Analysis Using Association Rules		Students will work on finding patterns and make market based analysis using association rules
	UNSUPERVISED LEARNING: CLUSTERING AND PATTERN DETECTION	Association Rules		Students will work on finding patterns and make market based analysis using association rules
Practical 12	BYOD-Practical 3			
Practical 13	MODEL PERFORMANCE	Random forests		Students will learn about model performance and random forests
	MODEL PERFORMANCE	Boosting		Students will learn about model performance and random forests
	MODEL PERFORMANCE	Improving Model Performance		Students will learn about model performance and random forests
	MODEL PERFORMANCE	Evaluation Model Performance	RW-7	Students will learn about model performance and random forests
	MODEL PERFORMANCE	Bagging		Students will learn about model performance and random forests
Practical 14	MODEL PERFORMANCE	Bagging		Students will learn about model performance and random forests
	MODEL PERFORMANCE	Evaluation Model Performance	RW-7	Students will learn about model performance and random forests

Practical 14	MODEL PERFORMANCE	Improving Model Performance		Students will learn about model performance and random forests
	MODEL PERFORMANCE	Boosting		Students will learn about model performance and random forests
	MODEL PERFORMANCE	Random forests		Students will learn about model performance and random forests
	SPILL OVER			
Practical 15	Spill Over			