

Vision

To pursue teaching-learning environment for providing best opportunity for the students to become skilled professionals and to strive the requirements of emerging IT skills.

Mission

“To strive for teaching students about computing with a focus on ethics, professional skills and technical knowledge to get them ready for jobs according to industry standards.”

PROGRAM EDUCATIONAL OBJECTIVE

PEO 1: To acquire in-depth knowledge and expertise in their specialized area, allowing them to make significant contributions in their profession.

PEO 2: The Program will adhere to high ethical standards and demonstrate professionalism in their interactions with colleagues, clients, and the community, establishing themselves as trusted and respected professionals.

PEO 3: Students will apply current tools, technologies, and research methodologies to develop innovative systems that effectively solve industry-specific problems.

PEO 4: Graduates will make positive contributions to society by leveraging their skills and knowledge, improve quality of life, and promote sustainable development.

Programme At the end of this course, students will be able to (POs), Programme Specific At the end of this course, students will be able to (PSOs) and Course At the end of this course, students will be able to (COs) for BCA Programme

PROGRAM OUTCOME (PO'S)

PO1: Critical thinking: Students will be able to identify problems within a given context, break them down into smaller components, and develop creative and innovative solutions.

PO2: Effective Communication: Graduates will demonstrate effective communication and presentation skills, enabling them to articulate technical concepts, document software projects, and collaborate with stakeholders effectively.

PO3: Ethics: Graduates will adhere to ethical standards and professional codes of conduct, demonstrating integrity, responsibility, and respect for privacy and security considerations in computing practice.

PO4: Skilled training and Lifelong Learning: Graduates will recognize the importance of lifelong learning and professional development, staying updated with emerging technologies, industry trends, and best practices to adapt with evolving demands in the field of computer applications.

PROGRAM SPECIFIC OUTCOME (PSO's)

PSO-1: Analyze their abilities in systematic planning, developing, testing and executing complex computing applications in field of Social Media and Analytics, Web Application Development and Data Interpretations.

PSO-2: Apprise in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization and study to address global interest.

PSO-3: Focus on preparing students for roles pertaining to computer applications and IT industry.

COURSE OUTCOME

DEPARTMENT OF BACHELOR OF COMPUTER APPLICATIONS -BCA

Attainment of Outcomes

Computation of CO Attainment

CBCS BATCH 2020-202

SEMESTER-I

Course: Problem Solving Techniques using C

Credits: 2

	At the end of this course, students will be able to
CO1	Understand the fundamentals of programming concepts
CO2	Implement the programming concepts in the form of control statements and functions.
CO3	Demonstrate a simple C program using arrays and strings
CO4	Implement C program using structures and pointers
CO5	Describe the concepts of file and preprocessors

Attainment of Outcomes Computation of CO Attainment

Course: Programming in C
Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand the fundamentals of programming concepts	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	10	PO1 PSO1 PSO2
CO2	To Implement the programming concepts in the form of control statements and functions.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	10	PO2 PSO1 PSO2
CO3	To Demonstrate a simple C program using arrays and strings	<i>Factual/ Conceptual/ Procedural</i>	Understand and Implement	10	PO1 PSO1 PSO2
CO4	To Implement C program using structures and pointers	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	10	PO2 PSO1 PSO2
CO5	To Describe the concepts of file and preprocessors	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	6	PO1 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	T1 (10)	T2 (10)
CO1	2	5	
CO2	2	5	
CO3	2		3
CO4	2		5
CO5	2		2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.6/2	4/5		80
CO2	1.6/2	4/5		80
CO3	1.6/2		2.3/3	78
CO4	1.5/2		3.7/5	75
CO5	1.6/2		1.5/2	78

Attainment of COs from SEE

CO	Class Average in SEE
CO1	50
CO2	50
CO3	50
CO4	50
CO5	50

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.3 * \text{CIE Cl. Ave} + 0.7 * \text{SEE Cl. Ave}$
CO1	80	50	59
CO2	80	50	59
CO3	78	50	58.4
CO4	75	50	57.5
CO5	78	50	58.4

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	60
CO2	59
CO3	58
CO4	57
CO5	58

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	59	60	1
CO2	59	59	0
CO3	58.4	58	-0.6
CO4	57.5	57	-0.5
CO5	58.4	58	-0.6



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	60	1	More assignment to be given	
CO2	59	0		60
CO3	58	-0.6		60
CO4	57	-0.5		59
CO5	58	-0.6		59

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1 PSO2	12
CO2	PO2 PSO1 PSO2	12
CO3	PO1 PSO1 PSO2	12
CO4	PO2 PSO1 PSO2	12
CO5	PO1 PSO1 PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 60 (60%) SESSIONS ARE DEVOTED TO PO1	2
24 OF 60(40%) SESSIONS ARE DEVOTED TO PO2	2
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
C-PRO	2	2											3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1, PSO1,PSO2	59
CO2	PO2, PSO1,PSO2	59
CO3	PO1, PSO1,PSO2	58.4
CO4	PO2,PSO1,PSO2	57.5
CO5	PO1,PSO1,PSO2	58.4



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	36.66
PO2	38,5
PSO1	58,46
PSO2	58.46

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	2	2											3	3			
Attainment	.36	.38											.58	.58			



Course: Digital Electronics**Credits: 2**

	At the end of this course, students will be able to
CO1	To Understand the network theorem and AC and DC fundamentals.
CO2	To Analyse half wave and full wave rectifiers, diodes, registers, semiconductors, ICs, pn junction.
CO3	To Understand the number system, logical gates, sop and pos equations and K-Maps
CO4	To examine half adder and full adder circuits and different ICs truth value.
CO5	To Implement RS flip flop, JK flip flop, m/s flip flop, T flip flop, different types of registers.

Attainment of Outcomes

Computation of CO Attainment

Course: Digital Electronics
Credits: 4

CO	Course Outcome	Knowledge category(<i>Factual/Conceptual/Procedural/Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand the network theorem and AC and DC fundamentals.	<i>Factual/Conceptual/Procedural</i>	Understand and evaluate	10	PO1 PO2 PO3 PSO1 PSO2
CO2	To Analyse half wave and full wave rectifiers, diodes, registers, semiconductors, ICs, pn junction.	<i>Factual/Conceptual/Procedural</i>	Evaluate and Apply	10	PO1 PO2 PO3 PSO1 PSO2
CO3	To Understand the number system, logical gates, sop and pos equations and K-Maps.	<i>Factual/Conceptual/Procedural</i>	Understand and Solve	10	PO1 PO3 PSO1 PSO2
CO4	To examine half adder and full adder circuits and different ICs truth value.	<i>Factual/Conceptual/Procedural</i>	Apply and Implement	10	PO1 PO2 PSO1 PSO2
CO5	To Implement RS flip flop, JK flip flop, m/s flip flop, T flip flop, different types of registers.	<i>Factual/Conceptual/Procedural</i>	Analyse and Apply	6	PO1 PO2 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	T1 (10)	T2 (10)
CO1	2	5	0
CO2	2	5	0
CO3	2	0	3
CO4	2	0	5
CO5	2	0	2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2	3.8/5	0	75
CO2	1.5/2	3.7/5	0	75
CO3	1.5/2	0	2.2/3	76
CO4	1.5/2	0	3.7/5	75
CO5	1.5/2	0	1.5/2	77

Attainment of COs from SEE

CO	Class Average in SEE
CO1	41
CO2	41
CO3	41
CO4	41
CO5	41

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.3 * \text{CIE Cl. Ave} + 0.7 * \text{SEE Cl. Ave}$
CO1	75	41	51.2
CO2	75	41	51.2
CO3	76	41	51.5
CO4	75	41	51.2
CO5	77	14	51.8

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	51
CO2	51
CO3	51
CO4	52
CO5	51

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	51.2	51	-0.8
CO2	51.2	51	-0.8
CO3	51.5	51	-0.5
CO4	51.2	52	0.8
CO5	51.8	51	-0.2



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	51	-0.8		54
CO2	51	-0.8		52
CO3	51	-0.5		53
CO4	52	0.8	More assignment to be given	
CO5	51	-0.2		53

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO2,PO3 PSO1,PSO2	12
CO2	PO1,PO2, PO3, PSO1,PSO2	12
CO3	PO1,PO3 PSO1,PSO2	12
CO4	PO1,PO2 PSO1,PSO2	12
CO5	PO1, PO2 PSO1, PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%)SESSIONS ARE DEVOTED TO PO1	3
48 OF 60(80%) PO3	3
36 OF 60(60%) PO3	2
60 OF 60(100%) PSO1	3
60 OF 60(100%) PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3	3	2										3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO2,PO3 PSO1,PSO2	12
CO2	PO1,PO2, PO3, PSO1,PSO2	12
CO3	PO1,PO3 PSO1,PSO2	12
CO4	PO1,PO2 PSO1,PSO2	12
CO5	PO1, PO2 PSO1, PSO2	12



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	51.9
PO2	51.3
PO3	34
PSO1	51.9
PSO2	51.9

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3	3	2										3	3			
Attainment	.51	51	.34										.52	.52			

Course: Discrete Mathematics

Credits: 3

	At the end of this course, students will be able to
CO1	Ability to apply mathematical logic to solve problems
CO2	<u>Understand</u> sets, relations, functions and discrete structures.
CO3	Solve and use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions
CO4	List and formulate problems to solve recurrence relations
CO5	Discuss model and solve real world problems using graphs and trees.

Attainment of Outcomes

Computation of CO Attainment

Course: Discrete Mathematics
Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand concept of sets, relations and functions and mathematical logic.	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	10	PO1 PSO1 PSO2
CO2	To Implement linear matrices and to solve linear equations	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	10	PO4 PSO1 PSO2
CO3	To Determine permutation and combination problems	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	10	PO1 PSO1 PSO2
CO4	To Interpret groups, subgroups, vectors and their applications	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	10	PO4 PSO1 PSO2
CO5	To Categorize and solve two-dimensional geometry and problem solving.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	6	PO1 PSO1 PSO2



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (20)	S1 (10)	T1 (10)	T2 (10)
CO1	4		5	
CO2	4		5	
CO3	4	5		3
CO4	4	5		5
CO5	4			2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	3.04/4		3.8/5		76
CO2	3/4		3.7/5		75
CO3	3.04/4	3.8/5		2.2/3	76
CO4	3/4	3.7/5		3.7/5	75
CO5	3.08/4			1.5/2	77

Attainment of COs from SEE

CO	Class Average in SEE
CO1	40
CO2	40
CO3	40
CO4	40
CO5	40

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 0.7 * \text{SEE Cl. Ave}$
CO1	76	40	66
CO2	75	40	65.5
CO3	76	40	66
CO4	75	40	65.5
CO5	77	40	66.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	65
CO2	65
CO3	64
CO4	67
CO5	65

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	66	65	-1
CO2	65.5	65	-0.5
CO3	66	64	-2
CO4	65.5	67	1.5
CO5	66.5	65	-1.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	65	-1		66
CO2	65	-0.5		67
CO3	64	-2		65
CO4	67	1.5	Tutorial Class+Previous year QP Solve	
CO5	65	-1.5		68

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1 PSO2	13
CO2	PO3 PSO1 PSO2	13
CO3	PO1 PSO1 PSO2	13
CO4	PO3 PSO1 PSO2	13
CO5	PO1 PSO1 PSO2	13
		65



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
39 OF 65 (60%) SESSIONS ARE DEVOTED TO PO1	2
26 OF 65(40%) SESSIONS ARE DEVOTED TO PO3	2
65 OF 65(100%) SESSIONS ARE DEVOTED TO PSO1	3
65 OF 65(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	2		2										3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1 PSO1 PSO2	66
CO2	PO3,PSO1,PSO2	65.5
CO3	PO1 PSO1 PSO2	66
CO4	PO3 PSO1 PSO2	65.5
CO5	PO1 PSO1 PSO2	66.5

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	44
PO3	43.23
PSO1	66
PSO2	66

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
DM	2		2										3	3			
Attainment	.44		.43										.66	.66			



SEMESTER-III

Course: Object Oriented Programming using C++

Credits: 2

	At the end of this course, students will be able to
CO1	Describe OOPs concepts.
CO2	Use functions and pointers in your C++ program
CO3	Understand tokens, expressions, and control structures.
CO4	Explain arrays and strings and create programs using them.
CO5	Describe and use constructors and destructors

Attainment of Outcomes Computation of CO Attainment

Course: Object Oriented Programming using C++

Credits: 4

CO	Course Outcome	Knowledge category (<i>Factual/ Conceptual/ Procedural/ Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	To understand Object Oriented Programming concepts.	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	12	PO1 PSO1 PSO2
CO2	Implement the concept of classes and objects.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	12	PO2 PSO1 PSO2
CO3	An ability to develop a program using any type of Inheritance.	<i>Factual/ Conceptual/ Procedural</i>	Understand and Implement	12	PO1 PSO1 PSO2
CO4	To Implement C program using functions	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	12	PO2 PSO1 PSO2
CO5	To understand and develop a program using file operations.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	12	PO1 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (5)	S1 (5)	T1 (10)	T2 (10)
CO1	1	0	5	0
CO2	1	0	5	0
CO3	1	5	0	3
CO4	1	0	0	5
CO5	1	0	0	2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (5)	S1 Cl. Ave (5)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	0.86/1		4/5		86
CO2	0.8/1		4/5		80
CO3	0.78/1			2.3/3	78
CO4	0.75/1	3.7/5		3.7/5	75
CO5	0.78/1			1.5/2	78

Attainment of COs from SEE

CO	Class Average in SEE
CO1	56
CO2	56
CO3	56
CO4	56
CO5	56

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.3 * \text{CIE Cl. Ave} + 0.7 * \text{SEE Cl. Ave}$
CO1	86	56	65
CO2	80	56	63.2
CO3	78	56	61.7
CO4	75	56	62.6
CO5	78	56	73.9

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	65
CO2	63
CO3	61
CO4	62
CO5	74

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	65	65	0
CO2	63.2	63	-0.2
CO3	61.7	61	-0.7
CO4	62.6	62	-0.6
CO5	73.9	74	0.1



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	65	0		70
CO2	63	-0.2		65
CO3	61	-0.7		62
CO4	62	-0.6		63
CO5	74	0.1	Previous question paper solved	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1, PSO1, PSO2	12
CO2	PO2, PSO1, PSO2	12
CO3	PO1, PSO1, PSO2	12
CO4	PO2, PSO1, PSO2	12
CO5	PO1, PSO1, PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 out of 60 (60%) sessions are devoted to PO1	2
24 out of 60 (40%) sessions are devoted to PO2	2
60 out of 60 (100%) sessions are devoted to PSO1	3
60 out of 60 (100%) sessions are devoted to PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OOP using C++	2	2											3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1, PSO1, PSO2	65
CO2	PO2, PSO1, PSO2	63.2
CO3	PO1, PSO1, PSO2	61.7
CO4	PO2, PSO1, PSO2	62.6
CO5	PO1, PSO1, PSO2	73.9



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(2/3) * (65 + 61.7 + 73.9) / 3 = 59.64$
PO2	$(2/3) * (63.2 + 62.6) / 2 = 52.36$
PSO1	$(3/3) * (65 + 63.2 + 61.7 + 62.6 + 73.9) / 5 = 65.28$
PSO2	$(3/3) * (65 + 63.2 + 61.7 + 62.6 + 73.9) / 5 = 65.28$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OOP using C++	2	2											3	3			
Attainment	.60	.52											.65	.65			

Course: Financial Accounting and Management**Credits: 2**

	At the end of this course, students will be able to
CO1	Exemplify to prepare and analyse the financial statements
CO2	Acquire the basic concept of accounting terms.
CO3	Journalize the ability to rectify the errors in bank reconciliation statement
CO4	Exposed to various methods of depreciation and insurance accounting
CO5	Demonstrate insight into single and double entry system of accounting

Attainment of Outcomes Computation of CO Attainment

Course: Financial Accounting and Management
Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the role of accounting and its limitations.	Conceptual	Remember	12	PO1,PSO1 PSO2,PSO3
CO2	Prepare Accepted financial statements in Accounting Principles. accordance with Generally	Procedural	Remember and Calculate	12	PO1,PSO1 PSO2,PSO3, PSO4
CO3	Demonstrate knowledge of each step in the accounting cycle	Conceptual	Analyse and Calculate	12	PO1,PSO1 PSO2,PSO3, PSO4
CO4	Support at a basic level the recording and reporting of financial information for business	Factual and procedural	Solve	12	PO1,PSO1 PSO2,PSO3, PSO4
CO5	Demonstrate an understanding the tally in accounts	procedural	Execute	12	PO1,PSO1 PSO2,PSO3, PSO4



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (5)	S1 (5)	T1 (10)	T2 (10)
CO1	1	0	5	0
CO2	1	0	5	0
CO3	1	0	0	3
CO4	1	2	0	3
CO5	1	3	0	4

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (5)	S1 Cl. Ave (5)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	0.8	0	4	0	80
CO2	0.82	0	4.1	0	82
CO3	0.83	0	0	2.49	83
CO4	0.84	1.68	0	2.52	84
CO5	0.85	2.55	0	3.4	85

Attainment of COs from SEE

CO	Class Average in SEE
CO1	53
CO2	53
CO3	53
CO4	53
CO5	53

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.3 * \text{CIE Cl. Ave}$ $+ 0.7 * \text{SEE Cl. Ave}$
CO1	80	53	61.1
CO2	82	53	61.7
CO3	83	53	62
CO4	84	53	62.3
CO5	85	53	62.6

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	61
CO2	61.5
CO3	63
CO4	62
CO5	62.2

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	61.1	61	-0.1
CO2	61.7	61.5	-0.2
CO3	62	63	1
CO4	62.3	62	-0.3
CO5	62.6	62.2	-0.4

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	61	-0.1		65
CO2	61.5	-0.2		68
CO3	63	1	Previous year Question Paper solve	
CO4	62	-0.3		69
CO5	62.2	-0.4		70

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PSO1,PSO2,PSO3	12
CO2	PO1,PSO1, PSO2,PSO3,PSO4	12
CO3	PO1,PSO1,PSO2,PSO3,PSO4	12
CO4	PO1,PSO1,PSO2,PSO3,PSO4	12
CO5	PO1,PSO1,PSO2,PSO3,PSO4	12
		60

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 out of 60(100%) Session are devoted PO1	3
60 out of 60(100%) Session are devoted PSO1	3
60 out of 60(100%) Session are devoted PSO2	3
60 out of 60(100%) Session are devoted PSO3	3
48 out of 60(80%) Session are devoted PSO4	2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
FAM	3	-	-	-	-	-	-	-	-	-	-	-	3	3	3	2	-

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PSO1,PSO2,PSO3	61.1
CO2	PO1,PSO1, PSO2,PSO3,PSO4	61.7
CO3	PO1,PSO1,PSO2,PSO3,PSO4	62
CO4	PO1,PSO1,PSO2,PSO3,PSO4	62.3
CO5	PO1,PSO1,PSO2,PSO3,PSO4	62.6



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(3/3) * (61.1 + 61.7 + 62 + 62.3 + 62.6) / 5 = 61.94$
PSO1	$(3/3) * (61.1 + 61.7 + 62 + 62.3 + 62.6) / 5 = 61.94$
PSO2	$(3/3) * (61.1 + 61.7 + 62 + 62.3 + 62.6) / 5 = 61.94$
PSO3	$(3/3) * (61.1 + 61.7 + 62 + 62.3 + 62.6) / 5 = 61.94$
PSO4	$(2/3) * (61.7 + 62 + 62.3 + 62.6) / 4 = 57$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
FAM	3	-	-	-	-	-	-	-	-	-	-	-	3	3	3	2	-
Attainment	.61	-	-	-	-	-	-	-	-	-	-	-	.61	.61	.61	.57	-



Course: Operating System

Credits: 3

	At the end of this course, students will be able to
CO1	Understand the basic fundamentals of the operating system.
CO2	Comprehend multithreaded programming, process management, process Synchronization
CO3	Learn memory management and storage management.
CO4	Recognize & compare the performance of Scheduling Algorithms
CO5	Identify the features of I/O and File handling methods.

Attainment of Outcomes
Computation of CO Attainment

Course: Operating System

Credits: 4

CO	Course Outcome	Knowledge category (Factual/Conceptual/Procedural/Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the basic fundamentals of the operating system.	Conceptual	Summarize	13	PO1 PSO3
CO2	Comprehend multithreaded programming, process management, process synchronization	Factual Procedural	Understand	13	PO1 PSO1/PSO2
CO3	Learn memory management and storage management.	Conceptual	Examine	13	PO4 PSO2 PO1
CO4	Recognize & Compare the performance of Scheduling Algorithms	Conceptual Procedural	Discuss	13	PO2 PSO2 PO1
CO5	Identify the features of I/O and File handling methods.	Conceptual	Recognize	13	PO2 PSO2 PO4



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (15)	T2 (15)
CO1	2	0	5	0
CO2	2	0	5	0
CO3	2	0	5	5
CO4	2	5	0	5
CO5	2	5	0	5

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (15)	T2 Cl. Ave (15)	CIE Class Average (%)
CO1	1.4	0	3.5	0	70
CO2	1.36	0	3.4	0	68
CO3	1.34	0	3.35	3.35	67
CO4	1.36	3.4	0	3.4	68
CO5	1.38	3.45	0	3.45	69

Attainment of COs from SEE

CO	Class Average in SEE
CO1	53
CO2	53
CO3	53
CO4	53
CO5	53

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1 * \text{SEE Cl. Ave}$
CO1	70	53	88
CO2	68	53	87
CO3	67	53	86.5
CO4	68	53	87
CO5	69	53	87.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	88
CO2	88
CO3	86
CO4	86
CO5	87

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	88	88	0
CO2	87	88	1
CO3	86.5	86	-0.5
CO4	87	86	-1
CO5	87.5	87	-0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	88	0		90
CO2	88	1	Previous Year question papers to be solved	
CO3	86	-0.5		88
CO4	86	-1		87
CO5	87	-0.5		89

CO-PO/PSO Mapping

CO	POs/PSOs	Class Sessions
CO1	PO1, PSO3	13
CO2	PO1, PSO1, PSO2	13
CO3	PO1, PO4, PSO2	13
CO4	PO1, PO2, PSO2	13
CO5	PO2, PSO2, PO4	13
		65



Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
52 out of 65 (80) Session are devoted to PO1	Mapping Strength is 2
26 out of 65 (40) Session are devoted to PO2	Mapping Strength is 2
26 out of 65 (40) Session are devoted to PO4	Mapping Strength is 2
13 out of 65 (20) Session are devoted to PSO1	Mapping Strength is 1
52 out of 65 (80) Session are devoted to PSO2	Mapping Strength is 2
13 out of 65 (20) Session are devoted to PSO3	Mapping Strength is 1

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OSC	2	2		2									1	2	1		

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PSO3	88
CO2	PO1,PSO1,PSO2	87
CO3	PO1,PO4,PSO2	86.5
CO4	PO1,PO2,PSO2	87
CO5	PO2,PSO2,PO4	87.5



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(2/3) * (88 + 87 + 86.5 + 87) / 4 = 79.79$
PO2	$(2/3) * (87 + 87.5) / 2 = 72.75$
PO4	$(2/3) * (86.5 + 87.5) / 2 = 72.58$
PSO1	$(1/3) * (87) / 1 = 29$
PSO2	$(2/3) * (87 + 86.5 + 87 + 87.5) / 4 = 79.75$
PSO3	$(1/3) * (88) / 1 = 29.33$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OSC	2	1		1									1	1	1		
Attainment	.79	.72		.72									.29	.79	.29		

Course: Operation Research**Credits: 3**

	At the end of this course, students will be able to
CO1	Formulate a real-world problem as a mathematical programming model.
CO2	Understand the theoretical workings of the simple method for linear programming and perform iterations of it by hand
CO3	Understand the relationship between a linear program and its dual, including strong duality and complementary slackness
CO4	Perform sensitivity analysis to determine the direction and magnitude of change of a model's optimal solution as the data change
CO5	Solve specialized linear programming problems like the transportation and assignment problems

Attainment of Outcomes
Computation of CO Attainment

Course: OPERATIONS RESEARCH

Credits: 4

CO	Course Outcome	Knowledge category (<i>Factual/Conceptual/Procedural/Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	Formulate a real-world problem as a mathematical programming model.	Conceptual	Summarize	13	PO1 PSO3
CO2	Understand the theoretical workings of the simple method for linear programming and perform iterations of it by hand	Factual /Procedural	Understand	13	PO1 PSO1/PSO2
CO3	Understand the relationship between a linear program and its dual, including strong duality and complementary slackness	Conceptual	Examine	13	PO4 PSO2 PO1
CO4	Perform sensitivity analysis to determine the direction and magnitude of change of a model's optimal solution as the data change	Conceptual/ Procedural	Discuss	13	PO2 PSO2 PO1
CO5	Solve specialized linear programming problems like the transportation and assignment problems	Conceptual	Recognize	13	PO2 PSO2 PO4



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (15)	T2 (15)
CO1	2	0	5	0
CO2	2	0	5	0
CO3	2	0	5	5
CO4	2	5	0	5
CO5	2	5	0	5

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (15)	T2 Cl. Ave (15)	CIE Class Average (%)
CO1	1.64	0	4.1	0	82
CO2	1.6	0	4	0	80
CO3	1.56	0	3.9	3.9	78
CO4	1.56	3.9	0	3.9	78
CO5	1.58	3.95	0	3.95	79

Attainment of COs from SEE

CO	Class Average in SEE
CO1	64
CO2	64
CO3	64
CO4	64
CO5	64



Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.3 \times \text{CIE Cl. Ave} + 0.7 \times \text{SEE Cl. Ave}$
CO1	82	64	69.4
CO2	80	64	68.8
CO3	78	64	68.2
CO4	78	64	68.2
CO5	79	64	68.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	70
CO2	68.5
CO3	68
CO4	68
CO5	68.3

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	69.4	70	0.6
CO2	68.8	68.5	-0.3
CO3	68.2	68	-0.2
CO4	68.2	68	-0.2
CO5	68.5	68.3	-0.2



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	70	0.6	Previous Year question papers to be solved	
CO2	68.5	-0.3		70
CO3	68	-0.2		71
CO4	68	-0.2		71
CO5	68.3	-0.2		70

CO-PO/PSO Mapping

CO	POs/PSOs	Class Sessions
CO1	PO1, PSO3	13
CO2	PO1, PSO1, PSO2	13
CO3	PO1, PO4, PSO2	13
CO4	PO1, PO2, PSO2	13
CO5	PO2, PSO2, PO4	13
		65



Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
52 out of 65 (80) Session are devoted to PO1	Mapping Strength is 2
26 out of 65 (40) Session are devoted to PO2	Mapping Strength is 2
26 out of 65 (40) Session are devoted to PO4	Mapping Strength is 2
13 out of 65 (20) Session are devoted to PSO1	Mapping Strength is 1
52 out of 65 (80) Session are devoted to PSO2	Mapping Strength is 2
13 out of 65 (20) Session are devoted to PSO3	Mapping Strength is 1

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OSC	2	2		2									1	2	1		

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1, PSO3	69.4
CO2	PO1, PSO1, PSO2	68.8
CO3	PO1, PO4, PSO2	68.2
CO4	PO1, PO2, PSO2	68.2
CO5	PO2, PSO2, PO4	68.5



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(2/3) * (69.4 + 68.8 + 68.2 + 68.2) / 4 = 62.86$
PO2	$(2/3) * (68.2 + 68.5) / 2 = 56.98$
PO4	$(2/3) * (68.2 + 68.5) / 2 = 56.98$
PSO1	$(1/3) * (68.8) / 1 = 22.93$
PSO2	$(2/3) * (68.8 + 68.2 + 68.2 + 68.5) / 4 = 62.69$
PSO3	$(1/3) * (69.4) / 1 = 23.13$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OSC	2	1		1									1	1	1		
Attainment	.62	.56		.56									.22	.62	.23		



Course: Unix Shell programming**Credits: 2**

	At the end of this course, students will be able to
CO1	Understand the basic concepts of UNIX Architecture and basic Commands.
CO2	Understand different types of Files, File system and basic file system commands
CO3	Understand the commands related to Shell basics, vi editor and regular expression commands
CO4	Understand the concepts of advance file concepts, commands related to Shell script and filter commands
CO5	Understand the concepts of process and commands related to Perl script.

Attainment of Outcomes

Computation of CO Attainment

Course: Unix Programming

Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the basic concepts of UNIX Architecture and basic Commands.	Conceptual	Report	12	PO1 PSO1
CO2	Understand different types of Files, File system and basic file system commands	Factual/Conceptual	Discuss	12	PO1
CO3	Understand the commands related to Shell basics, vi editor and regular expression commands	Factual/Conceptual/Procedural	Determine	12	PO1 PO4 PSO1
CO4	Understand the concepts of advance file concepts, commands related to Shell script and filter commands.	Factual/Conceptual	Evaluate	12	PO1 PSO3
CO5	Understand the concepts of process and commands related to Perl script.	Factual/Conceptual/Procedural	Build	12	PO1 PO4 PSO3



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (5)	S1 (5)	T1 (10)	T2 (10)
CO1	2		5	1
CO2	2	2	5	2
CO3		3	0	3
CO4	1		0	3
CO5			0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (5)	S1 Cl. Ave (5)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.74/2		3.36/5	0.84/1	87
CO2	1.66/2	1.66/2	4/5	1.6/2	83
CO3		2.52/3	0	2.34/3	84
CO4	0.85/1		0	2.4/3	85
CO5			0	0.75/1	75

Attainment of COs from SEE

CO	Class Average in SEE
CO1	64
CO2	64
CO3	64
CO4	64
CO5	64



Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave}$ $+0.6 * \text{SEE Cl. Ave}$
CO1	87	64	70.9
CO2	83	64	69.7
CO3	84	64	70
CO4	85	64	70.3
CO5	75	64	67.3

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	70
CO2	69
CO3	70
CO4	69
CO5	67

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	70.9	70	-1
CO2	69.7	69	-0.7
CO3	70	70	0
CO4	70.3	69	-1.3
CO5	67.3	67	-0.3



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	70	-1		75
CO2	69	-0.7		70
CO3	70	0		74
CO4	69	-1.3		71
CO5	67	-0.3		69

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1	12
CO2	PO1	12
CO3	PO1 PO4 PSO1	12
CO4	PO1 PSO3	12
CO5	PO1 PO4 PSO3	12
		60



Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 out of 60 (100%) Session are devoted to PO1	Mapping Strength is 3
24 out of 60 (40%) Session are devoted to PO4	Mapping Strength is 2
24 out of 60 (40%) Session are devoted to PSO1	Mapping Strength is 2
24 out of 60 (40%) Session are devoted to PSO3	Mapping Strength is 2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Unix	3	-	-	2	-	-	-	-	-	-	-	-	2	-	2	-	-

CO Attainment and POs/PSOs

CO	POs /PSOs	CO Attainment (%ge)
CO1	PO1 PSO1	70.9
CO2	PO1	69.7
CO3	PO1 PO4 PSO1	70
CO4	PO1 PSO3	70.3
CO5	PO1 PO4 PSO3	67.3



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(3/3) * (70.9 + 69.7 + 70 + 70.3 + 67.3) / 5 = 69.64$
PO4	$(2/3) * (70 + 67.3) / 2 = 56.96$
PSO1	$(2/3) * (70.9 + 70) / 2 = 58.63$
PSO3	$(2/3) * (70.3 + 67.3) / 2 = 57.08$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Unix	3			2									2		2		
Attainment	.69			.56									.58		.57		



SEMESTER-IV

Course: Visual Programming

Credits: 2

	At the end of this course, students will be able to
CO1	Gain the basic knowledge on Visual Basic Applications.
CO2	Understand the variables and data types used in program development
CO3	Explore Visual Basic's Integrated Development Environment (IDE).
CO4	Understanding how to handle events and implement event-driven programming using Visual C++.
CO5	To understand and Construct OLE and ODBC connections

Attainment of Outcomes Computation of CO Attainment

Course: Visual Programming
Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Gain the basic knowledge on Visual Basic Applications.	Factual/ Conceptual/ Procedural	Understand and evaluate	12	PO1 PSO1 PSO2
CO2	Understand the variables and data types used in program development.	Factual/ Conceptual/ Procedural	Evaluate and Apply	12	PO2 PSO1 PSO2
CO3	Explore Visual Basic's Integrated Development Environment (IDE).	Factual/ Conceptual/ Procedural	Understand and Implement	12	PO1 PSO1 PSO2
CO4	Understanding how to handle events and implement event-driven programming using Visual C++.	Factual/ Conceptual/ Procedural	Apply and Implement	12	PO2 PSO1 PSO2
CO5	To understand and Construct OLE and ODBC connections.	Factual/ Conceptual/ Procedural	Analyse and Apply	12	PO1 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (5)	S1 (5)	T1 (10)	T2 (10)
CO1	1	0	5	0
CO2	1	0	5	0
CO3	1	3	0	3
CO4	1	2	0	5
CO5	1	0	0	2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (5)	S1 Cl. Ave (5)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	0.88/1	0	4.4/5	0	88
CO2	0.85/1	0	4.25/5	0	85
CO3	0.78/1	2.34/3	0	2.34/3	78
CO4	0.80/1	1.6/2	0	4/5	80
CO5	0.77/1	0	0	1.54/2	77

Attainment of COs from SEE

CO	Class Average in SEE
CO1	55
CO2	55
CO3	55
CO4	55
CO5	55

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.3 * \text{CIE Cl. Ave} + 0.7 * \text{SEE Cl. Ave}$
CO1	88	55	64.9
CO2	85	55	64
CO3	78	55	61.7
CO4	80	55	62.5
CO5	77	55	61.6

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	64
CO2	64
CO3	61
CO4	62
CO5	61

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	64.9	64	-1
CO2	64	64	0
CO3	61.7	61	-0.7
CO4	62.5	62	-0.5
CO5	61.6	61	-0.6



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	64	-1		70
CO2	64	0		65
CO3	61	-0.7		62
CO4	62	-0.5		64
CO5	61	-0.6		62

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1 PSO2	12
CO2	PO2 PSO1 PSO2	12
CO3	PO1 PSO1 PSO2	12
CO4	PO2 PSO1 PSO2	12
CO5	PO1 PSO1 PSO2	12
		60



Course – PO/PSO Mapping Strength (NOTE: MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 out of 60 (60%) sessions are devoted to PO1	2
24 out of 60 (40%) sessions are devoted to PO2	2
60 out of 60 (100%) sessions are devoted to PSO1	3
60 out of 60 (100%) sessions are devoted to PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Visual Programming	2	2											3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1, PSO1, PSO2	64.9
CO2	PO2, PSO1, PSO2	64
CO3	PO1, PSO1, PSO2	61.7
CO4	PO2, PSO1, PSO2	62.5
CO5	PO1, PSO1, PSO2	61.6



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(2/3) * (64.9 + 61.7 + 61.6) / 3 = 55.52$
PO2	$(2/3) * (64 + 62.5) / 2 = 52.58$
PSO1	$(3/3) * (64.9 + 64 + 61.7 + 62.5 + 61.6) / 5 = 62.94$
PSO2	$(3/3) * (64.9 + 64 + 61.7 + 62.5 + 61.6) / 5 = 62.94$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Visual Programming	2	2											3	3			
Attainment	.55	.52											.62	.62			

Course: Computer Architecture**Credits: 3**

	At the end of this course, students will be able to
CO1	Understand and learn digital Logic circuits, Integrated Circuits and digital functions
CO2	Learn to represent data and perform various data transfer operations
CO3	Identify Basic computer organization and design
CO4	Understand the central processor organization
CO5	Develop Learn Input output organization and memory organization

Attainment of Outcomes Computation of CO Attainment

Course: COMPUTER ARCHITECTURE

Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand and learn digital Logic circuits , Integrated Circuits and digital functions	Conceptual	Understand	12	PO1 PO2 PSO-1 PSO-2
CO2	Learn to represent data and perform various data transfer operations	Factual Conceptual	Understand and apply	12	PO1 PSO1 PSO2
CO3	Identify Basic computer organisation and design	Conceptual Procedural	Understand and apply	12	PO1 PSO1 PSO2 PSO3
CO4	Understand the central processor organization	Conceptual Procedural	Understand	12	PO1 PO2 PSO1
CO5	Develop Learn Input output organization and memory organization	Conceptual Procedural	Examine	12	PO1 PSO1 PSO2 PSO3



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	A2 (10)	T1 (10)	T2 (10)
CO1	2	0	5	0
CO2	1	2	5	0
CO3	2	0	0	4
CO4	2	3	0	4
CO5	3	5	0	2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	A2 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5	0	3.7	0	75
CO2	0.7	1.4	3.7	0	74
CO3	1.4	0	0	2.8	72
CO4	1.4	2.1	0	2.8	71
CO5	2.1	3.5	0	1.4	71

Attainment of COs from SEE

CO	Class Average in SEE
CO1	48
CO2	48
CO3	48
CO4	48
CO5	48

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave}$ $+1 * \text{SEE Cl. Ave}$
CO1	75	48	85.5
CO2	74	48	58.4
CO3	72	48	57.6
CO4	71	48	57.2
CO5	71	48	57.2

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	75
CO2	74
CO3	72
CO4	71
CO5	71

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	85.5	75	-10.5
CO2	58.4	74	15.6
CO3	57.6	72	14.4
CO4	57.2	71	13.8
CO5	57.2	71	13.8



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	75	-10.5		78
CO2	74	15.6	Remedial classes & Peer Learning and Seminars to be given	
CO3	72	14.4	Previous year question papers to be solved Remedial classes	
CO4	71	13.8	More Assignments to be given	
CO5	71	13.8	Remedial classes Peer Learning and Seminars to be given	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO2,PSO-1, PSO-2	12
CO2	PO1,PSO1, PSO2	12
CO3	PO1,PSO1,PSO2,PSO3	12
CO4	PO1,PO2,PSO1	12
CO5	PO1,PSO1,PSO2,PSO3	12
		60

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OUT OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
24 OUT OF 60(40%) SESSIONS ARE DEVOTED TO PO2	1
60 OUT OF 60 (100%) SESSIONS ARE DEVOTED TO PSO1	3
48 OUT OF 60 (80%) SESSIONS ARE DEVOTED TO PSO2	2
24 OUT OF 60 (40%) SESSIONS ARE DEVOTED TO PSO3	2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1	-	-	-	-	-	-	-	-	-	-	3	2	2	-	-

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO2,PSO-1,PSO-2	85.5
CO2	PO1,PSO1,PSO2	58.4
CO3	PO1,PSO1,PSO2,PSO3	57.6
CO4	PO1,PO2,PSO1	57.2
CO5	PO1,PSO1,PSO2,PSO3	57.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	63
PO2	40
PSO1	63
PSO2	39
PSO3	39

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1	-	-	-	-	-	-	-	-	-	-	3	2	2	-	-
Attainment	.63	.4	-	-	-	-	-	-	-	-	-	-	.63	.39	.39	-	-



SEMESTER-V

Course: Data Communication and Networks

Credits: 3

	At the end of this course, students will be able to
CO1	Explain the transmission technique of digital data between two or more computers
CO2	Understand how a computer network that allows computers to exchange data.
CO3	Apply the basics of data communication and various types of computer networks in real world applications.
CO4	Apply the basics of data communication and various types of computer networks in real world applications.
CO5	Compare the key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.

Attainment of Outcomes

Computation of CO Attainment

Course: DCN

Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Explain the transmission technique of digital data between two or more computers	Conceptual	Understand	12	PO1 PO2 PSO-1 PSO-2
CO2	Understand how a computer network that allows computers to exchange data.	Factual Conceptual	Understand and apply	12	PO1 PSO1 PSO2
CO3	Apply the basics of data communication and various types of computer networks in real world applications.	Conceptual Procedural	Understand and apply	12	PO1 PSO1 PSO2 PSO3
CO4	Learn and Compare the different layers of protocols.	Conceptual Procedural	Understand	12	PO1 PO2 PSO1
CO5	Compare the key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.	Conceptual Procedural	Examine	12	PO1 PSO1 PSO2 PSO3



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	A2 (10)	T1 (10)	T2 (10)
CO1	2	0	5	0
CO2	1	2	5	0
CO3	2	0	0	4
CO4	2	3	0	4
CO5	3	5	0	2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	A2 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5	0	3.7	0	75
CO2	0.7	1.4	3.7	0	74
CO3	1.4	0	0	2.8	72
CO4	1.4	2.1	0	2.8	71
CO5	2.1	3.5	0	1.4	71

Attainment of COs from SEE

CO	Class Average in SEE
CO1	48
CO2	48
CO3	48
CO4	48
CO5	48

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1 * \text{SEE Cl. Ave}$
CO1	75	48	85.5
CO2	74	48	58.4
CO3	72	48	57.6
CO4	71	48	57.2
CO5	71	48	57.2

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	75
CO2	74
CO3	72
CO4	71
CO5	71

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	85.5	75	-10.5
CO2	58.4	74	15.6
CO3	57.6	72	14.4
CO4	57.2	71	13.8
CO5	57.2	71	13.8

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	75	-10.5		78
CO2	74	15.6	Remedial classes & Peer Learning and Seminars to be given	
CO3	72	14.4	Previous year question papers to be solved Remedial classes	
CO4	71	13.8	More Assignments to be given	
CO5	71	13.8	Remedial classes Peer Learning and Seminars to be given	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO2,PSO-1, PSO-2	12
CO2	PO1,PSO1, PSO2	12
CO3	PO1,PSO1,PSO2,PSO3	12
CO4	PO1,PO2,PSO1	12
CO5	PO1,PSO1,PSO2,PSO3	12
		60

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OUT OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
24 OUT OF 60(40%) SESSIONS ARE DEVOTED TO PO2	1
60 OUT OF 60 (100%) SESSIONS ARE DEVOTED TO PSO1	3
48 OUT OF 60 (80%) SESSIONS ARE DEVOTED TO PSO2	2
24 OUT OF 60 (40%) SESSIONS ARE DEVOTED TO PSO3	2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1											3	2	2		

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO2,PSO-1,PSO-2	85.5
CO2	PO1,PSO1,PSO2	58.4
CO3	PO1,PSO1,PSO2,PSO3	57.6
CO4	PO1,PO2,PSO1	57.2
CO5	PO1,PSO1,PSO2,PSO3	57.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	63
PO2	40
PSO1	63
PSO2	39
PSO3	39

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1	-	-	-	-	-	-	-	-	-	-	3	2	2	-	-
Attainment	.63	.4	-	-	-	-	-	-	-	-	-	-	.63	.39	.39	-	-



Course: Java Programming

Credits: 2

	At the end of this course, students will be able to
CO1	Understand the concepts related to Java Technology
CO2	Explore and understand use of Java Server Programming.
CO3	Identify the procedures and exploring the programming concepts of oops
CO4	learn skills to develop real time applications
CO5	Develop advanced skills for programming in Java

Attainment of Outcomes

Computation of CO Attainment

Course: OBJECT ORIENTED PROGRAMMING USING JAVA
Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the concepts related to Java Technology	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	12	PO1 PO4 PSO1 PSO2
CO2	Explore and understand use of Java Server Programming.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	12	PO1 PO4 PSO1 PSO2
CO3	Identify the procedures and exploring the programming concepts of oops	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	12	PO1 PO4 PSO1 PSO2
CO4	learn skills to develop real time applications	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	12	PO1 PO4 PSO1 PSO2
CO5	Develop advanced skills for programming in Java	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	12	PO1 PO4 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	T1 (20)	T2 (20)
CO1	2	10	0
CO2	2	10	0
CO3	2	0	10
CO4	2	0	10
CO5	2	0	0

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (20)	T2 Cl. Ave (20)	CIE Class Average (%)
CO1	1.6/2	8/10	0	80
CO2	1.62/2	8.1/10	0	81
CO3	1.6/2	0	8/10	80
CO4	1.64/2	0	8.2/10	82
CO5	1.62/2	0	0	81

Attainment of COs from SEE

CO	Class Average in SEE
CO1	57
CO2	57
CO3	57
CO4	57
CO5	57

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1.0 * \text{SEE Cl. Ave}$
CO1	80	57	97
CO2	81	57	97.5
CO3	80	57	97
CO4	82	57	98
CO5	81	57	97.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	98
CO2	98
CO3	97
CO4	97
CO5	97

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	97	98	1
CO2	97.5	98	0.5
CO3	97	97	0
CO4	98	97	-1
CO5	97.5	97	-0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	98	1	More assignment to be given	
CO2	98	0.5	Remedial Class	
CO3	97	0		98
CO4	97	-1		98
CO5	97	-0.5		99

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1, PO4, PSO1, PSO2	12
CO2	PO1, PO4, PSO1, PSO2	12
CO3	PO1, PO4, PSO1, PSO2	12
CO4	PO1, PO4, PSO1, PSO2	12
CO5	PO1, PO4, PSO1, PSO2	12
		60

Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%)SESSIONS ARE DEVOTED TO PO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PO4	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3			3									3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1, PO4, PSO1,PSO2	97
CO2	PO1,PO4,PSO1,PSO2	97.5
CO3	PO1,PO4,PSO1,PSO2	97
CO4	PO1,PO4,PSO1,PSO2	98
CO5	PO1,PO4,PSO1,PSO2	97.5

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	97.4
PO4	97.4
PSO1	97.4
PSO2	97.4

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3	-	-	3	-	-	-	-	-	-	-	-	3	3	-	-	-
Attainment	.98	-	-	.98	-	-	-	-	-	-	-	-	.98	.98	-	-	-

Course: Microprocessor and Assembly Language

Credits: 2

	At the end of this course, students will be able to
CO1	Understand the Architecture and operations of 8085 Microprocessor
CO2	Explore the programming model of and instruction classification and instruction format of 8085 Microprocessor
CO3	Identify the different programming techniques of 8085 Processor
CO4	Understand the Memory interface of Microprocessor
CO5	Develop and Identify Interfacing of peripherals and its applications

Attainment of Outcomes

Computation of CO Attainment

Course: MICROPROCESSOR AND ASSEMBLY LANGUAGE
Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the Architecture and operations of 8085 Microprocessor	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	12	PO1 PO2 PO3 PSO1 PSO2
CO2	Explore the programming model of and instruction classification and instruction format of 8085 Microprocessor	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	12	PO1 PO2 PO3 PSO1 PSO2
CO3	Identify the different programming techniques of 8085 Processor	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	12	PO1 PO3 PSO1 PSO2
CO4	Understand the Memory interface of Microprocessor	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	12	PO1 PO2 PSO1 PSO2
CO5	Develop and Identify Interfacing of peripherals and its applications	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	12	PO1 PO2 PSO1 PSO2



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (10)	T1 (20)	T2 (20)
CO1	2	10	0
CO2	2	10	0
CO3	2	0	10
CO4	2	0	10
CO5	2	0	0

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (20)	T2 Cl. Ave (20)	CIE Class Average (%)
CO1	1.6/2	8/10	0	80
CO2	1.62/2	8.1/10	0	81
CO3	1.6/2	0	8/10	80
CO4	1.64/2	0	8.2/10	82
CO5	1.62/2	0	0	81

Attainment of COs from SEE

CO	Class Average in SEE
CO1	45
CO2	45
CO3	45
CO4	45
CO5	45



Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave}$ $+1.0 * \text{SEE Cl. Ave}$
CO1	80	45	85
CO2	81	45	85.5
CO3	80	45	85
CO4	82	45	86
CO5	81	45	85.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	85
CO2	85
CO3	86
CO4	85
CO5	86

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	85	85	0
CO2	85.5	85	-0.5
CO3	85	86	1
CO4	86	85	-1
CO5	85.5	86	0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	85	0		86
CO2	85	-0.5		87
CO3	86	1	More assignment to be given	
CO4	85	-1		87
CO5	86	0.5	Remedial Class	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO2,PO3 PSO1,PSO2	12
CO2	PO1,PO2,PO3, PSO1,PSO2	12
CO3	PO1,PO3,PSO1 PSO2	12
CO4	PO1,PO2,PSO1 PSO2	12
CO5	PO1,PO2, PSO1 PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
48 OF 60(80%) SESSIONS ARE DEVOTED TO PO2	3
36 OF 60(60%) SESSIONS ARE DEVOTED TO PO3	2
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3	3	2										3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO2,PO3 PSO1,PSO2	85
CO2	PO1,PO2,PO3, PSO1,PSO2	85.5
CO3	PO1,PO3,PSO1 PSO2	85
CO4	PO1,PO2,PSO1 PSO2	86
CO5	PO1,PO2, PSO1 PSO2	85.5

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	84.4
PO2	82.1
PO3	81
PSO1	82.6
PSO2	83.9

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3	3	2										3	3			
Attainment	.84	.82	.81										.82	.82			



Course: Software Engineering

Credits: 3

	At the end of this course, students will be able to
CO1	Discuss Software engineering development Life Cycles
CO2	Recognizing to work on different applications domains
CO3	Demonstrate software engineering concepts
CO4	Implement models and techniques
CO5	Examine tools and techniques

Attainment of Outcomes

Computation of CO Attainment

Course: Software Engineering

Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Discuss Software engineering development Life Cycles	Conceptual	Understand	12	PO1,PSO1
CO2	Recognizing to work on different applications domains	Factual Conceptual	Understand and apply	12	PO1,PO4,PSO2
CO3	Demonstrate software engineering concepts	Conceptual Procedural	Understand and apply	12	PO1, PSO1, PSO2
CO4	Implement models and techniques	Conceptual Procedural	Understand	12	PO1,PO4, PSO1,
CO5	Examine tools and techniques	Conceptual Procedural	Examine	12	PO1, PSO1



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (10)	A2 (10)	T1 (10)	T2 (10)
CO1	2	2	5	1
CO2	2	2	5	2
CO3	2	2	0	3
CO4	2	2	0	3
CO5	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	A2 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2	1.5/2	4/5	0.8/1	75
CO2	1.5/2	1.5/2	4/5	1.5/2	74
CO3	1.4/2	1.4/2	0	2/3	72
CO4	1.4/2	1.4/2	0	2/3	71
CO5	1.4/2	1.4/2	0	0.71/1	71

Attainment of COs from SEE

CO	Class Average in SEE
CO1	50
CO2	50
CO3	50
CO4	50
CO5	50



Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave}$ $+1 * \text{SEE Cl. Ave}$
CO1	75	50	87.5
CO2	74	50	59.6
CO3	72	50	58.8
CO4	71	50	58.4
CO5	71	50	58.4

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	75
CO2	74
CO3	72
CO4	71
CO5	71

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	87.5	75	-12.5
CO2	59.6	74	14.4
CO3	58.8	72	13.2
CO4	58.4	71	12.6
CO5	58.4	71	12.6



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	75	-12.5		80
CO2	74	14.4	Remedial classes & Peer Learning and Seminars to be given	
CO3	72	13.2	Previous year question papers to be solved Remedial classes	
CO4	71	12.6	More Assignments to be given	
CO5	71	12.6	Remedial classes Peer Learning and Seminars to be given	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1, PSO1	12
CO2	PO1, PO4, PSO2	12
CO3	PO1, PSO1, PSO2	12
CO4	PO1, PO4, PSO1,	12
CO5	PO1, PSO1	12
		60

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OUT OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
24 OUT OF 60 (40%) SESSIONS ARE DEVOTED TO PO4	1
48 OUT OF 60 (80%) SESSIONS ARE DEVOTED TO PSO1	3
24 OUT OF 42 (40%) SESSIONS ARE DEVOTED TO PSO2	2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1											3	2	2		

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PSO1	87.5
CO2	PO1,PO4,PSO2	59.6
CO3	PO1, PSO1, PSO2	58.8
CO4	PO1,PO4, PSO1,	58.4
CO5	PO1, PSO1	58.4

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	63
PO4	40
PSO1	63
PSO2	39

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1	-	-	-	-	-	-	-	-	-	-	3	2	2	-	-
Attainment	.63	.4	-	-	-	-	-	-	-	-	-	-	.63	.39	.39	-	-

Course: Cryptography and Network Security**Credits: 3**

	At the end of this course, students will be able to
CO1	To Understand matrices and integer mathematics
CO2	To Analyse DES and AES structure.
CO3	To Understand the use of modern block cyphers
CO4	To examine MD hash family, digital signature and Key management
CO5	To Implement PGP, Email, ssl, tls architecture.

Attainment of Outcomes

Computation of CO Attainment

Course: CRYPTOGRAPHY AND NETWORK SECURITY
Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand matrices and integer mathematics.	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	12	PO1 PO4 PSO1 PSO2
CO2	To Analyse DES and AES structure.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	12	PO1 PO4 PSO1 PSO2
CO3	To Understand the use of modern block cyphers.	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	12	PO1 PO4 PSO1 PSO2
CO4	To examine MD hash family, digital signature and Key management.	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	12	PO1 PO4 PSO1 PSO2
CO5	To Implement PGP, Email, ssl, tls architecture.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	12	PO1 PO4 PSO1 PSO2



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (10)	T1 (20)	T2 (20)
CO1	2	10	0
CO2	2	10	0
CO3	2	0	10
CO4	2	0	10
CO5	2	0	0

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (20)	T2 Cl. Ave (20)	CIE Class Average (%)
CO1	1.6/2	8/10	0	80
CO2	1.62/2	8.1/10	0	81
CO3	1.6/2	0	8/10	80
CO4	1.64/2	0	8.2/10	82
CO5	1.62/2	0	0	81

Attainment of COs from SEE

CO	Class Average in SEE
CO1	57
CO2	57
CO3	57
CO4	57
CO5	57

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1.0 * \text{SEE Cl. Ave}$
CO1	80	57	97
CO2	81	57	97.5
CO3	80	57	97
CO4	82	57	98
CO5	81	57	97.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	98
CO2	98
CO3	97
CO4	97
CO5	97

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	97	98	1
CO2	97.5	98	0.5
CO3	97	97	0
CO4	98	97	-1
CO5	97.5	97	-0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	98	1	More assignment to be given	
CO2	98	0.5	Remedial Class	
CO3	97	0		98
CO4	97	-1		98
CO5	97	-0.5		99

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO4,PSO1,PSO2	12
CO2	PO1,PO4,PSO1,PSO2	12
CO3	PO1,PO4,PSO1,PSO2	12
CO4	PO1,PO4,PSO1,PSO2	12
CO5	PO1,PO4,PSO1,PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PO4	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3			3									3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO4,PSO1,PSO2	97
CO2	PO1,PO4,PSO1,PSO2	97.5
CO3	PO1,PO4,PSO1,PSO2	97
CO4	PO1,PO4,PSO1,PSO2	98
CO5	PO1,PO4,PSO1,PSO2	97.5

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	97.4
PO4	97.4
PSO1	97.4
PSO2	97.4

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3			3									3	3			
Attainment	.98			.98									.98	.98			

Course: System Programming

Credits: 3

	At the end of this course, students will be able to
CO1	To Understand the fundamentals of machine structure and programming structure.
CO2	To Implement the different searching and sorting technique.
CO3	To Demonstrate micro and macro processor
CO4	To Implement absolute loader and data structure
CO5	To Describe phases of compiler.

Attainment of Outcomes

Computation of CO Attainment

Course: SYSTEM PROGRAMMING
Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand the fundamentals of machine structure and programming structure.	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	12	PO1 PO2 PO3 PSO1 PSO2
CO2	To Implement the different searching and sorting technique.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	12	PO1 PO2 PO3 PSO1 PSO2
CO3	To Demonstrate micro and macro processor	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	12	PO1 PO3 PSO1 PSO2
CO4	To Implement absolute loader and data structure.	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	12	PO1 PO2 PSO1 PSO2
CO5	To Describe phases of compiler.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	12	PO1 PO2 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	T1 (20)	T2 (20)
CO1	2	10	0
CO2	2	10	0
CO3	2	0	10
CO4	2	0	10
CO5	2	0	0

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (20)	T2 Cl. Ave (20)	CIE Class Average (%)
CO1	1.6/2	8/10	0	80
CO2	1.62/2	8.1/10	0	81
CO3	1.6/2	0	8/10	80
CO4	1.64/2	0	8.2/10	82
CO5	1.62/2	0	0	81

Attainment of COs from SEE

CO	Class Average in SEE
CO1	45
CO2	45
CO3	45
CO4	45
CO5	45

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1.0 * \text{SEE Cl. Ave}$
CO1	80	45	85
CO2	81	45	85.5
CO3	80	45	85
CO4	82	45	86
CO5	81	45	85.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	85
CO2	85
CO3	86
CO4	85
CO5	86

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	85	85	0
CO2	85.5	85	-0.5
CO3	85	86	1
CO4	86	85	-1
CO5	85.5	86	0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	85	0		86
CO2	85	-0.5		87
CO3	86	1	More assignment to be given	
CO4	85	-1		87
CO5	86	0.5	Remedial Class	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1, PO2, PO3, PSO1, PSO2	12
CO2	PO1, PO2, PO3, PSO1, PSO2	12
CO3	PO1, PO3, PSO1, PSO2	12
CO4	PO1, PO2, PSO1, PSO2	12
CO5	PO1, PO2, PSO1, PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
48 OF 60(80%) SESSIONS ARE DEVOTED TO PO2	3
36 OF 60(60%) SESSIONS ARE DEVOTED TO PO3	2
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3	3	2										3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1, PO2,PO3,PSO1,PSO2	85
CO2	PO1,PO2,PO3,PSO1,PSO2	85.5
CO3	PO1,PO3,PSO1,PSO2	85
CO4	PO1,PO2,PSO1,PSO2	86
CO5	PO1,PO2,PSO1,PSO2	85.5



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	84.4
PO2	82.1
PO3	81
PSO1	82.6
PSO2	83.9

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3	3	2										3	3			
Attainment	.84	.82	.81										.82	.82			



SEMESTER-VI

Course: Theory of Computation

Credits: 3

	At the end of this course, students will be able to
CO1	To Understand concept of finite automata
CO2	To Implement regular Expression application
CO3	To understand context free grammars
CO4	To Interpret properties of CFL
CO5	To implement programming technique for turing machines.

Attainment of Outcomes

Computation of CO Attainment

Course: Theory Of Computation

Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand concept of finite automata	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	12	PO1 PO4 PSO1 PSO2
CO2	To Implement regular Expression application	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	12	PO1 PO4 PSO1 PSO2
CO3	To understand context free grammars	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	12	PO1 PO4 PSO1 PSO2
CO4	To Interpret properties of CFL	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	12	PO1 PO4 PSO1 PSO2
CO5	To implement programming technique for turing machines.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	12	PO1 PO4 PSO1 PSO2



CO Attainment

Direct Attainment of COs Assessment Plan for CIE

CO	A1 (10)	T1 (20)	T2 (20)
CO1	2	10	0
CO2	2	10	0
CO3	2	0	10
CO4	2	0	10
CO5	2	0	0

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (20)	T2 Cl. Ave (20)	CIE Class Average (%)
CO1	1.6/2	8/10	0	80
CO2	1.62/2	8.1/10	0	81
CO3	1.6/2	0	8/10	80
CO4	1.64/2	0	8.2/10	82
CO5	1.62/2	0	0	81

Attainment of COs from SEE

CO	Class Average in SEE
CO1	57
CO2	57
CO3	57
CO4	57
CO5	57

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1.0 * \text{SEE Cl. Ave}$
CO1	80	57	97
CO2	81	57	97.5
CO3	80	57	97
CO4	82	57	98
CO5	81	57	97.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	98
CO2	98
CO3	97
CO4	97
CO5	97

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	97	98	1
CO2	97.5	98	0.5
CO3	97	97	0
CO4	98	97	-1
CO5	97.5	97	-0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	98	1	More assignment to be given	
CO2	98	0.5	Remedial Class	
CO3	97	0		98
CO4	97	-1		98
CO5	97	-0.5		99

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO4,PSO1,PSO2	12
CO2	PO1,PO4,PSO1,PSO2	12
CO3	PO1,PO4,PSO1,PSO2	12
CO4	PO1,PO4,PSO1,PSO2	12
CO5	PO1,PO4,PSO1,PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PO4	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3			3									3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO4,PSO1,PSO2	97
CO2	PO1,PO4,PSO1,PSO2	97.5
CO3	PO1,PO4,PSO1,PSO2	97
CO4	PO1,PO4,PSO1,PSO2	98
CO5	PO1,PO4,PSO1,PSO2	97.5

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	97.4
PO4	97.4
PSO1	97.4
PSO2	97.4

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3			3									3	3			
Attainment	.98			.98									.98	.98			



Course: Web Programming

Credits: 2

	At the end of this course, students will be able to
CO1	To Understand concept of WEB browser and WEB server
CO2	To Implement html and css
CO3	To Interpret JS environment and DOM2
CO4	To understand concept of java script.
CO5	To implement xml document with css.

Attainment of Outcomes Computation of CO Attainment

Course: WEB PROGRAAMMING

Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand concept of WEB browser and WEB server	Factual/ Conceptual/ Procedural	Understand and evaluate	12	PO1 PO4 PSO1 PSO2
CO2	To Implement html and css	Factual/ Conceptual/ Procedural	Evaluate and Apply	12	PO1 PO4 PSO1 PSO2
CO3	To understand concept of java script.	Factual/ Conceptual/ Procedural	Understand and Solve	12	PO1 PO4 PSO1 PSO2
CO4	To Interpret JS environment and DOM2	Factual/ Conceptual/ Procedural	Apply and Implement	12	PO1 PO4 PSO1 PSO2
CO5	To implement xml document with css.	Factual/ Conceptual/ Procedural	Analyse and Apply	12	PO1 PO4 PSO1 PSO2



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	T1 (20)	T2 (20)
CO1	2	10	0
CO2	2	10	0
CO3	2	0	10
CO4	2	0	10
CO5	2	0	0

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	T1 Cl. Ave (20)	T2 Cl. Ave (20)	CIE Class Average (%)
CO1	1.6/2	8/10	0	80
CO2	1.62/2	8.1/10	0	81
CO3	1.6/2	0	8/10	80
CO4	1.64/2	0	8.2/10	82
CO5	1.62/2	0	0	81

Attainment of COs from SEE

CO	Class Average in SEE
CO1	57
CO2	57
CO3	57
CO4	57
CO5	57

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.5 * \text{CIE Cl. Ave} + 1.0 * \text{SEE Cl. Ave}$
CO1	80	57	97
CO2	81	57	97.5
CO3	80	57	97
CO4	82	57	98
CO5	81	57	97.5

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	98
CO2	98
CO3	97
CO4	97
CO5	97

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	97	98	1
CO2	97.5	98	0.5
CO3	97	97	0
CO4	98	97	-1
CO5	97.5	97	-0.5



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	98	1	More assignment to be given	
CO2	98	0.5	Remedial Class	
CO3	97	0		98
CO4	97	-1		98
CO5	97	-0.5		99

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO4,PSO1,PSO2	12
CO2	PO1,PO4,PSO1,PSO2	12
CO3	PO1,PO4,PSO1,PSO2	12
CO4	PO1,PO4,PSO1,PSO2	12
CO5	PO1,PO4,PSO1,PSO2	12
		60



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PO4	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO1	3
60 OF 60(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3			3									3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO4,PSO1,PSO2	97
CO2	PO1,PO4,PSO1,PSO2	97.5
CO3	PO1,PO4,PSO1,PSO2	97
CO4	PO1,PO4,PSO1,PSO2	98
CO5	PO1,PO4,PSO1,PSO2	97.5

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	97.4
PO4	97.4
PSO1	97.4
PSO2	97.4

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3			3									3	3			
Attainment	.98			.98									.98	.98			

Vision

To pursue teaching-learning environment for providing best opportunity for the students to become skilled professionals and to strive the requirements of emerging IT skills.

Mission

“To strive for teaching students about computing with a focus on ethics, professional skills and technical knowledge to get them ready for jobs according to industry standards.”

PROGRAM EDUCATIONAL OBJECTIVE

PEO 1: To acquire in-depth knowledge and expertise in their specialized area, allowing them to make significant contributions in their profession.

PEO 2: The Program will adhere to high ethical standards and demonstrate professionalism in their interactions with colleagues, clients, and the community, establishing themselves as trusted and respected professionals.

PEO 3: Students will apply current tools, technologies, and research methodologies to develop innovative systems that effectively solve industry-specific problems.

PEO 4: Graduates will make positive contributions to society by leveraging their skills and knowledge, improve quality of life, and promote sustainable development.

Programme At the end of this course, students will be able to (POs), Programme Specific At the end of this course, students will be able to (PSOs) and Course At the end of this course, students will be able to (COs) for BCA Programme

PROGRAM OUTCOME (PO'S)

PO1: Critical thinking: Students will be able to identify problems within a given context, break them down into smaller components, and develop creative and innovative solutions.

PO2: Effective Communication: Graduates will demonstrate effective communication and presentation skills, enabling them to articulate technical concepts, document software projects, and collaborate with stakeholders effectively.

PO3: Ethics: Graduates will adhere to ethical standards and professional codes of conduct, demonstrating integrity, responsibility, and respect for privacy and security considerations in computing practice.

PO4: Skilled training and Lifelong Learning: Graduates will recognize the importance of lifelong learning and professional development, staying updated with emerging technologies, industry trends, and best practices to adapt with evolving demands in the field of computer applications.

PROGRAM SPECIFIC OUTCOME (PSO's)

PSO-1: Analyze their abilities in systematic planning, developing, testing and executing complex computing applications in field of Social Media and Analytics, Web Application Development and Data Interpretations.

PSO-2: Apprise in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization and study to address global interest.

PSO-3: Focus on preparing students for roles pertaining to computer applications and IT industry.

COURSE AT THE END OF THIS COURSE, STUDENTS WILL BE ABLE TO**DEPARTMENT OF BACHELOR OF COMPUTER APPLICATIONS****Attainment of At the end of this course, students will be able to****Computation of CO Attainment****NEP BATCH 2021-2024****SEMESTER-I****Course: Programming in C****Credits: 4**

	On successful completion of the course, the student will demonstrate:
CO1	Understand the fundamentals of programming concepts
CO2	Implement the programming concepts in the form of control statements and functions.
CO3	Demonstrate a simple C program using arrays and strings
CO4	Implement C program using structures and pointers
CO5	Describe the concepts of file and preprocessors

**Attainment of Outcomes
 Computation of CO Attainment**

Course: Programming in C

Credits: 4

CO	Course Outcome	Knowledge category (<i>Factual/ Conceptual/ Procedural/ Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand the fundamentals of programming concepts	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	10	PO1 PSO1 PSO2
CO2	To Implement the programming concepts in the form of control statements and functions.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	10	PO2 PSO1 PSO2
CO3	To Demonstrate a simple C program using arrays and strings	<i>Factual/ Conceptual/ Procedural</i>	Understand and Implement	10	PO1 PSO1 PSO2
CO4	To Implement C program using structures and pointers	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	10	PO2 PSO1 PSO2
CO5	To Describe the concepts of file and preprocessors	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	6	PO1 PSO1 PSO2

CO Attainment
Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	2		5	
CO2	2		5	
CO3	2	5		3
CO4	2	5		5
CO5	2			2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.6/2		4/5		80
CO2	1.6/2		4/5		80
CO3	1.6/2	3.9/5		2.3/3	78
CO4	1.5/2	3.7/5		3.7/5	75
CO5	1.6/2			1.5/2	78

Attainment of COs from SEE

CO	Class Average in SEE
CO1	62
CO2	62
CO3	62
CO4	62
CO5	62

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	80	62	69.2
CO2	80	62	69.2
CO3	78	62	68.4
CO4	75	62	67.2
CO5	78	62	68.4

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	70
CO2	69
CO3	68
CO4	67
CO5	68

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	69.2	70	0.8
CO2	69.2	69	-0.8
CO3	68.4	68	-0.6
CO4	67.2	67	-0.8
CO5	68.4	68	-0.6

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	70	0.8	More assignment to be given	
CO2	69	-0.8		70
CO3	68	-0.6		70
CO4	67	-0.8		69
CO5	68	-0.6		69

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1 PSO2	10
CO2	PO2 PSO1 PSO2	10
CO3	PO1 PSO1 PSO2	10
CO4	PO2 PSO1 PSO2	10
CO5	PO1 PSO1 PSO2	6
		46

Course – PO/PSO Mapping Strength (NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
20 OF 46(43%) SESSIONS ARE DEVOTED TO PO2	2
46 OF 46(100%) SESSIONS ARE DEVOTED TO PSO1	3
46 OF 46(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
C-PRO	3	2											3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1 PSO1 PSO2	69.2
CO2	PO2 PSO1 PSO2	69.2
CO3	PO1 PSO1 PSO2	68.4
CO4	PO2 PSO1 PSO2	67.2
CO5	PO1 PSO1 PSO2	68.4

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	68.66
PO2	45.47
PSO1	68.48
PSO2	68.48

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3	2											3	3			
Attainment	.69	.45											.68	.68			

Course: Fundamentals of Computer**Credits: 4**

	At the end of this course, students will be able to
CO1	Understand Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontroller.
CO2	Analyse Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
CO3	Understand Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
CO4	To examine Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching.
CO5	Implement Web Programming basics, Introduction of HTML and CSS programming.

Attainment of Outcomes

Computation of CO Attainment

Course: Fundamentals of Computers

Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	To understand Introduction to computers, anatomy of computer, constituents and architecture, microcontrollers.	Factual/ Conceptual/ Procedural	Understand and evaluate	10	PO1 PO3 PSO1 PSO2
CO2	To understand basic Computer terminology and knowledge of basic hardware peripherals	Factual/ Conceptual/ Procedural	Evaluate and apply	10	PO3 PSO1 PSO2
CO3	To Analyse Operating systems, functions and classification of OS, kernel, shell, basics of Unix, shell programming, booting	Factual/ Conceptual/ Procedural	Understand and Solve	10	PO1 PO3 PSO1 PSO2
CO4	To understand Databases, why database is used, users, Introduction of SQL, data types in SQL, queries in SQL	Factual/ Conceptual/ Procedural	Evaluate	10	PO4 PO3 PSO1 PSO2
CO5	To Examine Internet basics, features, applications, services, ISP, domain name system. To Implement Web Programming basics, introduction of HTML and CSS programming.	Factual/ Conceptual/ Procedural	Build	6	PO1 PO3 PSO1 PSO2



CO Attainment Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (20)	T2 (20)
CO1	2		5	
CO2	2		5	
CO3	2	5		3
CO4	2	5		5
CO5	2			2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2		3.8/5		77
CO2	1.5/2		3.7/5		75
CO3	1.5/2	3.8/5		2.2/3	76
CO4	1.5/2	3.7/5		3.7/5	75
CO5	1.5/2			1.5/2	75

Attainment of COs from SEE

CO	Class Average in SEE
CO1	57
CO2	57
CO3	57
CO4	57
CO5	57

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	77	57	65
CO2	75	57	64.2
CO3	76	57	64.6
CO4	75	57	65
CO5	75	57	65

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	65
CO2	65
CO3	64
CO4	64
CO5	64



CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	65	65	0
CO2	64.2	65	0.8
CO3	64.6	64	-0.6
CO4	65	64	-1
CO5	65	64	-1

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	65	0		67
CO2	65	0.8	Tutorial Class Previous year QP Solve	
CO3	64	-0.6		65
CO4	64	-1		65
CO5	64	-1		65



CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PO3 PSO1 PSO2	10
CO2	PO3 PSO1 PSO2	10
CO3	PO1 PO3 PSO1 PSO2	10
CO4	PO3 PO4 PSO1 PSO2	6
CO5	PO1 PO3 PSO1 PSO2	6
		42



Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 OF 42 (100%)SESSIONS ARE DEVOTED TO PO1	2
42 OF 42(43%) SESSIONS ARE DEVOTED TO PO3	3
46 OF 46(100%) SESSIONS ARE DEVOTED TO PSO1	3
46 OF 46(100%) SESSIONS ARE DEVOTED TO PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
FOC	2		3										3	3			

CO Attainment and POs/PSOs

CO	POs /PSOs	CO Attainment (%ge)
CO1	PO1, PSO1, PSO2	65
CO2	PO3,PSO1,PSO2	64.2
CO3	PO1, PSO1, PSO2	64.6
CO4	PO3, PSO1,PSO2	65
CO5	PO1, PSO1, PSO2	65



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	42.9
PO3	64.8
PSO1	64.8
PSO2	64.8

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
FOC	2		3										3	3			
Attainment	.43		.64										.64	.64			

Course: MATHEMATICAL FOUNDATION**Credits: 4**

	At the end of this course, students will be able to
CO1	Understand concept of sets, relations and functions and mathematical logic.
CO2	Implement linear matrices and to solve linear equations
CO3	Determine permutation and combination problems
CO4	Interpret groups, subgroups, vectors and their applications
CO5	Categorize and solve two-dimensional geometry and problem solving.

**Attainment of Outcomes
 Computation of CO Attainment**

Course: Mathematical Foundation

Credits: 4

CO	Course Outcome	Knowledge category (<i>Factual/ Conceptual/ Procedural/ Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	To Understand concept of sets, relations and functions and mathematical logic.	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	10	PO1 PSO1 PSO2
CO2	To Implement linear matrices and to solve linear equations	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	10	PO4 PSO1 PSO2
CO3	To Determine permutation and combination problems	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	10	PO1 PSO1 PSO2
CO4	To Interpret groups, subgroups, vectors and their applications	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	10	PO4 PSO1 PSO2
CO5	To Categorize and solve two-dimensional geometry and problem solving.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	6	PO1 PSO1 PSO2



CO Attainment Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	2		5	
CO2	2		5	
CO3	2	5		3
CO4	2	5		5
CO5	2			2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2		3.8/5		76
CO2	1.5/2		3.7/5		75
CO3	1.5/2	3.8/5		2.2/3	76
CO4	1.5/2	3.7/5		3.7/5	75
CO5	1.5/2			1.5/2	77

Attainment of COs from SEE

CO	Class Average in SEE
CO1	56
CO2	56
CO3	56
CO4	56
CO5	56

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	76	56	64
CO2	75	56	64
CO3	76	56	64
CO4	75	56	65
CO5	77	56	65

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	65
CO2	65
CO3	64
CO4	64
CO5	64



CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	64	65	1
CO2	64	65	1
CO3	64	64	0
CO4	65	64	-1
CO5	65	64	-1

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	65	1	More assignment to be given	
CO2	65	1	Tutorial Class+Previous year QP Solve	
CO3	64	0		65
CO4	64	-1		65
CO5	64	-1		65

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PSO1,PSO2	10
CO2	PO3,PSO1, PSO2	10
CO3	PO1,PSO1,PSO2	10
CO4	PO3,PSO1,PSO2	6
CO5	PO1, PSO1, PSO2	6
		42



Course – PO/PSO Mapping Strength(NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%)SESSIONS ARE DEVOTED TO PO1	3
20 OF 46(43%) PO3	2
46 OF 46(100%) PSO1	3
46 OF 46(100%) PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Maths	3		2										3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PSO1,PSO2	64
CO2	PO3,PSO1,PSO2	64
CO3	PO1,PSO1,PSO2	64
CO4	PO3, PSO1, PSO2	65
CO5	PO1, PSO1, PSO2	65



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	64.33
PO2	42.57
PSO1	64.4
PSO2	64.4

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
TOC	3		3										3	3			
Attainment	.65		.43										.64	.65			

Course: DATASTRUCTURE USING C**Credits: 4**

	At The End Of This Course, Students Will Be Able To
CO1	Understand basic data structures such as arrays, strings, and linked lists.
CO2	Study linear data structures such as stacks and queues and understand their difference.
CO3	Describe the hash function and concepts of collision and its resolution methods.
CO4	Understand the concept of memory management.
CO5	Study different techniques for solving problems like sorting and searching

Attainment of Outcomes Computation of CO Attainment

Course: Data Structures Using C

Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand basic data structures such as arrays, strings, and linked lists.	Conceptual	Understand	8	PO1 PSO1 PSO2
CO2	Study linear data structures such as stacks and queues and understand their difference.	Procedural	Understand and apply	10	PO1 PSO2 PSO3
CO3	Describe the hash function and concepts of collision and its resolution methods.	Conceptual Procedural	Evaluate and analyse	8	PO1 PSO1 PSO2
CO4	Understand the concept of memory management.	Conceptual Procedural	Understand and apply	8	PO1 PSO1 PSO2 PSO3
CO5	Study different techniques for solving problems like sorting and searching	Conceptual Procedural	Understand and apply	8	PO1 PSO1 PSO2 PSO3



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	A2 (10)	T1 (10)	T2 (10)
CO1	2	0	5	0
CO2	3	0	5	0
CO3	1	4	0	3
CO4	2	4	0	4
CO5	2	2	0	3

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	A2 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.6	0	4.1	0	83
CO2	2.46	0	4.1	0	82
CO3	0.81	3.24	0	2.4	81
CO4	1.6	3.2	0	3.2	80
CO5	1.58	1.58	0	2.3	79

Attainment of COs from SEE

CO	Class Average in SEE
CO1	84
CO2	84
CO3	84
CO4	84
CO5	84

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	83	84	83.6
CO2	82	84	83.2
CO3	81	84	82.8
CO4	80	84	82.4
CO5	79	84	82

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	83
CO2	82
CO3	81
CO4	80
CO5	79



CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	83.6	83	-0.6
CO2	83.2	82	-1.2
CO3	82.8	81	-1.8
CO4	82.4	80	-2.4
CO5	82	79	-3

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	83	-0.6		85
CO2	82	-1.2		78
CO3	81	-1.8		76
CO4	80	-2.4		76
CO5	79	-3		77



CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1 PSO2	8
CO2	PO1 PSO2 PSO3	10
CO3	PO1 PSO1 PSO2	8
CO4	PO1 PSO1 PSO2 PSO3	8
CO5	PO1 PSO1 PSO2 PSO3	8
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 OF 42 (100%) SESSIONS ARE DEVOTED TO PO1	3
32 OF 42(100%) SESSION ARE DEVOTED TO PSO1	2
42 OF 42 (100%) SESSIONS ARE DEVOTED TO PSO2	3
26 OF 42 (100%) SESSION ARE DEVOTED TO PSO3	2



Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
DS	3	-	-	-	-	-	-	-	-	-	-	-	2	3	2	-	-

CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment (%ge)
CO1	PO1 PSO1 PSO2	83.6
CO2	PO1 PSO2 PSO3	83.2
CO3	PO1 PSO1 PSO2	82.8
CO4	PO1 PSO1 PSO2 PSO3	82.4
CO5	PO1 PSO1 PSO2 PSO3	82

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	82.8
PSO1	54.9
PSO2	82.8
PSO4	51.5

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
DS	3	-	-	-	-	-	-	-	-	-	-	-	2	3	2	-	-
Attainment	.82	-	-	-	-	-	-	-	-	-	-	-	.5	.82	.51	-	-

Course: JAVA PROGRAMMING**Credits: 4**

	At the end of this course, students will be able to
CO1	Understand the concepts related to Java Technology
CO2	Explore and understand use of Java Server Programming.
CO3	Identify the procedures and exploring the programming concepts of oops
CO4	learn skills to develop real time applications
CO5	Develop advanced skills for programming in Java

**Attainment of Outcomes
 Computation of CO Attainment**

Course: OOPS with Java

Credits: 4

CO	Course Outcome	Knowledge category(<i>Factual/Conceptual/Procedural/Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the concepts related to Java Technology	Conceptual	Understand & Remember	6	PO1 PO4 PSO1
CO2	Explore and understand use of Java Server Programming.	Conceptual and Procedural	Apply & Understand	6	PO1 PSO1 PSO3
CO3	Identify the procedures and exploring the programming concepts of oops	Factual & conceptual	Recognize	8	PO1 PSO2
CO4	Learn skills to develop real time applications	Factual/Procedural	Analyse	10	PO1 PO4 PSO2 PSO3
CO5	Develop advanced skills for programming in Java	Factual/Procedural	Construct	6	PO1 PO4 PSO2
CO6	Able to develop multithreaded applications with synchronization	Factual & conceptual	Build	6	PO1 PO4 PSO3



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	1	0	5	1
CO2	1	0	5	1
CO3	2	3	0	2
CO4	2	3	0	3
CO5	2	2	0	2
CO6	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	0.85/1	/0	4.25/5	0.85/1	85
CO2	0.84/1	/0	4.2/5	0.84/1	84
CO3	1.6/2	2.4/3	0	1.6/2	80
CO4	1.58/2	2.37/3	0	2.37/3	79
CO5	1.64/2	1.64/2	0	1.64/2	82
CO6	1.56/2	1.56/2	0	0.78/1	78



Attainment of COs from SEE

CO	Class Average in SEE
CO1	60
CO2	60
CO3	60
CO4	60
CO5	60
CO6	60

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 \times \text{CIE Cl. Ave}$ $+ 0.6 \times \text{SEE Cl. Ave}$
CO1	85	60	70
CO2	84	60	69.6
CO3	80	60	68
CO4	79	60	67.6
CO5	82	60	68.8
CO6	78	60	67.2



Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	70
CO2	69
CO3	68
CO4	67
CO5	69
CO6	68

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	70	70	0
CO2	69.6	69	-0.6
CO3	68	68	0
CO4	67.6	67	-0.6
CO5	68.8	69	0.2
CO6	67.2	68	0.8



Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	70	0		80
CO2	69	-0.6		75
CO3	68	0		72
CO4	67	-0.6		75
CO5	69	0.2	More Assignments to be given Tutorial Classes	
CO6	68	0.8	Tutorial Classes Previous Year question papers to be solved	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO4, PSO1	6
CO2	PO1,PSO1,PSO3	6
CO3	PO1,PSO2	8
CO4	PO1, PO4 ,PSO2,PSO3	10
CO5	PO1, PO4, PSO2	6
CO6	PO1, PO4, PSO3	6
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 of 42 (100%) Session devoted for PO1	Mapping Strength is 3
28 of 42 (66%) Session devoted for PO4	Mapping Strength is 2
12 of 42 (28%) Session devoted for PSO1	Mapping Strength is 1
24 of 42 (57%) Session devoted for PSO2	Mapping Strength is 2
22 of 42 (52%) Session devoted for PSO3	Mapping Strength is 2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OOPS with Java	3	-	-	2	-	-	-	-	-	-	-	-	1	2	2	-	-

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO4, PSO1	70
CO2	PO1, PSO1,PSO3	69.6
CO3	PO1,PSO2	68
CO4	PO1,PO4 ,PSO2,PSO3	67.6
CO5	PO1,PO4,PSO2	68.8
CO6	PO1,PO4,PSO3	67.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(3/3) * (70 + 69.6 + 68 + 67.6 + 68.8 + 67.2) / 6 = 68.53$
PO4	$(2/3) * (70 + 67.6 + 68.8 + 67.2) / 4 = 62.56$
PSO1	$(1/3) * (70 + 69.6) / 2 = 46.46$
PSO2	$(2/3) * (68 + 67.2 + 68.8) / 3 = 60.44$
PSO3	$(2/3) * (69.6 + 67.6 + 67.2) / 3 = 60.4$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OOPS with Java	3			2									1	2	2		
Attainment	.68			.62									.46	.60	.60		

Course: DISCRETE MATHEMATICS**Credits: 4**

	At the end of this course, students will be able to
CO1	Ability to apply mathematical logic to solve problems
CO2	Understand sets, relations, functions and discrete structures.
CO3	Solve and use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions
CO4	List and formulate problems to solve recurrence relations
CO5	Discuss model and solve real world problems using graphs and trees.

Attainment of Outcomes Computation of CO Attainment

Course: Mathematical Structure

Credits: 4

CO	Course Outcome	Knowledge category (<i>Factual/ Conceptual/ Procedural/ Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	Ability to apply mathematical logic to solve problems	<i>Factual/ Conceptual/ Procedural</i>	Understand and evaluate	10	PO1 PSO1 PSO2
CO2	Understand sets, relations, functions and discrete structures.	<i>Factual/ Conceptual/ Procedural</i>	Evaluate and Apply	10	PO4 PSO1 PSO2
CO3	Solve and use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions	<i>Factual/ Conceptual/ Procedural</i>	Understand and Solve	10	PO1 PSO1 PSO2
CO4	List and formulate problems to solve recurrence relations	<i>Factual/ Conceptual/ Procedural</i>	Apply and Implement	10	PO4 PSO1 PSO2
CO5	Discuss model and solve real world problems using graphs and trees.	<i>Factual/ Conceptual/ Procedural</i>	Analyse and Apply	6	PO1 PSO1 PSO2

CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	2		5	
CO2	2		5	
CO3	2	5		3
CO4	2	5		5
CO5	2			2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2		3.8/5		76
CO2	1.5/2		3.7/5		75
CO3	1.5/2	3.8/5		2.2/3	76
CO4	1.5/2	3.7/5		3.7/5	75
CO5	1.5/2			1.5/2	77

Attainment of COs from SEE

CO	Class Average in SEE
CO1	49
CO2	49
CO3	49
CO4	49
CO5	49

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	76	49	60
CO2	75	49	59.4
CO3	76	49	60
CO4	75	49	59.4
CO5	77	49	60.2

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	60
CO2	60
CO3	60
CO4	60
CO5	60

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	60	60	0
CO2	59.4	60	-0.6
CO3	60	60	0
CO4	59.4	60	-0.6
CO5	60.2	60	-0.8

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	65	0		66
CO2	65	-0.6		64
CO3	64	0		65
CO4	64	-0.6		65
CO5	64	-0.8		65

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1 PSO2	10
CO2	PO2 PSO1 PSO2	10
CO3	PO1 PSO1 PSO2	10
CO4	PO2 PSO1 PSO2	6
CO5	PO1 PSO1 PSO2	6
		42

Course – PO/PSO Mapping Strength (NOTE MAPPING STRENGTH CAN BE 1 2 3)

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
60 OF 60 (100%) SESSIONS ARE DEVOTED TO PO1	3
20 OF 46(43%) PO3	2
46 OF 46(100%) PSO1	3
46 OF 46(100%) PSO2	3

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Mathematical Structure	3		2										3	3			

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1 PSO1 PSO2	60
CO2	PO2/PSO1/PSO2	59.4
CO3	PO1 PSO1 PSO2	60
CO4	PO2 PSO1 PSO2	59.4
CO5	PO1 PSO1 PSO2	60.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	60.06
PO2	40
PSO1	60
PSO2	60

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Mathematical Structure	3	2											3	3			
Attainment	0.60	.40											.60	.60			

Course: C# and DOT NET**Credits: 4**

	At the end of this course, students will be able to
C01	Understand the basics of C# concepts for programming
C02	Learn Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
C03	Identify the procedures and exploring the programming concepts of C#.
C04	Understand the concept of .Net Framework and tools.
C05	Connection with ADO object in C#.



Attainment of Outcomes Computation of CO Attainment

Course: C# and Dot Net

Credits: 4

CO	Course Outcome	Knowledge category (<i>Factual/Conceptual/ Procedural/ Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the basics of C# concepts for programming	Conceptual	Understand	8	PO1,PSO1
CO2	Learn Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.	Procedural	Discuss	8	PO1,PO4,PSO2
CO3	Identify the procedures and exploring the programming concepts of C#.	Conceptual	Apply	8	PO1, PSO1, PSO2
CO4	Understand the concept of .Net Framework and tools.	Factual and procedural	Solve	10	PO1,PO4, PSO1,
CO5	Connection with ADO object in C#.	procedural	Execute	8	PO1, PSO1



CO Attainment Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	A2 (10)	T1 (10)	T2 (10)
CO1	2	2	5	1
CO2	2	2	5	2
CO3	2	2	0	3
CO4	2	2	0	3
CO5	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	A2 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2	1.5/2	4/5	0.8/1	75
CO2	1.5/2	1.5/2	4/5	1.5/2	74
CO3	1.4/2	1.4/2	0	2/3	72
CO4	1.4/2	1.4/2	0	2/3	71
CO5	1.4/2	1.4/2	0	0.71/1	71

Attainment of COs from SEE

CO	Class Average in SEE
CO1	46
CO2	46
CO3	46
CO4	46
CO5	46

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	75	46	57.6
CO2	74	46	57.2
CO3	72	46	56.4
CO4	71	46	56
CO5	71	46	56

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	57
CO2	56
CO3	55
CO4	57
CO5	55



CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	57.6	57	-0.6
CO2	57.2	56	-1.2
CO3	56.4	55	-1.4
CO4	56	57	1
CO5	56	55	-1

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	57	-0.6		58
CO2	56	-1.2		59
CO3	55	-1.4		57
CO4	57	1	More Assignments to be given	
CO5	55	-1		56

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PSO1	8
CO2	PO1,PO4,PSO2	8
CO3	PO1, PSO1, PSO2	8
CO4	PO1,PO4, PSO1,	10
CO5	PO1, PSO1	8
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 out of 42(100%) Session are devoted PO1	3
18 out of 42(42.8%) Session are devoted PO4	2
34 out of 42(80.9%) Session are devoted PSO1	2
16 out of 42(38%) Session are devoted PSO2	1



Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
C# and Dot Net	3	-	-	2	-	-	-	-	-	-	-	-	2	1	-	-	-

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PSO1	57.6
CO2	PO1,PO4,PSO2	57.2
CO3	PO1, PSO1, PSO2	56.4
CO4	PO1,PO4, PSO1,	56
CO5	PO1, PSO1	56

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	57
PO4	37
PSO1	35
PSO2	19

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
C# and Dot Net	3	-	-	2	-	-	-	-	-	-	-	-	2	1	-	-	-
Attainment	.57	-	-	.37	-	-	-	-	-	-	-	-	.35	.19	-	-	-

Course: COMPUTER COMMUNICATIONS AND NETWORKS**Credits: 4**

	At the end of this course, students will be able to
CO1	Explain the transmission technique of digital data between two or more computers
CO2	Understand how a computer network that allows computers to exchange data.
CO3	Apply the basics of data communication and various types of computer networks in real world applications.
CO4	Learn and Compare the different layers of protocols.
CO5	Compare the key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.



Attainment of Outcomes Computation of CO Attainment

Course: CCN

Credits: 4

CO	Course Outcome	Knowledge category (Factual/Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Explain the transmission technique of digital data between two or more computers	Conceptual	Understand	8	PO1 PO2 PSO-1 PSO-2
CO2	Understand how a computer network that allows computers to exchange data.	Factual Conceptual	Understand and apply	7	PO1 PSO1 PSO2
CO3	Apply the basics of data communication and various types of computer networks in real world applications.	Conceptual Procedural	Understand and apply	8	PO1 PSO1 PSO2 PSO3
CO4	Learn and Compare the different layers of protocols.	Conceptual Procedural	Understand	9	PO1 PO2 PSO1
CO5	Compare the key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.	Conceptual Procedural	Examine	10	PO1 PSO1 PSO2 PSO3



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	A2 (10)	T1 (10)	T2 (10)
CO1	2	0	5	0
CO2	1	2	5	0
CO3	2	0	0	4
CO4	2	3	0	4
CO5	3	5	0	2

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	A2 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5	0	3.7	0	75
CO2	0.7	1.4	3.7	0	74
CO3	1.4	0	0	2.8	72
CO4	1.4	2.1	0	2.8	71
CO5	2.1	3.5	0	1.4	71



Attainment of COs from SEE

CO	Class Average in SEE
CO1	38
CO2	38
CO3	38
CO4	38
CO5	38

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	75	38	52.8
CO2	74	38	52.4
CO3	72	38	51.6
CO4	71	38	51.2
CO5	71	38	51.2

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	52
CO2	52
CO3	52
CO4	51
CO5	51



CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	52.8	52	-0.2
CO2	52.4	52	-0.6
CO3	51.6	52	0.6
CO4	51.2	51	-0.8
CO5	51.2	51	-0.8

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	52	-0.2		54
CO2	52	-0.6		53
CO3	52	0.6	Previous year question papers to be solved Remedial classes	
CO4	51	-0.8		52
CO5	51	-0.8		52

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PO2,PSO-1, PSO-2	8
CO2	PO1,PSO1, PSO2	7
CO3	PO1,PSO1,PSO2,PSO3	8
CO4	PO1,PO2,PSO1	9
CO5	PO1,PSO1,PSO2,PSO3	10
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 OUT OF 42 (100%) SESSIONS ARE DEVOTED TO PO1	3
17 OUT OF 42(40%) SESSIONS ARE DEVOTED TO PO2	1
42 OUT OF 42 (100%) SESSIONS ARE DEVOTED TO PSO1	3
33 OUT OF 42 (78%) SESSIONS ARE DEVOTED TO PSO2	2
18 OUT OF 42 (43%) SESSIONS ARE DEVOTED TO PSO3	2



Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1											3	2	2		

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1,PO2,PSO-1,PSO-2	52.8
CO2	PO1,PSO1,PSO2	52.4
CO3	PO1,PSO1,PSO2,PSO3	51.6
CO4	PO1,PO2,PSO1	51.2
CO5	PO1,PSO1,PSO2,PSO3	51.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	52
PO2	40
PSO1	52
PSO2	45
PSO3	54



Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CCN	3	1	-	-	-	-	-	-	-	-	-	-	3	2	2	-	-
Attainment	.52	.4	-	-	-	-	-	-	-	-	-	-	.52	.45	.54	-	-

Course: DATABASE MANAGEMENT SYSTEM**Credits: 4**

	At the end of this course, students will be able to
C01	Understand the basic concepts of database management systems
C02	Identify and define database objects, enforce integrity constraints on a database using DBMS.
C03	Analyze a given database application scenario to use ER model for conceptual design of the database
C04	Formulate queries in Relational Algebra, Structured Query Language (SQL) for Database manipulation.
C05	Describe the transaction processing and concurrency control techniques.



Attainment of Outcomes Computation of CO Attainment

Course: DBMS

Credits: 4

CO	Course Outcome	Knowledge category(<i>Factual/ Conceptual/Procedural/Metacognitive</i>)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the basic concepts of database management systems	Conceptual	Understand	8	PO1,PSO1
CO2	Identify and define database objects, enforce integrity constraints on a database using DBMS.	Procedural	Discuss	8	PO1,PO4, PSO2
CO3	Analyze a given database application scenario to use ER model for conceptual design of the database	Conceptual	Apply	10	PO1, PSO1, PSO2
CO4	Formulate queries in Relational Algebra, Structured Query Language (SQL) for Database manipulation.	Factual and procedural	Solve	7	PO1,PO4, PSO1,
CO5	Describe the transaction processing and concurrency control techniques.	procedural	Execute	9	PO1, PSO1



CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	2	2	5	1
CO2	2	2	5	2
CO3	2	2	0	3
CO4	2	2	0	3
CO5	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.5/2	1.5/2	4/5	0.8/1	80
CO2	1.5/2	1.5/2	4/5	1.5/2	76
CO3	1.4/2	1.4/2	0	2/3	75
CO4	1.4/2	1.4/2	0	2/3	73
CO5	1.4/2	1.4/2	0	0.71/1	71

Attainment of COs from SEE

CO	Class Average in SEE
CO1	42
CO2	42
CO3	42
CO4	42
CO5	42

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 \times \text{CIE Cl. Ave} + 0.6 \times \text{SEE Cl. Ave}$
CO1	80	42	57.2
CO2	76	42	55.6
CO3	75	42	55.2
CO4	73	42	54.4
CO5	71	42	53.6

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	57
CO2	55
CO3	54
CO4	55
CO5	53



CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	57.2	57	-0.2
CO2	55.6	55	-0.6
CO3	55.2	54	-1.2
CO4	54.4	55	0.6
CO5	53.6	53	-0.6

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	57	-0.2		59
CO2	55	-0.6		57
CO3	54	-1.2		56
CO4	55	0.6	More Assignments to be given previous years question paper to be solved	
CO5	53	-0.6		55



CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1,PSO1	8
CO2	PO1,PO4,PSO1	8
CO3	PO1, PSO1, PSO2	10
CO4	PO1,PO4, PSO1,	7
CO5	PO1, PSO1,PO4	9
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 out of 42(100%) Session are devoted PO1	3
24 out of 42(57%) Session are devoted PO4	2
42 out of 42(100%) Session are devoted PSO1	3
18 out of 42(43%) Session are devoted PSO2	2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
DBMS	3	-	-	2	-	-	-	-	-	-	-	-	3	2	-	-	-



CO Attainment and POs/PSOs

CO	PO/PSO	CO Attainment (%Age)
CO1	PO1,PSO1	57
CO2	PO1,PO4,PSO1	55
CO3	PO1, PSO1, PSO2	54
CO4	PO1,PO4, PSO1,	55
CO5	PO1, PSO1,PO4	53

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	54.8
PO4	2.6
PSO1	54.8
PSO2	32.7

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
DBMS	3	-	-	1	-	-	-	-	-	-	-	-	2	2	-	-	-
Attainment	.54	-	-	.32	-	-	-	-	-	-	-	-	.54	.32	-	-	-

Course: COMPUTER MULTIMEDIA & ANIMATION**Credits: 4**

	At the end of this course, students will be able to
CO1	Explain the basic concepts of Programming and Multimedia. .
CO2	Understand basic elements using in web development
CO3	Discuss and develop animations using CSS
CO4	Describe and develop HTML5-SVG animation
CO5	Categorize and develop HTML5-CANVAS animations

Attainment of Outcomes Computation of CO Attainment

Course: COMPUTER MULTIMEDIA & ANIMATION

Credits: 4

CO	Course Outcome	Knowledge category <i>(Factual/ Conceptual/ Procedural/ Metacognitive)</i>	Cognitive Level	No. of hours	POs/PSOs
CO1	Explain the basic concepts of Programming and Multimedia.	Conceptual	Describe	10	PO1,PSO1
CO2	Understand basic elements using in web development	Factual /Procedural	Summarize	9	PO1, PO4, PSO1
CO3	Discuss and develop animations using CSS	Procedural/ Conceptual	Determine	8	PO1,PO4, PSO3
CO4	Describe and develop HTML5-SVG animation	Factual and procedural	Organize	8	PO1,PSO3
CO5	Categorize and develop HTML5-CANVAS animations	procedural	Implement	7	PO1,PSO3

CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	2	2	5	1
CO2	2	2	5	2
CO3	2	2	0	3
CO4	2	2	0	3
CO5	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.68/2	1.68/2	4.2/5	0.84/1	84
CO2	1.64/2	1.64/2	4.1/5	1.64/2	82
CO3	1.6/2	1.6/2	0	2.4/3	80
CO4	1.58/2	1.58/2	0	2.37/3	79
CO5	1.56/2	1.56/2	0	0.78/1	78

Attainment of COs from SEE

CO	Class Average in SEE
CO1	45
CO2	45
CO3	45
CO4	45
CO5	45

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 \times \text{CIE Cl. Ave} + 0.6 \times \text{SEE Cl. Ave}$
CO1	84	45	60.6
CO2	82	45	59.8
CO3	80	45	59
CO4	79	45	58.6
CO5	78	45	58.2

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	62
CO2	59
CO3	57
CO4	58
CO5	57

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	60.6	62	1.4
CO2	59.8	59	-0.8
CO3	59	57	2
CO4	58.6	58	-0.6
CO5	58.2	57	-1.2

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	65	1.4	More Assignments to be given previous years question paper to be solved	
CO2	59	-0.8		78
CO3	57	2	Tutorial Classes and previous years question paper to be solved	
CO4	58	-0.6		75
CO5	57	-1.2		70

CO-PO/PSO Mappings:

CO	POs/PSOs	Class Sessions
CO1	PO1,PSO1	10
CO2	PO1, PO4, PSO1	9
CO3	PO1,PO4,PSO3	8
CO4	PO1,PSO3	8
CO5	PO1,PSO3	7
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 out of 42(100%) Session are devoted PO1	Mapping Strength is 3
17 out of 42(40.47%) Session are devoted PO4	Mapping Strength is 2
19 out of 42(45.23%) Session are devoted PSO1	Mapping Strength is 2
23 out of 42(54.76%) Session are devoted PSO3	Mapping Strength is 2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CMA	3	-	-	2	-	-	-	-	-	-	-	-	2	-	2	-	-

CO Attainment and POs/PSOs

CO	PO/PSO	CO Attainment (%ge)
CO1	PO1,PSO1	60.6
CO2	PO1, PO4, PSO1	59.8
CO3	PO1,PO4,PSO3	59
CO4	PO1,PSO3	58.6
CO5	PO1,PSO3	58.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(3/3) * (60.6 + 59.8 + 59 + 58.6 + 58.2) / 5 = 59.24$
PO4	$(2/3) * (59.8 + 59) / 2 = 49.43$
PSO1	$(2/3) * (60.6 + 59.8) / 2 = 50.1$
PSO3	$(2/3) * (59 + 58.6 + 58.2) / 3 = 52.04$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
CMA	3	-	-	2	-	-	-	-	-	-	-	-	2	-	2	-	-
Attainment	.59	-	-	.49	-	-	-	-	-	-	-	-	.50	-	.52	-	-

Course: OPERATING SYSTEM CONCEPTS `**Credits: 4**

	At the end of this course, students will be able to
CO1	Understand the basic fundamentals of the operating system.
CO2	Comprehend multithreaded programming, process management, process synchronization
CO3	Learn memory management and storage management.
CO4	Recognize & Compare the performance of Scheduling Algorithms
CO5	Identify the features of I/O and File handling methods.

Attainment of Outcomes Computation of CO Attainment

Course: Operating System Concepts

Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the basic fundamentals of the operating system.	Conceptual	Summarize	8	PO1 PSO3
CO2	Comprehend multithreaded programming, process management, process synchronization	Factual Procedural	Understand	10	PO1 PSO1/PSO2
CO3	Learn memory management and storage management.	Conceptual	Examine	10	PO4 PSO2 PO1
CO4	Recognize & Compare the performance of Scheduling Algorithms	Conceptual Procedural	Discuss	8	PO2 PSO2 PO1
CO5	Identify the features of I/O and File handling methods.	Conceptual	Recognize	6	PO2 PSO2 PO4

CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (10)	T2 (10)
CO1	2	2	5	1
CO2	2	2	5	2
CO3	2	2	0	3
CO4	2	2	0	3
CO5	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.72	1.72	4.3	0.86	86
CO2	1.66	1.66	4.15	1.66	83
CO3	1.62	1.62	0	2.43	81
CO4	1.62	1.62	0	2.43	81
CO5	1.68	1.68	0	0.84	84

Attainment of COs from SEE

CO	Class Average in SEE
CO1	59
CO2	59
CO3	59
CO4	59
CO5	59

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	86	59	69.8
CO2	83	59	68.6
CO3	81	59	67.8
CO4	81	59	67.8
CO5	84	59	69

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	69
CO2	67
CO3	67
CO4	67
CO5	68

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	69.8	69	-0.8
CO2	68.6	67	-1.6
CO3	67.8	67	-0.8
CO4	67.8	67	-0.8
CO5	67	68	1

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	69	-0.8	Previous Year question papers to be solved	
CO2	67	-1.6		70
CO3	67	-0.8		70
CO4	67	-0.8	More Assignments to be given	
CO5	68	1	Tutorial Classes	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO3	8
CO2	PO1 PSO1/PSO2	10
CO3	PO4 PSO2 PO1	10
CO4	PO2 PSO2 PO1	8
CO5	PO2 PSO2 PO4	6
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 out of 42 (85.71) Session are devoted to PO1	Mapping Strength is 3
14 out of 42 (33.33) Session are devoted to PO2	Mapping Strength is 1
16 out of 42 (38.09) Session are devoted to PO4	Mapping Strength is 1
10 out of 42 (23.80) Session are devoted to PSO1	Mapping Strength is 1
34 out of 42 (80.95) Session are devoted to PSO2	Mapping Strength is 3
8 out of 42 (19.04) Session are devoted to PSO3	Mapping Strength is 1

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OSC	3	1		1									1	3	1		

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PO1 PSO3	69.8
CO2	PO1/PSO1/PSO2	68.6
CO3	PO4/PSO2/PO1	67.8
CO4	PO2 PSO2 PO1	67.8
CO5	PO2 PSO2 PO4	69

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(3/3) * (69.8 + 68.6 + 67.8 + 67.8) / 4 = 68.5$
PO2	$(1/3) * (67.8 + 69) / 2 = 22.8$
PO4	$(1/3) * (67.8 + 69) / 2 = 22.6$
PSO1	$(1/3) * (68.6) / 1 = 22.86$
PSO2	$(3/3) * (67.8 + 67.8 + 69 + 68.6) / 4 = 68.3$
PSO3	$(1/3) * (69.8) / 1 = 23.26$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
OSC	2	1		1									1	1	1		
Attainment	.68	.22		.22									.22	.68	.23		

Course: PYTHON PROGRAMMING `**Credits: 4**

	At the end of this course, students will be able to
CO1	Understand the basic concepts of Python Programming.
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.
CO3	Discover the commonly used operations involving file handling.
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Develop the emerging applications of relevant fields using Python.

Attainment of Outcomes Computation of CO Attainment

Course: Python Programming

Credits: 4

CO	Course Outcome	Knowledge category (Factual/ Conceptual/ Procedural/ Metacognitive)	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the basic concepts of Python Programming.	Conceptual	Report	8	PO1 PSO1
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.	Factual/Conceptual	Discuss	8	PO1
CO3	Discover the commonly used operations involving file handling.	Factual/Conceptual/Procedural	Determine	8	PO1 PO4 PSO1
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.	Factual/Conceptual	Evaluate	8	PO1 PSO3
CO5	Develop the emerging applications of relevant fields using Python.	Factual/Conceptual/Procedural	Build	10	PO1 PO4 PSO3

CO Attainment

Direct Attainment of COs

Assessment Plan for CIE

CO	A1 (10)	S1 (10)	T1 (20)	T2 (20)
CO1	2	2	5	1
CO2	2	2	5	2
CO3	2	2	0	3
CO4	2	2	0	3
CO5	2	2	0	1

Attainment of COs from CIE

Class average in CIE (As Calculated)

CO	A1 Cl. Ave (10)	S1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.68/2	1.68/2	3.36/5	0.84/1	84
CO2	1.6/2	1.6/2	4/5	1.6/2	80
CO3	1.56/2	1.56/2	0	2.34/3	78
CO4	1.6/2	1.6/2	0	2.4/3	80
CO5	1.5/2	1.5/2	0	0.75/1	75

Attainment of COs from SEE

CO	Class Average in SEE
CO1	57
CO2	57
CO3	57
CO4	57
CO5	57

Computation of CO Direct Attainment in the course:

CO	CIE Cl. Ave	SEE Cl. Ave	Direct CO Attainment $0.4 * \text{CIE Cl. Ave}$ $+0.6 * \text{SEE Cl. Ave}$
CO1	84	57	67.8
CO2	80	57	66.2
CO3	78	57	65.4
CO4	80	57	66.2
CO5	75	57	64.2

Targets: Targets are set for each CO of a course separately as

CO	Target (Class Average)
CO1	70
CO2	67
CO3	66
CO4	65
CO5	65

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	67.8	70	2.2
CO2	66.2	67	0.8
CO3	65.4	66	0.6
CO4	66.2	65	-1.2
CO5	64.2	65	0.8

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	70	2.2	More assignments to be given Previous year Question Papers to be solved	
CO2	67	0.8	More assignments to be given Previous year Question Papers to be solved	
CO3	66	0.6	Tutorial Classes Previous year Question Papers to be solved	
CO4	65	-1.2		67
CO5	65	0.8	Previous year Question Papers to be solved	

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PO1 PSO1	8
CO2	PO1	8
CO3	PO1 PO4 PSO1	8
CO4	PO1 PSO3	8
CO5	PO1 PO4 PSO3	10
		42

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
42 out of 42 (100%) Session are devoted to PO1	Mapping Strength is 3
18 out of 42 (42.8%) Session are devoted to PO4	Mapping Strength is 2
16 out of 42 (38.09%) Session are devoted to PSO1	Mapping Strength is 1
18 out of 42 (42.8%) Session are devoted to PSO3	Mapping Strength is 2

Course-POs/PSO Mapping

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Python	3	-	-	2	-	-	-	-	-	-	-	-	1	-	2	-	-

CO Attainment and POs/PSOs

CO	POs /PSOs	CO Attainment (%ge)
CO1	PO1 PSO1	67.8
CO2	PO1	66.2
CO3	PO1 PO4 PSO1	65.4
CO4	PO1 PSO3	66.2
CO5	PO1 PO4 PSO3	64.2

PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant COs) x Scale Factor

Scale Factor = (Actual Mapping Strength / Maximum Possible Mapping Strength)

= Actual Mapping Strength / 3

PO/PSO	Attainment (%)
PO1	$(3/3) * (67.8 + 66.2 + 65.4 + 66.2 + 64.2) / 5 = 65.96$
PO4	$(2/3) * (65.4 + 64.2) / 2 = 53.9$
PSO1	$(1/3) * (67.8 + 65.4) / 2 = 44$
PSO3	$(2/3) * (66.2 + 64.2) / 2 = 54.16$

Attainment of POs and PSOs

Course	POs												PSOs				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Python	3			2									1		2		
Attainment	.65			.53									.44		.54		