Programme	BSc Statistics
Course Code	STA3MN203 (P)
Course Title	Random variables and CART

Type of Course	Minor				
Semester	III				
Academic Level	200 - 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	Basic knowledge of set theory and probability theory				
Course Summary	This course offers a comprehensive understanding of random variables, distributions, and statistical learning methods like classification and regression trees, bagging, random forest, with hands-on experience in R				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Grasp random variables, distributions.	U	C	Instructor-created exams / Quiz
CO2	Summarize discrete, continuous distributions and analyze data to help entrepreneurial decisions using critical thinking skills.	Ap	P	Practical Assignment / Observation of Practical Skills
CO3	Calculate probabilities and statistical parameters for various standard distributions.	Ap	P	Seminar Presentation / Group Tutorial Work
CO4	Introduce to statistical learning, variables, models and critically evaluate ethical implications of statistical methods aligning with human values.	U	C	Instructor-created exams / Home Assignments
CO5	Understand bagging, random forest.	Ap	P	One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Implement classification, regression trees in R.	Ap	P	Viva Voce/ Instructor-created exams
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

Detailed Syllabus:

Module	Unit	Content	Hrs (45+ 30)	Marks (70)
I		**Random variables**	14	20
	1	Random variable	2	
	2	Distribution function	2	
	3	Discrete random variable	2	
	4	Probability mass function	2	
	5	Discrete distribution function	2	
	6	Continuous random variable	2	
	7	Probability density function	2	
	Unit 1: 5.1 Ref[2] Unit 2: 5.2 Ref[2] Unit 3: 5.3 Ref[2] Unit 4: 5.3.1 Ref[2] Unit 5: 5.3.2 Ref[2] Unit 6: 5.4 Ref[2] Unit 7: 5.4.1 Ref[2]			
II		**Standard distributions**	15	20
	8	Bernoulli distribution	2	
	9	Binomial distribution	4	
	10	Poisson distribution	4	
	11	Normal distribution	4	
	12	Importance of Normal distribution	1	
	Unit 8: 7.1 Ref[2] Unit 9: 7.2 Ref[2] Unit 10: 7.3 Ref[2] Unit 11: 8.2 Ref[2] Unit 12: 8.2.13 Ref[2]			
III		**Statistical learning**	10	20
	13	An introduction to Statistical learning	1	
	14	Input and output variables	1	
	15	Response and predictor variables	1	
	16	Supervised and unsupervised learning	1	
	17	Classification verses regression	1	
	18	Classification and regression trees (CART)	2	
	19	Trees versus linear models	2	
	20	Advantages and disadvantages of trees	1	
	Unit 13: 2.1 Ref[1] Unit 14: 2.1 Ref[1] Unit 15: 2.1 Ref[1] Unit 16: 2.1.4 Ref[1] Unit 17:2.1.5 Ref[1] Unit 18: 8.1.1,8.1.2 Ref[1] Unit 19: 8.1.3 Ref[1] Unit 20: 8.1.4 Ref[1]			
IV		**Bagging**	6	10
	21	An introduction to Bagging	3	

	22	Random forest	3	
	Unit 21: 8.2.1 Ref[1]			
	Unit 22: 8.2.2 Ref[1]			
V		**PRACTICUM**	**30**	
	Do practice problems in R software from any 5 units of the given list and one additional problem decided by the teacher-in-charge, related to the content of the course. Other units listed here may be used as demonstrations of the concepts taught in the course.			
	1	Fitting classification trees		
	2	Pruning trees		
	3	Use the function–lm.fit		
	4	Use the function–names()		
	5	Use the function–predict()		
	6	Plotting of least square regression line-abline()		
	7	Plotting of least square regression line- plot()		
	8	residuals() function		
	Sections from References:			
	Unit 1: 8.3.1 Ref[1]			
	Unit 2: 8.3.1 Ref[1]			
	Unit 3: 3.6.2 Ref[1]			
	Unit 4: 3.6.2 Ref[1]			
	Unit 5: 3.6.2 Ref[1]			
	Unit 6: 3.6.2 Ref[1]			
	Unit 7: 3.6.2 Ref[1]			
	Unit 8: 3.6.2 Ref[1]			

Books and References:

1. G. James, D. Witten, T. Hastie, and R. Tibshirani. (2013), An Introduction to Statistical Learning: with Applications in R, Springer.

2. Gupta, S.C. and Kapoor, V.K. (1997) Fundamentals of Mathematical Statistics. Sultan Chand and Sons, New Delhi

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	-	-	-	2	2	1	1	-	-	-
CO 2	2	2	-	3	2	2	2	1	2	-	3	-
CO 3	3	-	-	-	-	3	3	2	-	3	-	-
CO 4	2	-	-	-	-	2	2	3	1	-	-	3
CO 5	2	-	2	-	2	-	2	-	2	-	-	-
CO 6	-	-	-	2	-	2	1	2	-	3	-	-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓			✓
CO 4	✓	✓		✓
CO 5		✓		✓
CO 6	✓			

Programme	BSc Statistics
Course Code	STA3MN205 (P)
Course Title	Inferential statistics
Type of Course	Minor
Semester	III
Academic Level	200 - 299

Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75

Pre-requisites	Awareness of different types of data sets, basic understanding of probability theory
Course Summary	Discover statistical testing basics, including null and alternative hypotheses, critical regions, and test statistics like z, t, F, and Chi-square, with applications such as t-tests, ANOVA, and practical software exercises.

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Understand testing fundamentals and hypotheses.	U	C	Instructor-created exams / Quiz
CO2	Grasp test statistics and critical values.	U	C	Practical

					Assignment / Observation of Practical Skills/ Instructor-created exams
CO3	Apply t-tests and chi-square tests and analyze data to help entrepreneurial decisions using critical thinking skills.	Ap	F		Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Ability to calculate probabilities using normal distribution.	U	C		Instructor-created exams / Home Assignments
CO5	Comprehend Analysis of Variance and critically evaluate ethical implications of statistical methods aligning with human values.(ANOVA)	U	F		One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Conduct one sample tests in JASP software.	Ap	P		Viva Voce/ Instructor-created exams
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)					

Detailed Syllabus:

Module	Unit	Content	Hrs (48+30)	Marks 70
I		**Fundamentals of Testing**	**12**	**15**
	1	Tests of significance-Introduction	2	
	2	Null hypothesis	1	
	3	Alternative hypothesis	1	
	4	Errors in hypothesis testing	3	
	5	Critical region and Level of Significance	3	
	6	One and two tailed tests	2	

		Sections from References:		
		Unit 1: 12.4		
		Unit 2:12.5		
		Unit 3:12.5.1		
		Unit 4: 12.6		
		Unit 5:12.7		
		Unit 6: 12.7.1		
II		**Distribution Theory**	**10**	**15**
	7	Normal distribution-Properties	2	
	8	Properties of Normal distribution	1	
	9	Standard normal distribution	1	
	10	Problems with table values	2	
	11	Statistic of Chi-square distribution	2	
	12	Statistic of Student's t distribution	1	
	13	Statistic of F distribution	1	
		Sections from References:		
		Unit 7:8.2.2 Ref[2]		
		Unit 8: 8.2.2 Ref[2]		
		Unit 9: 8.2.14 Ref[2]		
		Unit 10: 8.2.14 Ref[2]		
		Unit 11: 13.1 Ref[2]		
		Unit 12: 14.2 Ref[2]		
		Unit 13: 14.5 Ref[2]		

III		Tests of Hypothesis	14	20
	14	Steps for testing of hypothesis	2	
	15	t test for single mean	3	
	16	t test for difference of means	3	
	17	Chi square tests for Goodness of fit	3	
	18	Chi square test for independence of two attributes	3	
	Sections from References: Unit 14:12.7.3 Ref[2] Unit 15: 14.2.9 Ref[2] Unit 16: 14.2.10 Ref[2] Unit 17: 13.7.2 Ref[2] Unit 18: 13.7.3 Ref[2]			
IV		Analysis of variance	9	20
	19	Introduction to Analysis of variance	1	
	20	Assumptions	2	
	21	Techniques of ANOVA	2	
	22	One way ANOVA	4	
	Sections from References: Unit 19: 5.5 Ref[1] Unit 20:5.6 Ref[1] Unit 21: 5.7 Ref[1] Unit 22:5.7 Ref[1]			

V		PRACTICUM	30	
		Do practice problems using JASP software from any 5 units of the given list and one additional problem decided by the teacher-in-charge, related to the content of the course. Other units listed here may be used as demonstrations of the concepts taught in the course.		
	1	Chi-square goodness of fit test		
	2	Chi-square test for independence		
	3	One sample t test		
	4	How ANOVA works in JASP		
	5	Running ANOVA in JASP		
	6	An illustrative data set		
	7	Assumptions of one way ANOVA		
	8	Continuity correction		
		Unit 1:9.1Ref[3] Unit 2: 9.2 Ref[3] Unit 3: 10.2 Ref[3] Unit 4:12.2 Ref[3] Unit 5:12.3 Ref[3] Unit 6:12.1 Ref[3] Unit 7: 12.6 Ref[3]		

	Unit 8: 9.3 Ref[3]		

Books and References:

1. S.P Gupta (2021), Statistical Methods 46 th Edition Gupta, S.C. and Kapoor, V.K. (1997)

2. Fundamentals of Mathematical Statistics. Sultan Chand and Sons, New Delhi

3. Navarro, D.J., Foxcroft, D.R., & Faulkenberry, T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners. (Version).

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	-	2	-	-	-	2	2	2	-	-	-	-
CO 2	3	3	-	-	-	3	3	1	-	-	-	-
CO 3	-	-	2	-	-	2	2	2	-	-	3	-
CO 4	2	3	2	-	-	3	3	2	-	3	-	-
CO 5	-	2	-	2	3	-	2	2	1	-	-	3
CO 6	3	-	3	-	-	-	2	1	-	3	-	-

Correlation Levels:

Level	Correlation

-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓	✓		✓
CO 2	✓			✓
CO 3	✓			✓
CO 4	✓	✓		✓
CO 5		✓		✓
CO 6	✓			

Programme	BSc Statistics				
Course Code	STA3MN209 (P)				
Course Title	Statistical inference				
Type of Course	Minor				
Semester	III				
Academic Level	200 - 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	Basic knowledge of random variable, probability, standard distributions				

Course Summary	Equip students with a comprehensive understanding of sampling theory and its applications in statistical inference.

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Define parameters and statistics, and differentiate between them using examples to illustrate their roles in statistical inference.	U	C	Instructor-created exams / Quiz
CO2	Explain what a sampling distribution is and differentiate it from a population distribution.	U	F	Practical Assignment / Observation of Practical Skills/ Instructor-created exams
CO3	Describe the procedures for statistical estimation, including point estimation and interval estimation, and analyze data to help entrepreneurial decisions using critical thinking skills.	U	C	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Identify unbiased and efficient estimators and apply them to estimate population parameters such as the mean, proportion, and variance.	U	C	Instructor-created exams / Home Assignments
CO5	Interpret interval estimators for population mean and population proportion and critically evaluate ethical implications of statistical methods aligning with human values.	Ap	P	One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Perform testing of hypothesis using any software.	Ap	P	Viva Voce/ Instructor-created exams
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

COURSE CONTENT

Mo	Units	Content	Hrs	Marks

dule				(45 +30)	(70)
		SAMPLING THEORY		**10**	**10**
1	**1**	Parameter and statistic		2	
	2	Sampling Distribution		2	
	3	Principles of sampling		2	
	4	Sampling distribution of a statistic		2	
	5	Central limit theorem		2	
	Sections from References: Unit 1: 15.4 [Ref 1] Unit 2: 15.4.1, 15.4.2 [Ref 1] Unit 3: 15.5 [Ref 1] Unit 4: 16.3 [Ref 1] Unit 5: 16.3.2 [Ref 1]				
		THEORY OF ESTIMATION		**11**	**25**
2	**6**	Statistical Estimation Procedures-Point Estimation and Interval estimation		2	
	7	Point estimation- Estimator and Estimate (Definition, Concept), Unbiases Estimator and Efficient Estimator, Point Estimators of Population Mean, Population Proportion, Population Variance		3	
	8	Interval estimation-Definition		3	
	9	Size of the random sample for specified precision		3	
	Sections from References: Unit 6: 16.2 [Ref 1] Unit 7: 16.2.1, 16.2.2, 1.62.3, 16.2.4, 16.2.5 [Ref 1] Unit 8: 16.4, 16.4.1, 16.4.2, 16.4.3 [Ref 1] Unit 9: 16.5 [Ref 1]				
		HYPOTHESIS TESTING		**12**	**20**
3	**10**	Testing of hypothesis, simple and composite hypothesis, null and alternate hypothesis		2	

	11	Types of errors, Size and power of tests, critical region	2	
	12	One tailed and two tailed tests	1	
	13	P- value or probability value of test statistic	1	
	14	Large sample tests	2	
	15	Test for single proportion	2	
	16	Test for single mean	2	

Sections from References:

Unit 10: 16.6, 16.6.1, 16.6.3, 16.6.4 [Ref 1]

Unit 11: 16.6.5, 16.6.6, 16.6.7 [Ref 1]

Unit 12: 16.6.8 [Ref 1]

Unit 13: 16.6.10 [Ref 1]

Unit 14: 17 [Ref 1]

Unit 15: 17.2.1 [Ref 1]

Unit 16: 17.3.1 [Ref 1]

		CHI SQUARE TEST	**12**	**15**
	17	Probability density function of Chi- square distribution	1	
	18	Applications of Chi square distribution	2	
	19	Chi square test of goodness of fit	3	
	20	Conditions for the validity for Chi square test	2	
	21	Chi square test for independence of attributes	3	
	22	Degrees of freedom	1	

4

Sections from References:

Unit 17: 18.2.1 [Ref 1]

Unit 18: 18.3 [Ref 1]

Unit 19: 18.4 [Ref 1]

Unit 20: 18.5 [Ref 1]

Unit 21: 18.6 [Ref 1]

	Unit 22: 18.7 [Ref 1]			
5	**PRACTICUM**		**30**	
	Do practice problems in spreadsheet from any 5 units of the given list and one additional problem decided by the teacher-in-charge, related to the content of the course. Other units listed here may be used as demonstrations of the concepts taught in the course.			
	1	Confidence interval for mean of single population		
	2	Confidence interval for difference of mean of double population		
	3	Confidence interval for proportion of single population		
	4	Confidence interval for difference of proportion of double population		
	5	Testing of hypothesis for mean of large population		
	6	Testing of hypothesis for mean of small population		
	7	Chi square test of goodness of fit		
	8	Chi square test for independence of attributes		

Books and References:
1. Gupta, S. C.. (2015). Fundamentals of Statistics, Himalaya Publishing House.
2. James E. Burt_ Gerald M. Barber_ David L. Rigby - Elementary Statistics for Geographers-The Guilford Press (2009)
3. J. Chapman McGrew Jr., Arthur J. Lembo Jr., Charles B. Monroe - An Introduction to Statistical Problem Solving in Geography, Third Edition-Waveland Press, Inc. (2014)
4. Mario F Triola, Elementary Statistics using Excel.

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2	-	-	-	-	1	-	-	-	-	-
CO 2	-	-	-	-	1	3	-	1	-	-	-	-
CO	-	-	-	-	-	-	-	-	-	-	2	-

3												
CO 4	1	-	–	-	-	3	-	-	-	-	-	3
CO 5	-	3	2	2	-	-	-	-	2	-	-	-
CO 6	-	-	3	-	-	3	-	-	-	2	3	-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓			✓
CO 2	✓	✓		✓
CO 3	✓			✓

CO 4		✓		✓
CO 5	✓	✓		✓
CO 6	✓			

Programme	BSc Statistics				
Course Code	STA3MN211 (P)				
Course Title	Probability theory and statistical distributions				
Type of Course	Minor				
Semester	III				
Academic Level	200 - 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	Familiarity with basic calculus such as differentiation and integration, basic knowledge of set theory. Experience with basic data visualization techniques.				
Course Summary	Provide students with a solid foundation in probability theory, including classical and axiomatic approaches, conditional probability, random variables, probability distributions and their applications.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Calculate probabilities of events using classical probability rules and understand their limitations.	U	C	Instructor-created exams / Quiz
CO2	Determine marginal probabilities and identify their role in joint probability distributions.	R	C	Practical Assignment / Observation of Practical Skills/ Instructor-created exams
CO3	Define random variables and distinguish between discrete and continuous random variables and analyze data to help entrepreneurial decisions using critical thinking skills.	R	F	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Understand the significance of probability distributions in statistical analysis and critically evaluate ethical implications of statistical methods aligning with human values.	U	C	Instructor-created exams / Home Assignments
CO5	Apply discrete and continuous probability distributions and understand their properties and applications.	Ap	F	One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Perform computations involving probabilities and using R programming language.	Ap	P	Viva Voce/ Instructor-created exams
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

Modul e	Uni t	Content	Hrs (45 +30)	Mark s (70)
I		**Probability**	**9**	**15**
	1	Basic concepts of Probability ,Classical definition of Probability ,Axiomatic approach to Probability	2	
	2	Addition Theorem, Multiplication Theorem	3	
	3	Conditional Probability	2	
	4	Independence of events	2	
		Sections from References: Unit 1: 3.3-3.8 [Ref 1] Unit 2: 3.9,3.11 [Ref 1] Unit 3: 3.10[Ref 1] Unit 4: 3.11-3.15 [Ref 1]		
II		**Random Variables**	**9**	**15**
	5	Random Variables, Discrete and continuous random variables	2	
	6	Probability distribution , Distribution function (Applications in discrete case)	3	
	7	Mathematical expectation (Applications in discrete case)	2	
	8	Variance (Applications in discrete case)	2	
		Sections from References: 4. Unit 5&6: 5.1-5.4.2 [Ref 1] 5. Unit 7: 6.1-6.4 [Ref 1] 6. Unit 8: 6.6 [Ref 1]		
III		**Discrete and Continuous distributions**	**19**	**25**
	9	Binomial distribution (Definition and problems)	2	
	10	Poisson distribution (Definition and problems)	2	
	11	Normal distribution (Definition and problems)	1	
	12	Properties of Normal distribution	3	
	13	Uniform distribution (Definition and properties)	3	
	14	Exponential distribution (Definition and properties)	3	
	15	Gamma distribution (Definition and properties)	1	
	16	Beta distribution (Definition and properties)	1	
	17	Cauchy, Pareto distribution (Definition only)	3	
		Sections from References: Unit 9:14.2 [Ref 2] Unit 10:14.3[Ref 2] Unit 11:14.4 [Ref 2] Unit 12:14.5 [Ref 2] Unit 13:14.6[Ref 2] Unit 14:14.7 [Ref 2] Unit 15:14.8 [Ref 2] Unit 16&17:14.9[Ref 2]		
IV		**R programming**	**8**	**15**
	18	R as a set of statistical tables	2	

	19	cumulative distribution	2	
	20	probability density function	2	
	21	plotting probability curves for standard discrete distributions.	1	
	22	plotting probability curves for standard continuous distributions	1	
	Sections from References: Unit 18: 3.3 [Ref 3] Unit 19: 3.3 [Ref 3] Unit 20: 3.3 [Ref 3] Unit 21:3.4&3.5 [Ref 3] Unit 22: 3.4 [Ref 3]			
V	**PRACTICUM**		**30**	
	Do practice problems in R software from any 5 units of the given list and one additional problem decided by the teacher-in-charge, related to the content of the course. Other units listed here may be used as demonstrations of the concepts taught in the course. 1. Graph of Binomial distribution 2. Graph of Poisson distribution 3. Graph of Normal distribution 4. Graph of Uniform distribution 5. Graph of Exponential distribution 6. Graph of Gamma distribution 7. Graph of Beta distribution 8. Graph of Cauchy distribution			
	Sections from References: Unit 1,2: 3.3 [Ref 3] Unit 3,4,5: 3.4 [Ref 3] Unit 6,7,8: 3.5 [Ref 3]			

Books and References:
1. Gupta, S. C. and Kapoor, V. K. (2020). Fundamentals of Mathematical Statistics, 12th edition, Sulthan Chand, New Delhi
2. Gupta, S. C.. (2015). Fundamentals of Statistics, Himalaya Publishing House
3. Sudha G Purohith, Sharad D Core, Shailaja R Deshmukh ,Statistics Using R(2015)

Mapping of COs with PSOs and POs:

	PSO 1	PSO 2	PSO 3	PSO 4	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2	-	-	-	-	1	-	-	-	-	-
CO 2	-	-	-	-	1	-	-	1	-	1	-	-
CO 3	-	-	-	2	-	-	-	-	-	-	3	
CO 4	-	-	-	-	-	1	-	-	-	-	-	2
CO 5	-	3	-	1	-	-	-	-	2	-	-	-
CO 6	-	-	1	-	2	3	-	-	-	-	3	-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

Mapping of COs to Assessment Rubrics:

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓			✓
CO 2	✓	✓		✓
CO 3	✓			✓
CO 4		✓		✓
CO 5	✓	✓		✓

CO 6	✓			