



DEPARTMENT OF COMPUTER SCIENCE

BCA COURSE ATTAINMENT

I SEM BCA

Course: Problem Solving Techniques Using C

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understanding of the fundamental principles behind designing algorithms and analyzing their performance, including the use of asymptotic notations to describe their efficiency.	Factual	Understand and remember	6	PSO1
CO2	Develop effective algorithms to address specific problems efficiently.	Conceptual and procedural	Understand and Apply	6	PSO1, PSO3
CO3	Understand the fundamental components and control flow mechanisms in C programming, and utilize this knowledge to solve various problems effectively.	Conceptual and procedural	Understand, apply and analyse	12	PO1, PSO1, PSO2, PSO3
CO4	Create C programs that incorporate functions, arrays, and pointers, and then compile, debug, and execute these programs.	Procedural and Factual	Understand and Apply	12	PO1, PSO1, PSO2, PSO3
CO5	Grasp different methods for searching, sorting, and manipulating text.	Conceptual	Evaluate and apply	12	PO1, PSO1, PSO3



CO Attainment				
Direct Attainment of Cos				
Assessment Plan of CIE				
	A1	T1	T2	PF
CO	10	10	10	10
CO1	1	4	2	2
CO2	1	4	2	2
CO3	3	2	3	2
CO4	3	0	3	2
CO5	2	0	0	2

**Attainment of Cos
from CIE**

Class Average in CIE(As Calculated)

CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.91	3.64	1.82	1.82	91
CO2	0.91	3.64	1.82	1.82	89
CO3	2.73	1.82	2.73	1.82	87
CO4	2.73	0	2.73	1.82	90
CO5	1.82	0	0	1.82	90

Attainment of Cos from SEE	
CO	Class Avg in SEE
CO1	40
CO2	40
CO3	40
CO4	40
CO5	40



Computation of CO Direct Attainment in the Course:

CO	CIE	SEE	Direct CO Attainment
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$
CO1	91	40	60.4
CO2	89	40	59.6
CO3	87	40	58.8
CO4	90	40	60
CO5	90	40	60

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

CO	Target (Class Average)
CO1	62
CO2	60
CO3	58
CO4	58
CO5	58

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	60.4	62	1.6
CO2	59.6	60	0.4
CO3	58.8	58	-0.8
CO4	60	58	-2
CO5	60	58	-2



**Closure of the Quality Loop
for the Cos:**

CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	62	1.6	More Assignments to be given, Solving previous year question paper	
CO2	60	0.4	More Assignments to be given, Solving previous year question paper	
CO3	58	-0.8		60
CO4	58	-2		60
CO5	58	-2		60

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PSO1	6
CO2	PSO1,PSO3	6
CO3	PO1,PSO1,PSO2,PSO3	12
CO4	PO1,PSO1,PSO2,PSO3	12
CO5	PO1,PSO1,PSO3	12
		48



Course - PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 48 (75%) Sessions are devoted to PO1	Mapping Strength is 2
48 OF 48 (100%) Sessions are devoted to PSO1	Mapping Strength is 3
24 OF 48 (50%) Sessions are devoted to PSO2	Mapping Strength is 1
42 OF 48 (87.5%) Sessions are devoted to PSO3	Mapping Strength is 2

CO-PO/PSO Mappings

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
PST	2							3	1	2		



CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO1	60.4
CO2	PSO1,PSO3	59.6
CO3	PO1,PSO1,PSO2,PSO3	58.8
CO4	PO1,PSO1,PSO2,PSO3	60
CO5	PO1,PSO1,PSO3	60

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

POs/PSOs	Attainment (%)
PO1	$2/3 \times (58.8+60+60)/3=60.26$
PSO1	$3/3 \times (60.4+59.6+58.8+60+60)/5=59.7$
PSO2	$1/3 \times (58.8+60)/2=19.79$
PSO3	$2/3 \times (59.6+58.8+60+60)/4=39.73$

PO and PSO Attainment

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
PST	2							3	1	2		
Attainment	0.60							0.59	0.19	0.39		



I SEM BCA

Course: DATA STRUCTURES

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understanding of fundamental concepts in data organization and structures, encompassing elementary data organization, data structures, and their associated operations, to be proficient in implementing abstract data types and analyzing algorithms for their complexity, including timespace trade-offs.	Factual	Understand and remember	6	PSO1
CO2	Well equipped with the knowledge and skills to effectively utilize arrays for storing and managing data in various programming contexts, enhancing their ability to develop efficient algorithms and solutions.	Conceptual and procedural	Understand and Apply	6	PSO1, PSO3
CO3	Gain proficiency in defining, representation, traversal, searching, insertion, and deletion operations in singly linked lists, doubly linked lists, header linked lists, and circular linked lists, explore stacks and queue concepts.	Conceptual and procedural	Understand, apply and analyse	12	PO1, PSO1, PSO2, PSO3
CO4	Understand, analyze, and implement binary trees, AVL trees, heaps, tries, B-trees, and lexicographic search trees and eight-balanced trees like AVL trees.	Procedural and Factual	Understand and Apply	12	PO1, PSO1, PSO2, PSO3
CO5	Grasp different methods for sorting, hashing algorithms efficiently.	Conceptual	Evaluate and apply	12	PO1, PSO1, PSO3



CO Attainment				
Direct Attainment of Cos				
Assesment Plan of CIE				
	A1	T1	T2	PF
CO	10	10	10	10
CO1	1	4	2	2
CO2	1	4	2	2
CO3	3	2	3	2
CO4	3	0	3	2
CO5	2	0	0	2

Attainment of Cos from CIE
Class Average in CIE (As Calculated)

CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.88	3.52	1.76	1.76	90
CO2	0.88	3.52	1.76	1.76	89
CO3	2.64	1.76	2.64	1.76	86
CO4	2.64	0	2.64	1.76	88
CO5	1.76	0	0	1.76	88

Attainment of Cos from SEE	
CO	Class Avg in SEE
CO1	70
CO2	70
CO3	70
CO4	70
CO5	70



Computation of CO Direct Attainment in the Course:

CO	CIE	SEE	Direct CO Attainment	
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$	
CO1	90	70	78	
CO2	89	70	77.6	
CO3	86	70	76.4	
CO4	88	70	77.2	
CO5	88	70	77.2	

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

CO	Target (Class Average)
CO1	80
CO2	75
CO3	74
CO4	78
CO5	78

CO Attainment Gap			
CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	78	80	2
CO2	77.6	75	-2.6
CO3	76.4	74	-2.4
CO4	77.2	78	0.8
CO5	77.2	78	0.8



Closure of the Quality Loop for the Cos:				
CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	80	2	More Assignments to be given, Solving previous year question paper	85
CO2	75	-2.6		
CO3	74	-2.4		
CO4	78	0.8	More Assignments to be given, Solving previous year question paper	80
CO5	78	0.8	More Assignments to be given, Solving previous year question paper	80

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PSO1	6
CO2	PSO1,PSO3	6
CO3	PO1,PSO1,PSO2,PSO3	12
CO4	PO1,PSO1,PSO2,PSO3	12
CO5	PO1,PSO1,PSO3	12
		48

Course - PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 48 (75%) Sessions are devoted to PO1	Mapping Strength is 2
48 OF 48 (100%) Sessions are devoted to PSO1	Mapping Strength is 3
24 OF 48 (50%) Sessions are devoted to PSO2	Mapping Strength is 1
42 OF 48 (87.5%) Sessions are devoted to PSO3	Mapping Strength is 2



CO-PO/PSO Mappings													
Course	POs							PSOs					
	1	2	3	4	5	6	7	1	2	3	4	5	
DS	2							3	1	2			

CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO1	78
CO2	PSO1,PSO3	77.6
CO3	PO1,PSO1,PSO2,PSO3	76.4
CO4	PO1,PSO1,PSO2,PSO3	77.2
CO5	PO1,PSO1,PSO3	77.2

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

POs/PSOs	Attainment (%)
PO1	$(2/3) \times (76.4 + 77.2 + 77.2) / 3 = 51.28$
PSO1	$(3/3) \times (78 + 77.6 + 76.4 + 77.2 + 77.2) / 5 = 77.28$
PSO2	$(1/3) \times (76.4 + 77.2) / 2 = 25.6$
PSO3	$(2/3) \times (77.6 + 76.4 + 77.2 + 77.2) / 4 = 51.4$

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)



PO and PSO Attainment

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
DS	2							3	1	2		
Attainment	0.51							0.77	0.25	0.51		

I SEM BCA

Course: DISCRETE STRUCTURES

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand set theory and mathematical induction	Factual	Understand and remember	12	PSO2
CO2	Understanding counting principles and relations	Conceptual and procedural	Understand and Apply	12	PSO2,PSO5
CO3	Understand concepts of matrices and its inverse	Conceptual and procedural	Understand, apply and analyse	6	PO1, PSO2,PSO5
CO4	Implementing linear transformations and application of matrices	Procedural and Factual	Understand and Apply	6	PO1,PSO2,PSO5
CO5	Understand Concepts of graphs and trees	Conceptual	Evaluate and apply	12	PO1,PSO5



CO Attainment				
Direct Attainment of Cos				
Assesment Plan of CIE				
CO	A1	T1	T2	PF
		10	10	10
CO1	1	3	2	2
CO2	1	3	2	2
CO3	3	4	3	2
CO4	3	0	3	2
CO5	2	0	0	2

Attainment of Cos from CIE

Class Average in CIE(As Calculated)

CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.96	2.88	1.92	1.92	96
CO2	0.96	2.88	1.92	1.92	95
CO3	2.88	3.84	2.88	1.92	93
CO4	2.88	0	2.88	1.92	92
CO5	1.92	0	0	1.92	91

Attainment of Cos from SEE

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



Computation of CO Direct Attainment in the Course:

CO	CIE	SEE	Direct CO Attainment	
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$	
CO1	96	42	63.6	
CO2	95	42	63.2	
CO3	93	42	62.4	
CO4	92	42	62	
CO5	91	42	61.6	

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

CO	Target (Class Average)
CO1	65
CO2	62
CO3	62
CO4	65
CO5	60

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	63.6	65	1.4
CO2	63.2	62	-1.2
CO3	62.4	62	-0.4
CO4	62	65	3
CO5	61.6	60	-1.6



CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	65	1.4	More Assignments to be given, Solving previous year question paper	
CO2	62	-1.2		64
CO3	62	-0.4		64
CO4	65	3	More Assignments to be given, Solving previous year question paper	
CO5	60	-1.6		62

CO-PO/PSO Mappings		
CO	POs/PSOs	Class Sessions
CO1	PSO2	12
CO2	PSO2,PSO5	12
CO3	PO1, PSO2,PSO5	6
CO4	PO1,PSO2,PSO5	6
CO5	PO1,PSO5	12
		48

Closure of the Quality Loop for the Cos:

Course - PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
24 OF 48 (50%) Sessions are devoted to PO1	Mapping Strength is 1
36 OF 48 (75%) Sessions are devoted to PSO2	Mapping Strength is 2
36 OF 48 (75%) Sessions are devoted to PSO5	Mapping Strength is 2



CO-PO/PSO Mappings

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
Discrete Structures	1								2			2

CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO2	63.6
CO2	PSO2,PSO5	63.2
CO3	PO1, PSO2,PSO5	62.4
CO4	PO1,PSO2,PSO5	62
CO5	PO1,PSO5	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)

POs/PSOs	Attainment (%)
PO1	$(1/3) \times (62.4+62+61.6)/3 = 20.66$
PSO2	$(2/3) \times (63.6+63.2+62.4+62)/4 = 41.8$
PSO5	$(2/3) \times (63.2+62.4+62+61.6)/4 = 41.53$

PO and PSO Attainment

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
Discrete Structures	1								2	2		
Attainment	0.20								0.41	0.41		



II SEM BCA

Course: Object oriented programming Using Java

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the fundamental concepts in Java Programming	Factual	Understand and remember	12	PSO1
CO2	Implement the concepts of Inheritance and polymorphism.	Conceptual and procedural	Understand and Apply	12	PSO1,PSO2
CO3	Implementing GUI Programming and event handling	Conceptual and procedural	Understand, apply and analyse	6	PO1, PSO1,PSO2
CO4	Applying exception handling mechanism	Procedural and Factual	Understand and Apply	6	PO1,PSO1,PSO2
CO5	Understand Concepts of multithreading and collections in java	Conceptual	Evaluate and apply	12	PO1,PSO2

CO Attainment				
Direct Attainment of Cos				
Assessment Plan of CIE				
CO	A1	T1	T2	PF
		10	10	10
CO1	1	3	2	2
CO2	1	3	2	2
CO3	3	4	3	2
CO4	3	0	3	2



CO5	2	0	0	2
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Attainment of Cos from CIE

Class Average in CIE(As Calculated)

CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.94	2.82	1.88	1.88	94
CO2	0.92	2.76	1.84	1.84	92
CO3	2.73	3.64	2.73	1.82	91
CO4	2.73	0	2.7	1.8	90
CO5	1.8	0	0	1.8	90

Attainment of Cos from SEE

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

Computation of CO Direct Attainment in the Course

CO	CIE	SEE	Direct CO Attainment
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$
CO1	94	42	62.8
CO2	92	42	62
CO3	91	42	61.6
CO4	90	42	61.2
CO5	90	42	61.2



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

CO	Target (Class Average)
CO1	60
CO2	64
CO3	63
CO4	60
CO5	66

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	62.8	60	-2.8
CO2	62	64	2
CO3	61.6	63	1.4
CO4	61.2	60	-1.2
CO5	67.2	66	-1.2

Closure of the Quality Loop for the Cos:

CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	60	-2.8		62
CO2	64	2	More Assignments to be given, Solving previous year question paper	
CO3	63	1.4	More Assignments to be given, Solving previous year question paper	
CO4	60	-1.2		62
CO5	66	-1.2		68



CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PSO1	12
CO2	PSO1,PSO2	12
CO3	PO1, PSO1,PSO2	6
CO4	PO1,PSO1,PSO2	6
CO5	PO1,PSO2	12
		48

Course - PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
24 OF 48 (50%) Sessions are devoted to PO1	Mapping Strength is 1
36 OF 48 (75%) Sessions are devoted to PSO1	Mapping Strength is 2
36 OF 48 (75%) Sessions are devoted to PSO2	Mapping Strength is 2

CO-PO/PSO Mappings

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
Java	1							2	2			



CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO1	62.8
CO2	PSO1,PSO2	62
CO3	PO1, PSO1,PSO2	61.6
CO4	PO1,PSO1,PSO2	61.2
CO5	PO1,PSO2	67.2

POs/PSOs	Attainment (%)
PO1	$(1/3) \times (62.4+62+61.6)/3 = 20.66$
PSO2	$(2/3) \times (63.6+63.2+62.4+62)/4 = 41.8$
PSO5	$(2/3) \times (63.2+62.4+62+61.6)/4 = 41.53$

PO and PSO Attainment

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
Java	1							2	2			
Attainment	0.21							0.41	0.42			



II SEM BCA

Course: Database Management System

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the fundamentals of DBMS and Architecture	Factual	Understand and remember	12	PSO1
CO2	Understanding Data Modelling using Entity – Relationship Model	Conceptual and procedural	Understand and Apply	12	PSO3,PSO5
CO3	Understand concepts of Relational Algebra and Normalization	Conceptual and procedural	Understand, apply and analyse	6	PO1, PSO1,PSO3
CO4	Implementing SQL queries	Procedural and Factual	Understand and Apply	6	PO1,PSO3,PSO4
CO5	Understand Concepts of Transaction control techniques	Conceptual	Evaluate and apply	12	PO1,PSO3



CO Attainment				
Direct Attainment of Cos				
Assessment Plan of CIE				
CO	A1	T1	T2	PF
		10	10	10
CO1	1	3	2	2
CO2	1	3	2	2
CO3	3	4	3	2
CO4	3	0	3	2
CO5	2	0	0	2

Attainment of Cos from CIE

Class Average in CIE(As Calculated)					
CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO 1	0.86	2.58	1.72	1.72	86
CO 2	0.85	2.55	1.7	1.7	85
CO 3	2.61	3.48	2.61	1.74	87
CO 4	2.4	0	2.4	1.6	80
CO 5	1.64	0	0	1.64	82

Attainment of Cos from SEE

CO	Class Avg in SEE
CO1	65
CO2	65
CO3	65
CO4	65
CO5	65



Computation of CO Direct Attainment in the Course:

CO	CIE	SEE	Direct CO Attainment	
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$	
CO1	86	65	73.4	
CO2	85	65	73	
CO3	87	65	73.8	
CO4	80	65	71	
CO5	82	65	71.8	

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

CO	Target (Class Average)
CO1	72
CO2	75
CO3	75
CO4	69
CO5	66

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	73.4	72	-1.4
CO2	73	75	2
CO3	73.8	75	1.2
CO4	71	69	-2
CO5	71.8	70	-1.8



Closure of the Quality Loop for the Cos:

CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	72	-1.4		74
CO2	75	2	More Assignments to be given, Solving previous year question paper	
CO3	75	1.2	More Assignments to be given, Solving previous year question paper	
CO4	69	-2		71
CO5	66	-1.8		68

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PSO1	12
CO2	PSO3,PSO5	12
CO3	PO1, PSO1,PSO3	6
CO4	PO1,PSO3,PSO4	6
CO5	PO1,PSO3	12
		48

Course - PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
24 OF 48 (50%) Sessions are devoted to PO1	Mapping Strength is 1
36 OF 48 (75%) Sessions are devoted to PSO2	Mapping Strength is 2
36 OF 48 (75%) Sessions are devoted to PSO5	Mapping Strength is 2



CO-PO/PSO Mappings

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
Discrete Structures	1							1		2	1	1

CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO1	73.4
CO2	PSO3,PSO5	73
CO3	PO1, PSO1,PSO3	73.8
CO4	PO1,PSO3,PSO4	71
CO5	PO1,PSO3	71.8

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**

POs/PSOs	Attainment (%)
PO1	$(1/3) \times (73.8+71+71.8)/3 = 24.06$
PSO1	$(1/3) \times 73.4/1 = 49.2$
PSO3	$(2/3) \times (73+73.8+71+71.8)/4 = 48.26$



PSO4	$(1/3) \times (71/1) = 23.66$
PSO5	$(1/3) \times 73/1 = 24.33$

PO and PSO Attainment

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
DBMS	1							1		2	1	1
Attainment	0.24							0.49		0.48	0.23	0.24

II SEM BCA

Course: COMPUTER ARCHITECTURE

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the Number Systems, Conversions between different number systems and basic structure of a computer.	Conceptual and procedural	Understand and Apply	06	PSO2
CO2	Logic gates, Designing Combinational Circuits and understand instruction codes, timing and control signals.	Conceptual and procedural	Understand and Apply	06	PSO2
CO3	Understand stack organization and addressing modes in CPU organization	Conceptual and procedural	Understand, apply and analyse	12	PO1, PSO2
CO4	Understand interrupts, direct memory access in input-output organization	Procedural and Factual	Understand and Apply	06	PO1, PSO2
CO5	Understand memory organization, Multithreaded Architecture and its purpose	Conceptual	Understand and Apply	06	PO1, PSO2



CO Attainment				
Direct Attainment of Cos				
Assesment Plan of CIE				
CO	A1	T1	T2	PF
	10	10	10	10
CO1	1	4	1	2
CO2	1	4	1	2
CO3	3	2	3	2
CO4	3	0	3	2
CO5	2	0	2	2

Attainment of Cos from CIE					
Class Average in CIE(As Calculated)					
CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.86	3.44	0.86	1.72	86
CO2	0.84	3.36	0.84	1.68	84
CO3	2.46	1.64	2.46	2.46	82
CO4	2.58	0	2.58	1,72	86
CO5	1.68	0	1.68	1.68	84



Attainment of Cos from SEE	
CO	Class Avg in SEE
CO1	60
CO2	60
CO3	60
CO4	60
CO5	60

Computation of CO Direct Attainment in the Course:			
CO	CIE	SEE	Direct CO Attainment
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$
CO1	86	60	70.4
CO2	84	60	69.6
CO3	82	60	68.8
CO4	86	60	70.4
CO5	84	60	69.6

CO	Target (Class Average)
CO1	72
CO2	71
CO3	71
CO4	70
CO5	72



CO Attainment Gap			
CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	70.4	70	-0.4
CO2	69.6	71	1.4
CO3	68.8	71	2.2
CO4	70.4	70	-0.4
CO5	69.6	72	2.4

Closure of the Quality Loop for the Cos:				
CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	70	-0.4		72
CO2	71	1.4	More Assignments to be given, Solving previous year question paper	
CO3	71	2.2	More Assignments to be given, Solving previous year question paper	
CO4	70	-0.4		72
CO5	72	2.4	More Assignments to be given, Solving previous year question paper	



CO -PO/PSO Mappings		
CO	POs/PSOs	Class Sessions
CO1	PSO2	6
CO2	PSO2	6
CO3	PO1,PSO2	12
CO4	PO1,PSO2	12
CO5	PO1,PSO2	12
		48

Course - PO/PSO Mapping Strength	
Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 48 (75%) Sessions are devoted to PO1	Mapping Strength is 2
48 OF 48 (100%) Sessions are devoted to PSO2	Mapping Strength is 3



CO-PO/PSO Mappings

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
CA	2							3				

CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO2	70.4
CO2	PSO2	69.6
CO3	PO1,PSO2	68.8
CO4	PO1,PSO2	70.4
CO5	PO1,PSO2	69.6

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

POs/PSOs	Attainment (%)
PO1	$2/3 \times (68.8+70.4+69.6)/3=45.93$
PSO1	$3/3 \times (70.4+69.6+68.8+70.4+69.6)/5=69.76$



PO and PSO Attainment												
Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
CA	2							3		2	2	
Attainment	45.93							69.76				

III SEM BCA

Course: Operating System

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Comprehend the organization and operations of an Operating System as well as the fundamental concept of a process.	Factual	Understand and remember	6	PSO1
CO2	Comprehend the various algorithms used for scheduling tasks on the CPU.	Conceptual and procedural	Understand and Apply	6	PSO1, PSO4
CO3	Explain various methods utilized for managing memory in computing systems.	Conceptual and procedural	Understand, apply and analyse	12	PO1, PSO1, PSO3, PSO4
CO4	Outline diverse approaches to allocating disk space and managing free space effectively on storage devices.	Procedural and Factual	Understand and Apply	12	PO1, PSO1, PSO3, PSO4
CO5	Study real-world examples of Linux and Windows operating systems.	Conceptual	Evaluate and apply	12	PO1, PSO1, PSO3, PSO4



CO Attainment				
Direct Attainment of C os				
Assesment Plan of CIE				
CO	A1	T1	T2	PF
	10	10	10	10
CO1	1	4	1	2
CO2	1	4	1	2
CO3	3	2	3	2
CO4	3	0	3	2
CO5	2	0	2	2

Attainment of Cos from CIE

Class Average in CIE(As Calculated)

CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.85	3.4	0.85	1.7	83
CO2	0.85	3.4	0.85	1.7	85
CO3	2.55	1.7	2.55	1.7	87
CO4	2.55	0	2.55	1.7	85
CO5	1.7	0	1.7	1.7	83

Attainment of Cos from SEE

CO	Class Avg in SEE
CO1	70
CO2	70
CO3	70
CO4	70
CO5	70

Computation of CO Direct Attainment in the Course:

CO	CIE	SEE	Direct CO Attainment
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$
CO1	83	70	75.2
CO2	85	70	76
CO3	87	70	76.8
CO4	85	70	76
CO5	83	70	75.2



Targets: Targets are set for each CO of :

CO	Target (Class Average)
CO1	77
CO2	77
CO3	73
CO4	75
CO5	75

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	75.2	77	1.8
CO2	76	77	1
CO3	76.8	73	-3.8
CO4	76	75	-1
CO5	75.2	75	-0.2

Closure of the Quality Loop for the Cos:

CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	77	1.8	More Assignments to be given, Solving previous year question paper	
CO2	77	1	More Assignments to be given, Solving previous year question paper	
CO3	73	-3.8		76
CO4	75	-1		78
CO5	75	-0.2		78

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PSO1	6
CO2	PSO1,PSO4	6
CO3	PO1,PSO1,PSO3,PSO4,	12
CO4	PO1,PSO1,PSO3,PSO4,	12
CO5	PO1,PSO1,PSO3,PSO4,	12
		48



Course - PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 48 (75%) Sessions are devoted to PO1	Mapping Strength is 2
48 OF 48 (100%) Sessions are devoted to PSO1	Mapping Strength is 3
36 OF 48 (75%) Sessions are devoted to PSO3	Mapping Strength is 2
42 OF 48 (87.5%) Sessions are devoted to PSO4	Mapping Strength is 2

CO-PO/PSO Mappings

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
OS	2							3		2	2	

CO Attainment and POs/PSOs

CO	POs/PSOs	CO Attainment(%)
CO1	PSO1	75.2
CO2	PSO1,PSO4	76
CO3	PO1,PSO1,PSO3,PSO4,	76.8
CO4	PO1,PSO1,PSO3,PSO4,	76
CO5	PO1,PSO1,PSO3,PSO4,	75.2



PO and PSO Attainment

Attainment of PO/PSO = (Average of attainments of relevant

Scale Factor = (Actual Mapping Strength / Maximum Possible

Actual Mapping Strength/3

POs/PSOs	Attainment (%)
PO1	$2/3 \times (76.8+76+75.2)/3=50.66$
PSO1	$3/3 \times (75.2+76+76.8+76+75.2)/5=75.84$
PSO3	$2/3 \times (76.8+76+75.2)/3=50.66$
PSO4	$2/3 \times (76+76.8+76+75.2)/4=50.6$

PO and PSO Attainment

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
OS	2							3		2	2	
Attainment	0.50							0.75		0.50	0.50	



III SEM BCA

Course: COMPUTER NETWORKS

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand basic concepts of networks, network hardware and network software and describe various standard network models.	Conceptual and procedural	Understand and Apply	06	PSO1
CO2	Understand data communication, various transmission media and familiarize with modulation, multiplexing and switching.	Conceptual and procedural	Understand and Apply	06	PSO2,PSO4
CO3	Analyze error detection and correction, data link protocols, understand the role of medium access control sub layer	Conceptual and procedural	Understand, apply and analyse	12	PO1,PSO1,PS03,PSO4
CO4	Implement and analyze routing and congestion issues in network design	Procedural and Factual	Understand and Apply	06	PO1,PSO1,PS03,PSO4
CO5	Familiarize with network security, DNS, email and QoS	Conceptual	Understand and Apply	06	PO1,PSO1,PS03,PSO5



CO Attainment				
Direct Attainment of Cos				
Assesment Plan of CIE				
CO	A1	T1	T2	PF
		10	10	10
CO1	1	4	1	2
CO2	1	4	1	2
CO3	3	2	3	2
CO4	3	0	3	2
CO5	2	0	2	2

Attainment of Cos from CIE					
Class Average in CIE(As Calculated)					
CO	A1	T1	T2	PF	CIE Class Average(%)
	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	CL.Avg(10)	
CO1	0.82	3.28	0.82	1.64	82
CO2	0.8	3.2	0.8	1.6	80
CO3	2.37	1.58	2.37	1.58	79
CO4	2.4	0	2.4	1.6	80
CO5	1.6	0	1.6	1.6	80

Attainment of Cos from SEE	
CO	Class Avg in SEE
CO1	77
CO2	77
CO3	77
CO4	77
CO5	77

**Computation of CO Direct Attainment in the Course:**

CO	CIE	SEE	Direct CO Attainment	
	CL. Avg	CL.Avg	$0.4 * \text{CIE L.Avg} + 0.6 * \text{SEE CL.Avg}$	
CO1	82	77	79	
CO2	80	77	78.2	
CO3	79	77	77.8	
CO4	80	77	78.2	
CO5	80	77	78.2	

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

CO	Target (Class Average)
CO1	79
CO2	79
CO3	78
CO4	78
CO5	78

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO Attainment Gap
			CA-COA
CO1	79	79	0
CO2	78.2	79	0.8
CO3	77.8	78	0.2
CO4	78.2	78	-0.2
CO5	78.2	78	-0.2



Closure of the Quality Loop for the Cos:

CO	Target	CO Attainment Gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	79	0		82
CO2	79	0.8	More Assignments to be given, Solving previous year question paper	
CO3	78	0.2	Remedial Classes, More Assignments to be given, Solving previous year question paper	
CO4	78	-0.2		80
CO5	78	-0.2		80

CO-PO/PSO Mappings

CO	POs/PSOs	Class Sessions
CO1	PSO1	6
CO2	PSO2,PSO4	6
CO3	PO1,PSO1,PSO3,PSO4,	12
CO4	PO1,PSO1,PSO3,PSO4,	12
CO5	PO1,PSO1,PSO3,PSO5	12
		48



Course - PO/PSO Mapping Strength	
Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 48 (75%) Sessions are devoted to PO1	Mapping Strength is 2
48 OF 48 (100%) Sessions are devoted to PSO1	Mapping Strength is 3
36 OF 48 (75%) Sessions are devoted to PSO3	Mapping Strength is 2
30 OF 48 (62.5%) Sessions are devoted to PSO4	Mapping Strength is 2
12 OF 48 (25%) Sessions are devoted to PSO5	Mapping Strength is 1

CO-PO/PSO Mappings												
Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
CN	2							3		2	2	1



CO Attainment and POs/PSOs		
CO	POs/PSOs	CO Attainment(%)
CO1	PSO1	79
CO2	PSO1,PSO4	78.2
CO3	PO1,PSO1,PSO3,PSO4,	77.8
CO4	PO1,PSO1,PSO3,PSO4,	78.2
CO5	PO1,PSO1,PSO3,PSO5,	78.2

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	
POs/PSOs	Attainment (%)
PO1	$2/3 \times (77.8+78.2+78.2)/3=51.52$
PSO1	$3/3 \times (79+78.2+77.8+78.2+78.2)/5=78.28$
PSO3	$2/3 \times (77.8+78.2+78.2)/3=51.52$
PSO4	$2/3 \times (78.2+77.8+78.2)/3=51.52$
PSO5	$1/3 \times (78.2)/1=26.06$



PO and PSO Attainment												
Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
CN	2							3		2	2	
Attainment	0.51							0.78		0.51	0.51	0.26

III SEM BCA

Course: PYTHON PROGRAMMING

CO	Course Outcome	Knowledge category	Cognitive Level	No. of hours	POs/PSOs
CO1	Understand the fundamental concepts in Python programming	Factual	Understand and remember	06	PSO1
CO2	Implement the concepts of loops and functions.	Conceptual and procedural	Understand and Apply	06	PSO1, PSO2
CO3	Examine the efficiency of various methods in the functionality of lists, tuples, dictionaries and sets.	Conceptual and procedural	Understand, apply and analyse	12	PO1, PSO1, PSO2
CO4	Apply appropriate file handling techniques.	Procedural and Factual	Understand and Apply	06	PO1, PSO1, PSO2
CO5	Evaluate the usage of OOP in Python for designing modular and reusable code	Conceptual	Evaluate and apply	06	PO1, PSO2, PSO3
CO6	Assessing the efficiency of Python libraries and modules and designing novel applications	Conceptual	Evaluate and Create	12	PO1, PSO1, PSO2, PSO3



CO Attainment				
Direct Attainment of COs				
Assessment Plan for CIE				
CO	A1	P1	T1	T2
	10	10	10	10
CO1	2	1	2	2
CO2	2	1	2	2
CO3	2	4	2	2
CO4	2	0	0	1
CO5	2	0	2	1
CO6	0	4	2	2

Attainment of COs from CIE					
Class average in CIE (As Calculated)					
CO	A1 Cl. Ave (10)	P1 Cl. Ave (10)	T1 Cl. Ave (10)	T2 Cl. Ave (10)	CIE Class Average (%)
CO1	1.88	0.94	1.88	1.88	94
CO2	1.84	0.92	1.84	1.84	92
CO3	1.86	3.72	1.86	1.86	93
CO4	1.92	0	0	0.96	96
CO5	1.9	0	1.9	4.95	95
CO6	0	3.72	1.86	1.86	93

Attainment of COs from SEE	
CO	Class Average in SEE
CO1	66
CO2	66
CO3	66
CO4	66
CO5	66
CO6	66



Computation of CO Direct Attainment in the course:

CO	CIE	SEE	Direct CO Attainment
	Cl. Ave	Cl. Ave	$0.4 * \text{CIE Cl. Ave} + 0.6 * \text{SEE Cl. Ave}$
CO1	94	66	77.2
CO2	92	66	76.4
CO3	93	66	76.8
CO4	96	66	78
CO5	95	66	77.6
CO6	93	66	76.8

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

CO	Target (Class Average)
CO1	79
CO2	80
CO3	75
CO4	80
CO5	79
CO6	75

CO Attainment Gap

CO	CO Attainment	Target (Class Average)	CO attainment Gap CA-COA
CO1	77.2	79	1.8
CO2	76.4	80	3.6
CO3	76.8	76	-0.8
CO4	78	80	2
CO5	77.6	80	2.4
CO6	76.8	76	-0.8



CO	POs	CO Attainment (%age)
CO1	PSO1	77.2
CO2	PSO1, PSO2	76.4
CO3	PO1, PSO1, PSO2	76.8
CO4	PO1, PSO2, PSO3	78
CO5	PO1, PSO1, PSO2, PSO3	77.6
CO6	PO1, PSO1, PSO2, PSO3	76.8

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)

Closure of the Quality Loop for COs:

	Target	CO Attainment gap (%)	Action proposed to bridge the gap	Modification of target where achieved
CO1	79	1.8	More assignments to be given Presentation Previous year question papers to be solved	
CO2	80	3.6	More assignments to be given Presentation Previous year question papers to be solved	
CO3	76	-0.8		77
CO4	80	2	More assignments to be given Presentation Previous year question papers to be solved	
CO5	80	2.4	More assignments to be given Presentation Previous year question papers to be solved	
CO6	76	-0.8		77



CO-PO/PSO MAPPING

CO	POs / PSOs	Class Sessions
CO1	PSO1	06
CO2	PSO1, PSO2	06
CO3	PO1, PSO1, PSO2	12
CO4	PO1, PSO1, PSO2	06
CO5	PO1, PSO2, PSO3	06
CO6	PO1, PSO1, PSO2, PSO3	12
		48

Course – PO/PSO Mapping Strength

Percentage of Sessions devoted to each PO/PSO	Mapping Strength
36 OF 48 (75%) Sessions are devoted to PO1	Mapping Strength is 2
48 OF 48 (100%) Sessions are devoted to PSO1	Mapping Strength is 4
42 OF 48 (87.5%) Sessions are devoted to PSO2	Mapping Strength is 3
18 OF 48 (37.5%) Sessions are devoted to PSO3	Mapping Strength is 1

Course-POs/PSO Mapping

Course	POs							PSOs				
	1	2	3	4	5	6	7	1	2	3	4	5
Python	2	--	--	--	--	--	-	4	3	1	--	-

CO Attainment and POs/PSOs

CO	POs	CO Attainment (%ge)
CO1	PSO1	77.2
CO2	PSO1, PSO2	76.4
CO3	PO1, PSO1, PSO2	76.8



CO4	PO1, PSO1, PSO2	78
CO5	PO1, PSO2, PSO3	76.8
CO6	PO1, PSO1, PSO2, PSO3	77.2

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	$(2/4) \times (76.8+78+76.8+77.2)/4 = 38.6$
PSO1	$(4/4) \times (77.2+76.4+76.8+78+77.2)/5 = 77.12$
PSO2	$(3/4) \times (76.4+76.8+78+76.8+77.2)/5 = 57.78$
PSO3	$(1/4) \times (76.8+77.2)/2 = 19.25$

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	2	-	-	-	-	-	-	-	-	--	--	--	4	3	1	-	-
Attainment	.39	-	-	-	-	-	-	-	-	--	--	--	.77	.57	.19	-	-



BCA Attainment Table

Subject	PO's							PSO'S				
	1	2	3	4	5	6	7	1	2	3	4	5
PST	0.60	-	-	-	-	-	-	0.59	0.19	0.39	-	-
DS	0.51	-	-	-	-	-	-	0.77	0.25	0.51	-	-
Discrete Structure	0.20	-	-	-	-	-	-	-	0.41	0.41	-	-
Java	0.21	-	-	-	-	-	-	0.41	0.42	-	-	-
DBMS	0.24	-	-	-	-	-	-	0.49	-	0.48	0.23	0.24
Computer Architecture	0.45	-	-	-	-	-	-	0.69	-	-	-	-
Computer Networks	0.51	-	-	-	-	-	-	0.78	-	0.51	0.51	0.26
Operating System	0.50	-	-	-	-	-	-	0.75	-	0.50	0.50	-
Python Programming	0.39	-	-	-	-	-	-	0.77	0.57	0.19	-	-