

COURSE PLAN & COURSE DATA SHEET

PROGRAM: BCA	DEGREE: BCA
COURSE: Computational Mathematics-II	SEMESTER: II CREDITS: 4
COURSE CODE: BS-118 REGULATION: Regular	COURSE TYPE: CORE /ELECTIVE / BREADTH/ S&H
COURSE AREA/DOMAIN: Intersection of Maths, Statistics, computer sciences	CONTACT HOURS: 3+1 (Tutorial) hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY):No	LAB COURSE NAME (IF ANY):No

PROGRAM EDUCATIONAL OBJECTIVES:

The objective of this course is to familiarize the students with arithmetic mean, harmonic mean, geometric mean, median and mode. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

SYLLABUS:

UNIT	DETAILS	HOURS
I	Measures of Central Tendency: Concept and properties of mathematical averages including arithmetic mean, geometric mean and harmonic mean, Mode and Median (and other partition values - quartiles, deciles, and percentiles) with graphic presentation.	10
II	Measures of Dispersion: Range, Quartile deviation, mean deviation, standard deviation, and their coefficients; Properties of standard deviation/variance, Moments: Calculation and significance.	9
III	Theory and approaches of probability: Theory and approaches of probability, Probability Theorems: Addition and Multiplication (Proof not required). Conditional probability and Bayes' Theorem (Proof not required), Binomial distribution: Probability distribution function, Poisson distribution: Probability function (including Poisson approximation to binomial distribution)	8
IV	Linear Programming Problem: Introduction to Linear Programming Problem, some definitions, mathematical formulation Linear Programming Problem, Graphical method of solving of Linear Programming Problem. Corner Point method.	8
V	Game Theory: Two-person-zero sum games, Games of pure strategies and games of mixed strategies, Rule of dominance, Graphic solutions to games, Applications in computer science.	10

TOTAL HOURS	

Teacher Centric Approach			
TC1: Chalk and Talk, Blended learning	TC2: PPT,	TC3: Video Lectures	TC4:
Learner Centric Approach:			
LC1: Assignment.	LC2: Mini project.	LC3: Quiz/Class test.	LC 4: Seminar on recent trends.
LC5: Group Task.	LC6: Others		

DETAILED SESSION PLAN

Lecture session/ Number	Topics to be covered	CO addressed	Teacher Centric Approach	Learner Centric Approach	References	Relevance with POs and PSOs
1.	Explain Measure of central tendency	CO1	TC1, TC2	LC2,LC3	T5/W2	PO2/PSO1
2.	Properties of mathematical average	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
3.	Arithmetic Mean with question	CO1	TC1, TC2	LC2,LC3	T1/W1	PO3/PSO1
4.	Explain Geometric Mean with questions	CO1	TC1, TC2	LC2,LC5	T4/W1	PO5/PSO1
5.	Explain Harmonic Mean with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
6.	Explain Mean with examples	CO1	TC1, TC2	LC2,LC5	T1/W1	PO2/PSO1
7.	Explain Mode with questions	CO1	TC1, TC2	LC2,LC3	T2/W1	PO2/PSO1
8.	Explain Median with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
9.	Explain Quartiles with questions	CO1	TC1, TC2	LC5,LC3	T1/W1	PO1/PSO1
10.	Explain deciles with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO3/PSO1
11.	Explain percentiles with questions	CO1	TC1, TC2	LC2,LC3	T5/W2	PO6/PSO1
12.	Graphics representation of Mea	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
13.	Explain measure of dispersion	CO1	TC1, TC2	LC2,LC3	T3/W2	PO5/PSO1
14.	Explain range with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1

15.	Explain quartile deviation with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
16.	Explain mean deviation with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
17.	Explain standard deviation with questions	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
18.	Properties of standard deviation	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
19.	Explain moments: calculation and significances	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
20.	Explain probability with theory and approach	CO1	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
21.	Probability theorem	CO3	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
22.	Addition and multiplication in probability	CO3	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
23.	Explain Bayes theorem	CO3	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
24.	Explain conditional probability with questions	CO3	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO1
25.	Explain Binomial distribution with questions	CO3	TC1, TC2	LC2,LC3	T1/W1	PO3/PSO2
26.	Explain Poisson distribution with questions	CO3	TC1, TC2	LC2,LC3	T1/W1	PO4/PSO1
27.	Explain Probability function with questions	CO3	TC1, TC2	LC2,LC3	T1/W1	PO5/PSO1
28.	Take test of unit -2	CO3	TC1, TC2	LC2,LC3	T1/W1	PO8/PSO1
29.	Explain LPP with formulation	CO2	TC1	LC2,LC3	T4/W1	PO2/PSO1
30.	Questions of LPP	CO2	TC1, TC2	LC2,LC3	T1/W1	PO3/PSO1
31.	LPP solution with examples	CO2	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO2
32.	Explain methods of LPP	CO2	TC1, TC2	LC2,LC3	T2/W1	PO2/PSO1
33.	Explain Graphical method	CO2	TC2	LC2,LC3	T1/W1	PO2/PSO1
34.	Graphical methods questions	CO2	TC1, TC2	LC2,LC3	T3/W1	PO2/PSO1
35.	Explain corner point method	CO2	TC1, TC2	LC2,LC3	T5/W1	PO7/PSO1
36.	Questions of Corner point method	CO2	TC1, TC2	LC2,LC3	T2/W1	PO5/PSO1
37.	Explain game theory	CO4	TC1, TC2	LC2,LC3	T1/W1	PO3/PSO1
38.	Introduce two person zero sum games	CO4	TC1, TC2	LC2,LC3	T1/W1	PO5/PSO1
39.	Explain games of pure strategies	CO4	TC1, TC2	LC2,LC3	T3/W2	PO4/PSO2
40.	Explain game of mixed strategies	CO4	TC1, TC2	LC2,LC3	T1/W1	PO2/PSO2

41.	Explain rule of dominance	CO4	TC2	LC5,LC3	T2/W1	PO6/PSO1
42.	Explain graphics solution to games	CO4	TC1, TC2	LC2,LC3	T5/W1	PO1/PSO1
43.	Some applications in computer science	CO4	TC1	LC2, LC5	T4/W1	PO2/PSO1
44.	Solved question of mixed strategies	CO4	TC1, TC2	LC2,LC3,LC5	T2/W2	PO4/PSO1
45.	Questions of pure strategies	CO4	TC1, TC2	LC2,LC3	T1/W1	PO3/PSO1

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
1	G.M. Clarke and D Cooke, A Basic Course in Statistics, Arnold, (2004)
2	W. Filler, An introduction to Probability theory and its applications, John Wiley, (1968)
3	A.M. Goon, M.K. Das and B. Dasgupta, Fundamentals of Statistics, World Press, (1997)
4	S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, S. Chand and sons, 2002.
5	. E.N. Barron, Game Theory: An Introduction, Wiley Student Addition, 2009

WEB SOURCE REFERENCES (W):

1	https://www.sciencedirect.com
2	https://onlinelibrary.wiley.com
3	
4	
5	
6	
7	

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
BS-117	Computational Mathematics-I	Operations of Matrix, Real Functions, Differentiation and integrations.	1 st

COURSE OBJECTIVES:

1	The objective of this course is to familiarize the students with arithmetic mean, harmonic mean, geometric mean, median and mode.
2	It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.
3	To understand the formulation of LPP
4	To understand the concept of Game theory.

COURSE OUTCOMES:

S.NO	DESCRIPTION	PO(1..12) MAPPING	PSO(1..3) MAPPING
CO.1	To understand the concept of central tendency	PO1	PSO1
CO.2	To solve linear programming problem	PO4	PSO2
CO.3	To understand and use the Theory and approaches of probability	PO6	PSO2
CO.4	To introduce the concept of game theory	PO7	PSO1
CO.5			
COURSE OVERALL PO/PSO MAPPING:			

COURSE OUTCOMES VS POs MAPPING (DETAILED; HIGH:3; MEDIUM:2; LOW:1):

S.NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Cxxx.1	2	2	2	2	1	1	3	1	-	-	-	-	1	2	3
Cxxx.2	3		2	2	1	2	2	1	-	-	-	-	2	1	1
Cxxx.3	1	1	1	2	1	2	1	1	-	-	-	--	1	3	2
Cxxx.4	1	1	1	2	2	1	1	1	-	-	-	-	1	1	2
Cxxx.5	1	3	1	2	3	1		1	-	-	-	-			
Cxxx*															

* For Entire Course, PO & PSO Mapping

POs & PSO REFERENCE:

PO1	Engineering Knowledge	PO7	Environment & Sustainability	PSO1
PO2	Problem Analysis	PO8	Ethics	PSO2
PO3	Design & Development	PO9	Individual & Team Work	PSO3
PO4	Investigations	PO10	Communication Skills		
PO5	Modern Tools	PO11	Project Mgt. & Finance		
PO6	Engineer & Society	PO12	Life Long Learning		

COs VS POs MAPPING JUSTIFICATION:

S.NO	PO/PSO MAPPED	LEVEL OF MAPPING	JUSTIFICATION
Cxxx.1	PO1/PSO1	2	Explain best concept of content
Cxxx.2	PO4/PSO1	1	
Cxxx.3	PO2/PSO2	1	
Cxxx.4	PO1/PSO1	3	
Cxxx.5	PO2/PSO2	3	
Cxxx*			

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS, POs & PSOs:

SNO	DESCRIPTION	PROPOSED ACTIONS
1		
2		

Lingaya's Vidyapeeth

Deemed-to-be-University u/s 3 of UGC Act 1956, Government of India

NAAC ACCREDITED

Approved by MHRD / AICTE / PCI / BCI / COA / NCTE

Nachauli, Jasana Road, Faridabad- 121002 (Haryana)

Website: www.lingayasvidyapeeth.edu.in | Ph: 0129-2598200-05

3		
4		
5		

PROPOSED ACTIONS: TOPICS BEYOND SYLLABUS/ASSIGNMENT/INDUSTRY VISIT/GUEST LECTURER/NPTEL ETC

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

1	
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DELIVERY/INSTRUCTIONAL METHODOLOGIES:

<input type="checkbox"/> CHALK & TALK	<input type="checkbox"/> STUD. ASSIGNMENT	<input type="checkbox"/> WEB RESOURCES	<input type="checkbox"/> NPTEL/OTHERS
<input type="checkbox"/> LCD/SMART BOARDS	<input type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> WEBNIARS

ASSESSMENT METHODOLOGIES-DIRECT

<input type="checkbox"/> ASSIGNMENTS	<input type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> TESTS/MODEL EXAMS	<input type="checkbox"/> UNIV. EXAMINATION
<input type="checkbox"/> STUD. LAB PRACTICES	<input type="checkbox"/> STUD. VIVA	<input type="checkbox"/> MINI/MAJOR PROJECTS	<input type="checkbox"/> CERTIFICATIONS
<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> OTHERS		

ASSESSMENT METHODOLOGIES-INDIRECT

<input type="checkbox"/> ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE)	<input type="checkbox"/> STUDENT FEEDBACK ON FACULTY (TWICE)
<input type="checkbox"/> ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS	<input type="checkbox"/> OTHERS

Prepared by
Priyavada

Approved by
Prof. Ritu Arun Sindhu

Additionally, the details to be compiled separately by the Departmental Coordinator for the entire Department.