DEPARTMENT OF B.SC COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: BIGDATA ANALYTICS **COURSE CODE: CS21501B** **CREDITS: 3**
DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING
Programme Outcomes – (B. Sc.) ● **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems. ● **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. ● **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. ● **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities. ● **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development. ● **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams. ● **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation. ● **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):
Students will be able to:
PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explain Bigdata Concepts and various Technologies to handle it	II (UNDERSTANDING)
CO2	**CO2:** Use Hadoop Ecosystem and MapReduce to Reduce to process Bigdata	V(EVALUATE)
CO3	**CO3:** Analyze data Processing through Map Reduce	IV (ANALYZING)
CO4	**CO4:** CHOOSEYARN for Resource Management and HIVE for Data Storage	III(APPLY)
CO5	**CO5:** Develop PHP Programs and Database Connectivity through MYSQL	VI(CREATING)

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1					H								
2			H										
3			H							H	H		
4	H			H					H				
5		H		H							H		

H: Highly Supportive

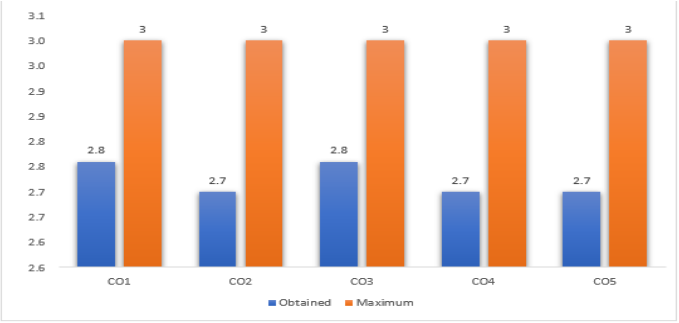
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2

Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	98.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	58.5	0.0	2.4	90.6	3.0	3.0	2.8
CO2	98.1	3.0			100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7
CO3	98.1	3.0	100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.4	90.6	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.84		H 2.84					
CO2	H 2.8		H 2.8	H 2.8			H 2.8	
CO3	H 2.84		H 2.84	H 2.84	H 2.84		H 2.84	
CO4	H 2.8		H 2.8	H 2.8			H 2.8	
CO5	H 2.8		H 2.8	H 2.8				H 2.8
AVERAGE OF COS FOR POS	2.816		2.816	2.81	2.84		2.813333333	2.8
AVERAGE OF POS	2.8112		2.8112	2.81	2.84		2.81333	2.8
AVERAGE	2.814288889							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: COMPUTER NETWORKS

COURSE CODE: BS18545

CREDITS: 4

DEPARTMENT: B. Sc. Computer Science and Engineering

Programme Outcomes – (B. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO 1	**CO1: Identify** basic computer network topologies and protocols and explain Data Communication System components	III (APPLY)

CO 2	**CO2: Classify** different error detecting techniques.	IV(ANALYZE)
CO 3	**CO3: Construct** sub-netting and routing mechanisms.	III (APPLY)
CO 4	**CO4: Sketch** the routing protocols and analyze how to assign the IP addresses for the given network	III (APPLY)
CO 5	**CO5:** Develop Network Design and Implementation	IV(ANALYZE)

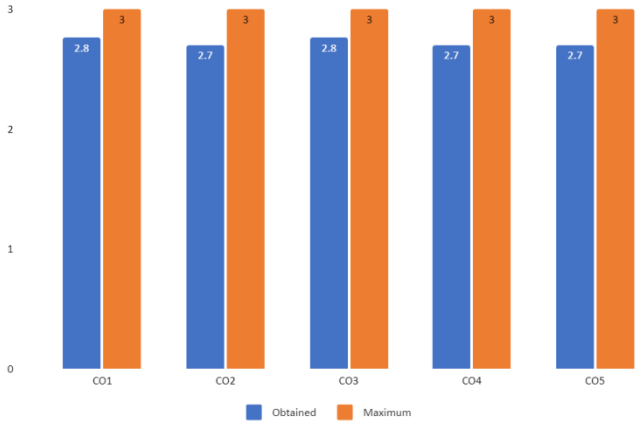
Table 1: CO, PO, PSO MAPPING

Course outcomes	**Programme Outcomes**								**Program Specific Outcomes**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**S**		**H**	**H**	**S**		**S**	**H**	**S**	**S**		**S**	
2	**S**		**S**	**H**		**S**	**S**	**S**	**H**	**H**		**H**	

3	**H**		**H**	**H**		**S**	**H**	**S**	**S**	**H**		**H**	
4	**S**		**S**	**H**		**S**	**S**	**H**		**H**	**S**	**H**	
5	**H**		**H**	**H**	**S**		**S**	**S**		**S**		**S**	

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT



ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence						
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal average	pass %	Attainment level	co wise external average	co wise total average
CO1	98.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	43.4	0.0	2.4	100.0	3.0	3.0	2.8

CO2	98.1	3.0			100.0	3.0			100.0	3.0	43.4	0.0	2.3	100.0	3.0	3.0	2.7
CO3	98.1	3.0	98.1	3.0	100.0	3.0			100.0	3.0	43.4	0.0	2.4	100.0	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	43.4	0.0	2.3	100.0	3.0	3.0	2.7
CO5			98.1	3.0	100.0	3.0			100.0	3.0	43.4	0.0	2.3	100.0	3.0	3.0	2.7
																AVERAGE	AVERAGE
																3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8	
CO1					H	2.76	H	2.76							H	2.76
CO2							H	2.7								

CO3	H	2.76			H	2.76	H	2.76					H	2.76		
CO4							H	2.7							H	2.7
CO5	H	2.7			H	2.7	H	2.7								
AVERAGE OF COS FOR POS	2.73				2.74		2.724						2.76		2.73	
AVERAGE OF POS		2.73				2.7333 33333		2.7168						2.76		2.715
AVERAGE	2.731026667															

MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

COURSE TITLE: MOBILE APPLICATION DEVELOPMENT
COURSE CODE: CS21503
CREDITS: 4

DEPARTMENT: Computer Science and Engineering

Programme Outcomes – (B.Sc)

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):
Students will be able to:
PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**Compare** different mobile application models/architectures and patterns	IV (Analyze)
CO2	**Apply** a mobile development framework to the development of a mobile application.	III (Apply)

CO3	**Explain**components and structure of a mobile development framework.	II (Understand)
CO4	**Develop** advanced Java programming competency	VI (Create)
CO5	**Develop** Mobile Application using HTTP.	VI (Create)

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
1	H		H						H	H			
2	H	H		H					H		H		
3		H		H				H	H	H			
4		H		H					H		H		
5		H						H	H	H	H		

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

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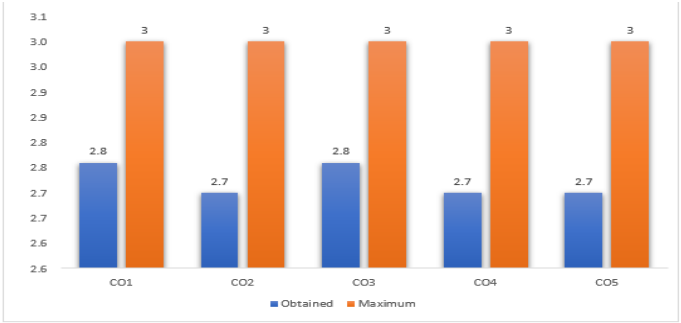

co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	98.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	58.5	0.0	2.4	90.6	3.0	3.0	2.8
CO2	98.1	3.0			100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7
CO3	98.1	3.0	100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.4	90.6	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

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OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76		H 2.76					
CO2	H 2.7	H 2.7		H 2.7				
CO3		H 2.76		H 2.76				H 2.76
CO4		H 2.7		H 2.7				
CO5		H 2.7						H 2.7
AVERAGE OF COS FOR POS	2.73	2.715	2.76	2.72				2.73
AVERAGE OF POS	2.715	2.715	2.76	2.72				2.73
AVERAGE	2.728							

COURSE TITLE: WEB TECHNOLOGIES
COURSE CODE: CS21504
CREDITS: 3

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES (BA/BSC/BCOM and BBA):
BSc.

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL): B.Sc. Computer Science Engineering

Students will be able to:

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**Illustrate** basic html scripts to design web pages	II(UNDERSTAND)
CO2	**Explain** about cascading style sheets	V(EVALUATE)

CO3	**Analyze** java script programming using operators, expressions, functions	IV(ANALYZING)
CO4	**Classify** event handling in java script and introduction to xml	IV(ANALYZE)
CO5	**Develop** PHP programs and database connectivity through mysql.	VI (CREATE)

Table 1: CO, PO, PSO MAPPING

Course outcomes	**Programme Outcomes**								**Program Specific outcomes**				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**P0 8**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	
1	**H**		**H**					**H**	**H**		**H**		
2		**H**			**H**			**H**			**H**		
3	**H**		**H**	**H**				**H**	**H**		**H**		
4			**H**	**H**				**H**	**H**		**H**		
5			**H**	**S**				**H**	**H**		**H**	**H**	

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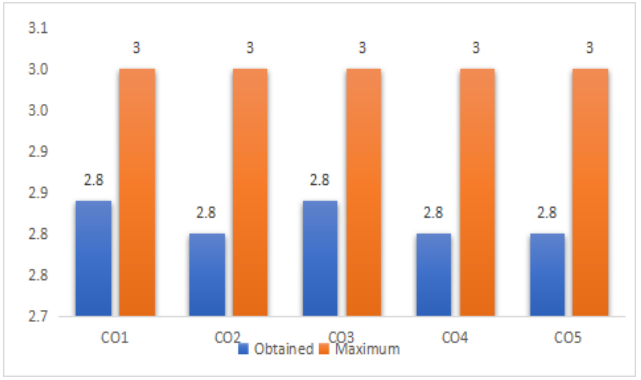

co	mid exam 1	mid exam 2	group discussion	assignment	viva	Attendence		External Exam	

	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	cowise internal average	pass%	Attainment level	cowise external average	cowise total average
CO 1	100.0	3.0			101.9	3.0	101.9	3.0	101.9	3.0	73.1	1.0	2.6	100.0	3.0	3.0	2.8
CO 2	100.0	3.0			101.9	3.0			101.9	3.0	73.1	1.0	2.5	100.0	3.0	3.0	2.8
CO 3	100.0	3.0	90.4	3.0	101.9	3.0			101.9	3.0	73.1	1.0	2.6	100.0	3.0	3.0	2.8
CO 4			90.4	3.0	101.9	3.0			101.9	3.0	73.1	1.0	2.5	100.0	3.0	3.0	2.8
CO 5			90.4	3.0	101.9	3.0			101.9	3.0	73.1	1.0	2.5	100.0	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.816

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

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CO3	H 2.84		H 2.84	H 2.84				H 2.84
CO4			H 2.8	H 2.8				H 2.8
CO5			H 2.8					H 2.8
AVERAGE OF COS FOR POS	2.84	2.8	2.82	2.82	2.8			2.816
AVERAGE OF POS	2.84	2.8	2.815	2.82	2.8			2.8112
AVERAGE	2.814366667							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: SOFTWARE TESTING AND QUALITY **COURSE CODE: BS18044A** **CREDITS: 4**
DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING
PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : **BSc.**

- **PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.**
- **PO2. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.**
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PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL

CO1	**Express** importance of testing in software development process, glass-box testing, black-box testing, and how to report and analyze bugs	II (Understand)
CO2	**Design** different types of test case	VI (Create)
CO3	**Organize** how to build testing strategy, establishing software testing methodology and software testing techniques.	VI (Create)
CO4	**Identify** the definition of quality, metrics for software quality and inspection techniques.	IV (Analyse)
CO5	**Explain** software configuration management, software reengineering and software restructuring techniques.	III (Apply)

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	**Programme Outcomes**								**Program Specific outcomes**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**H**		**H**					**H**	**H**		**H**		
2		**H**			**H**					**H**		**H**	

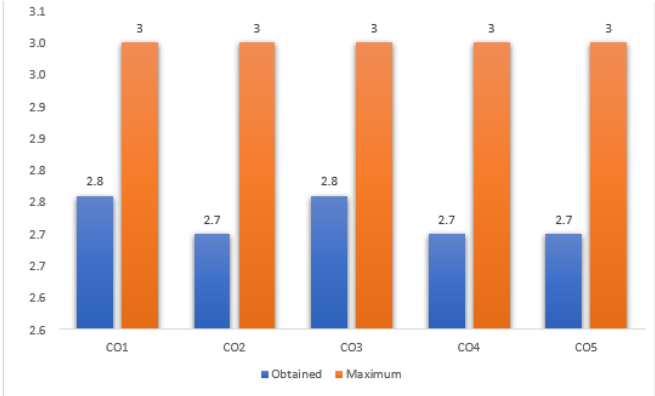
3				H		H					H		
4			H	H			H				H		
5		H						H		H			

H: Highly Supportive S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	37.0	0.0	2.4	100.0	3.0	3.0	2.8
CO2	96.3	3.0			100.0	3.0			100.0	3.0	37.0	0.0	2.3	100.0	3.0	3.0	2.7
CO3	96.3	3.0	100.0	3.0	100.0	3.0			100.0	3.0	37.0	0.0	2.4	100.0	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	37.0	0.0	2.3	100.0	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	37.0	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76		H 2.76					H 2.76
CO2		H 2.7			H 2.7			
CO3				H 2.76		H 2.76		
CO4			H 2.7	H 2.7			H 2.7	
CO5		H 2.7						H 2.7
AVERAGE OF COS FOR POS	2.76	2.7	2.73	2.73	2.7	2.76	2.7	2.73
AVERAGE OF POS	2.76	2.7	2.715	2.73	2.7	2.76	2.7	2.715
AVERAGE	2.7225							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: OPERATIONS RESEARCH
COURSE CODE: BS18048
CREDITS: 4

DEPARTMENT: COMPUTER SCEINCE AND ENGINEERING

PROGRAMME OUTCOMES:
BSC

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.

• **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.
PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL): **Students will be able to:** PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems. PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions. PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity. PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**CO1**.**Construct** the simplex table and to plan the optimum results.	VI(CREATE)
CO2	**CO2 Use** the program for optimizing the cost involved in transportation problems	III (APPLY)
CO3	**CO3 Develop** and solve transformation models and assignment models	VI(CREATE)
CO4	**CO4:Explain** the methods used by organizations to obtain the right quantities of stock or inventory	II(UNDERSTANDING)
CO5	**CO5:** To **Define**basic characteristic features of a queuing system and acquire skills in analyzing queuing models.	I(REMEMBER)

TABLE 1: CO, PO, PSO MAPPING

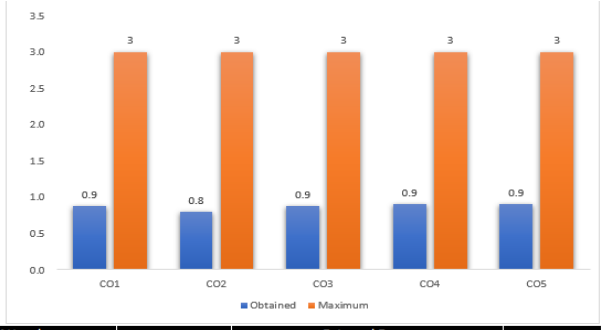
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1			H		H		H			H	H	H	
2	H	S		H		H				H	S	H	
3		H		H		S		H		H	S	H	
4	H		H					H		H	H	H	
5		H			H	H				H	H	H	

H: Highly Supportive S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	84.9	2.0			100.0	3.0	100.0	3.0	100.0	3.0	56.6	0.0	2.2	54.7	0.0	0.0	0.9
CO2	84.9	2.0			100.0	3.0			100.0	3.0	56.6	0.0	2.0	54.7	0.0	0.0	0.8
CO3	84.9	2.0	100.0	3.0	100.0	3.0			100.0	3.0	56.6	0.0	2.2	54.7	0.0	0.0	0.9
CO4			100.0	3.0	100.0	3.0			100.0	3.0	56.6	0.0	2.3	54.7	0.0	0.0	0.9
CO5			100.0	3.0	100.0	3.0			100.0	3.0	56.6	0.0	2.3	54.7	0.0	0.0	0.9

AVERAGE	AVERAGE
0	0.872

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1			H 0.88		H 0.88		H 0.88	
CO2	H 0.8			H 0.8		H 0.8		
CO3		H 0.88		H 0.88				H 0.88
CO4	H 0.9		H 0.9					H 0.9
CO5		H 0.9			H 0.9	H 0.9		
AVERAGE OF COS FOR POS	0.85	0.89	0.89	0.84	0.89	0.85	0.88	0.89
AVERAGE OF POS	0.85	0.89	0.895	0.84	0.895	0.85	0.88	0.89
AVERAGE	0.87375							

COURSE TITLE: ADVANCED JAVA
COURSE CODE: CS18502
CREDITS: 4

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES(BSC) :

BSc.

- **PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.**
- **PO2. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.**
- **PO3.Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.**
- **PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.**
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- **PO6.Individual and team work: Function objectively as an individual and as a member in diverse teams.**
- **PO7. Communication: Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.**
- **PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.**

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL

CO1	Select appropriate data structures for real world problems	IV (Analyze)
CO2	Develop component-based applications using JavaBeans and well formed XML document.	VI (Create)
CO3	Develop client/server applications using Servlets and JSP.	VI (Create)
CO4	Use SQL to obtain data from data bases	III (Apply)
CO5	Identify the type of socket used for connection and implement TCP/IP socket programming.	IV (Analyze)

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	**Programme Outcomes**								**Program Specific outcomes**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**H**			**H**					**H**	**H**			
2		**H**		**H**				**H**	**H**				
3		**H**		**H**				**H**			**H**		
4	**H**			**H**				**H**	**H**				

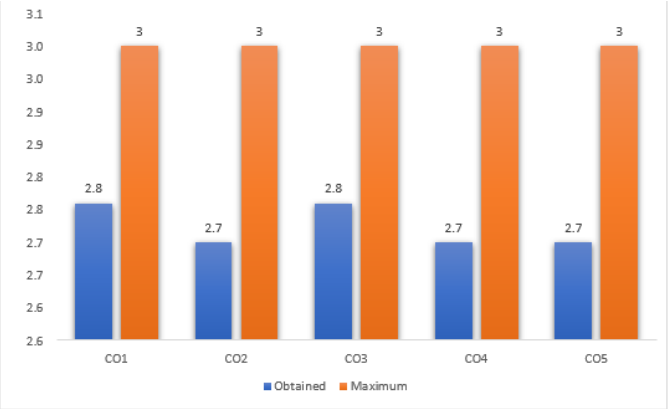
5		**H**		**H**						**H**	**H**		

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	88.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	52.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	88.7	3.0			100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	88.7	3.0	98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.4	100.0	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7
CO5			98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76							
CO2		H 2.7		H 2.7				H 2.7
CO3		H 2.76		H 2.76				H 2.76
CO4	H 2.7			H 2.7				H 2.7
CO5		H 2.7		H 2.7				
AVERAGE OF COS FOR POS	2.73	2.72		2.715				2.72
AVERAGE OF POS	2.715	2.72		2.715				2.72
AVERAGE	2.7175							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: EnvironmentalStudies and GenderSensitization
CREDITS: 4
COURSE CODE:ES18101

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well asmathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.

- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.

- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Understand** the importance of Environmental education, conservation of natural resources & Understand the importance of ecosystems and biodiversity	II (UNDERSTAND)
CO2	**Understand** the pollution problems and Apply the environmental science knowledge on solid waste management, disaster management	II(UNDERSTAND)
CO3	**Apply** the environmental science knowledge to Improve the resources and Evaluate and understand the sustainable environmental conditions and control methods	III (APPLY)
CO4	**Identify** the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems	VI(CREATE)
CO5	**Understand** the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislations	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H			H			H	S		H	H	
C02		H				H		H	H		H	
C03	H		H		H	H		H		H		S

C04	H	S										H
C05	H		H	H	S	H				H	S	

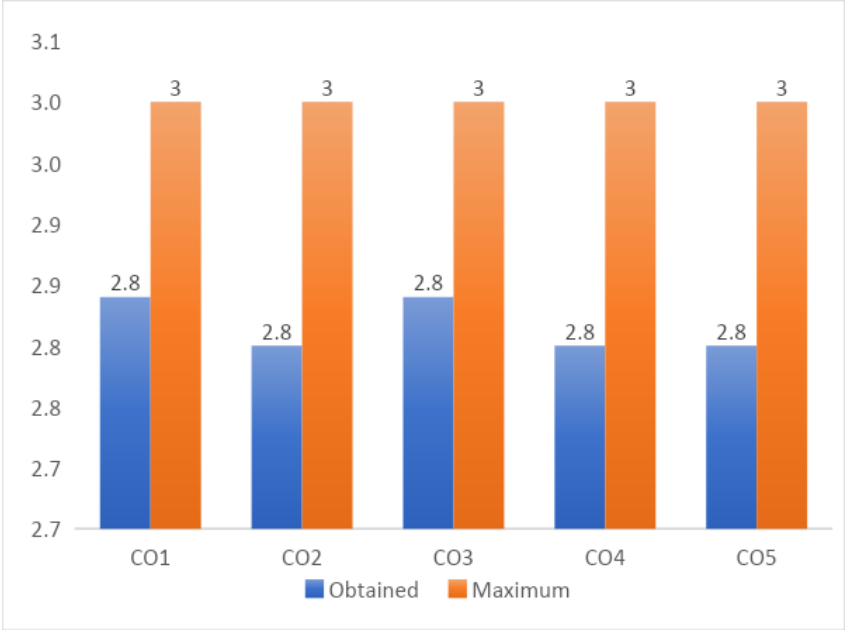
H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	72.2	1.0	2.6	98.1	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	72.2	1.0	2.5	98.1	3.0	3.0	2.8
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	72.2	1.0	2.6	98.1	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	72.2	1.0	2.5	98.1	3.0	3.0	2.8
CO5			100.0	3.0	100.0	3.0			100.0	3.0	72.2	1.0	2.5	98.1	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.816

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.84			H 2.84			H 2.84	
CO2		H 2.8				H 2.8		H 2.8

CO3	H 2.84		H 2.84		H 2.84	H 2.84		H 2.84
CO4	H 2.8							
CO5	H 2.8		H 2.8	H 2.8		H 2.8		
AVERAGE OF COS FOR POS	2.82	2.8	2.82	2.82	2.84	2.813333333	2.84	2.82
AVERAGE OF POS	2.815	2.8	2.82	2.81	2.84	2.813333	2.84	2.82
AVERAGE	2.819791667							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: OPERATING SYSTEM
COURSE CODE: BS18330
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well asmathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.

- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Explain** functions, types and structures of operating system	II (UNDERSYAND)
CO2	**Analyze**various process management concepts including scheduling and synchronization	IV(ANALYZE)
CO3	**Demonstrate** process synchronization and dead locks	II (UNDERSTAND)
CO4	**Solve** issues related to file system interface	III(APPLY)
CO5	**Choose** an appropriate Page replacement algorithm	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		H						H	H		
C02	H	H		H					H		H	
C03		H		H				H	H	H		
C04		H		H					H		H	
C05		H						H	H	H	H	

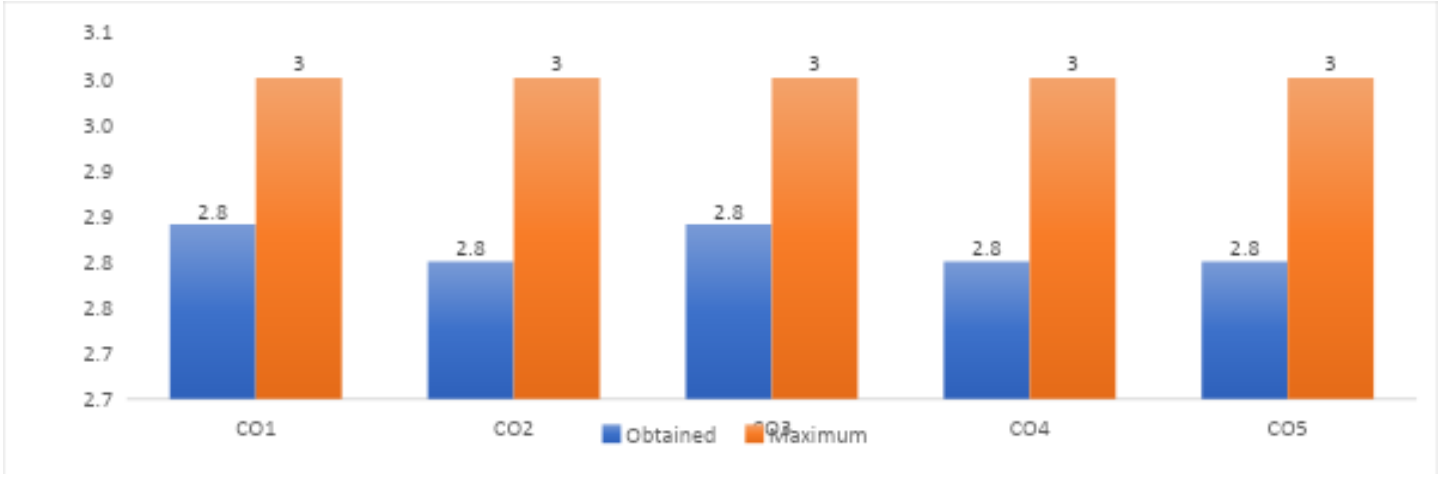
H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



Co	mid exam 1		mid exam 2		group discussion	Assignment		Viva		Attendence			External Exam				
	pass %	Attainment level	pass %	Attainment level	pass%	Attainment level	pass %	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			112.5	3.0	112.5	3.0	112.5	3.0	66.7	1.0	2.6	104.2	3.0	3.0	2.8
CO2	100.0	3.0			112.5	3.0			112.5	3.0	66.7	1.0	2.5	104.2	3.0	3.0	2.8
CO3	100.0	3.0	110.4	3.0	112.5	3.0			112.5	3.0	66.7	1.0	2.6	104.2	3.0	3.0	2.8
CO4			110.4	3.0	112.5	3.0			112.5	3.0	66.7	1.0	2.5	104.2	3.0	3.0	2.8
CO5			110.4	3.0	112.5	3.0			112.5	3.0	66.7	1.0	2.5	104.2	3.0	3.0	2.8

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.84		H 2.84					
CO2	H 2.8	H 2.8		H 2.8				
CO3		H 2.84		H 2.84				H 2.84
CO4		H 2.8		H 2.8				
CO5		H 2.8						H 2.8
AVERAGE OF COS FOR POS	2.82	2.81	2.84	2.813333333				2.82

AVERAGE OF POS	2.81	2.81	2.84	2.813333				2.82
AVERAGE	2.818666667							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Electrical Circuits and Machine
COURSE CODE: CS18301
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.

- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Student will be able to **analyze**the electrical circuits with help of KCL and KVL techniques.	IV (ANALYZE)
CO2	Students will be able to **explain** the operation of DC generator and analyze the Characteristics of DC generator.	II (UNDERSTAND)
CO3	Student will be able to **explain** the principle of operation of DC motor and analyzetheir Characteristics. Acquire the skills to analyze the starting and speed control methods of DC motors.	II (UNDERSTAND)
CO4	**Judge** to develop equivalent circuit and evaluate performance of transformers.	V(EVALUTING)
CO5	**Ability** to identify speed – torque characteristics of induction motor and understand starting methods of induction motor.	I(REMEMBER)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H								H			
C02				H								
C03						H				H		
C04	H											H
C05	H											H

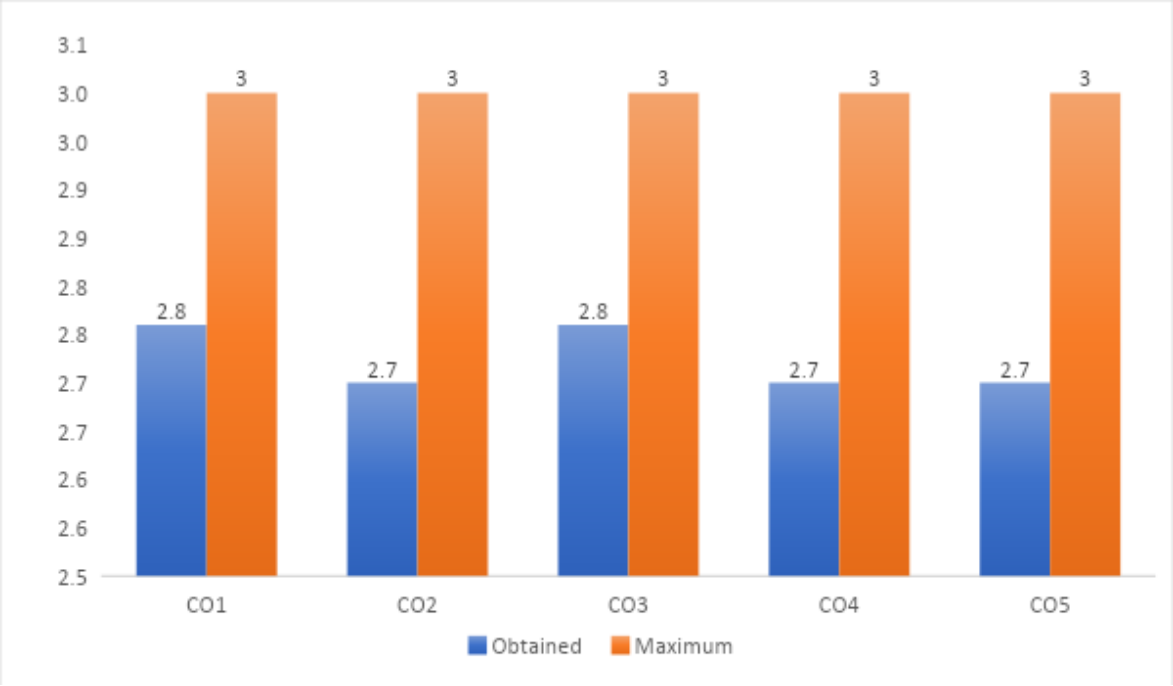
H: Highly Supportive

S: Supportive

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

Table 2: COURSE OUTCOME ATTAINMENT



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	53.7	0.0	2.4	90.7	3.0	3.0	2.8
CO2	96.3	3.0			100.0	3.0			100.0	3.0	53.7	0.0	2.3	90.7	3.0	3.0	2.7

CO3	96.3	3.0	92.6	3.0	100.0	3.0			100.0	3.0	53.7	0.0	2.4	90.7	3.0	3.0	2.8
CO4			92.6	3.0	100.0	3.0			100.0	3.0	53.7	0.0	2.3	90.7	3.0	3.0	2.7
CO5			92.6	3.0	100.0	3.0			100.0	3.0	53.7	0.0	2.3	90.7	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76							
CO2				H 2.7				
CO3						H 2.76		

CO4	H	2.7							
CO5	H	2.7							
AVERAGE OF COS FOR POS	2.72				2.7		2.76		
AVERAGE OF POS	2.706667				2.7		2.76		
AVERAGE	2.722222222								

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Object orientedProgramming throughJava **COURSE CODE: CS20302** **CREDITS: 4**
DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING
Programme Outcomes – (B. Sc.) ● **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well asmathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Understand** fundamentals of objectoriented concept, classes, objects and methods	II (UNDERSTAND)

CO2	**Apply** inheritance, packages and exceptional handling techniques.	III(APPLY)
CO3	**Demonstrate** Threads and applet programming.	II (UNDERSTAND)
CO4	**Express** event handling and swing components.	V(EVALUTING)
CO5	**Design** interactive programs using swing	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H								H			
C02		H						H		H		H
C03	H		H	H					H		H	
C04			H	H				H		H	S	H
C05			H		S			H		H		H

H: Highly Supportive

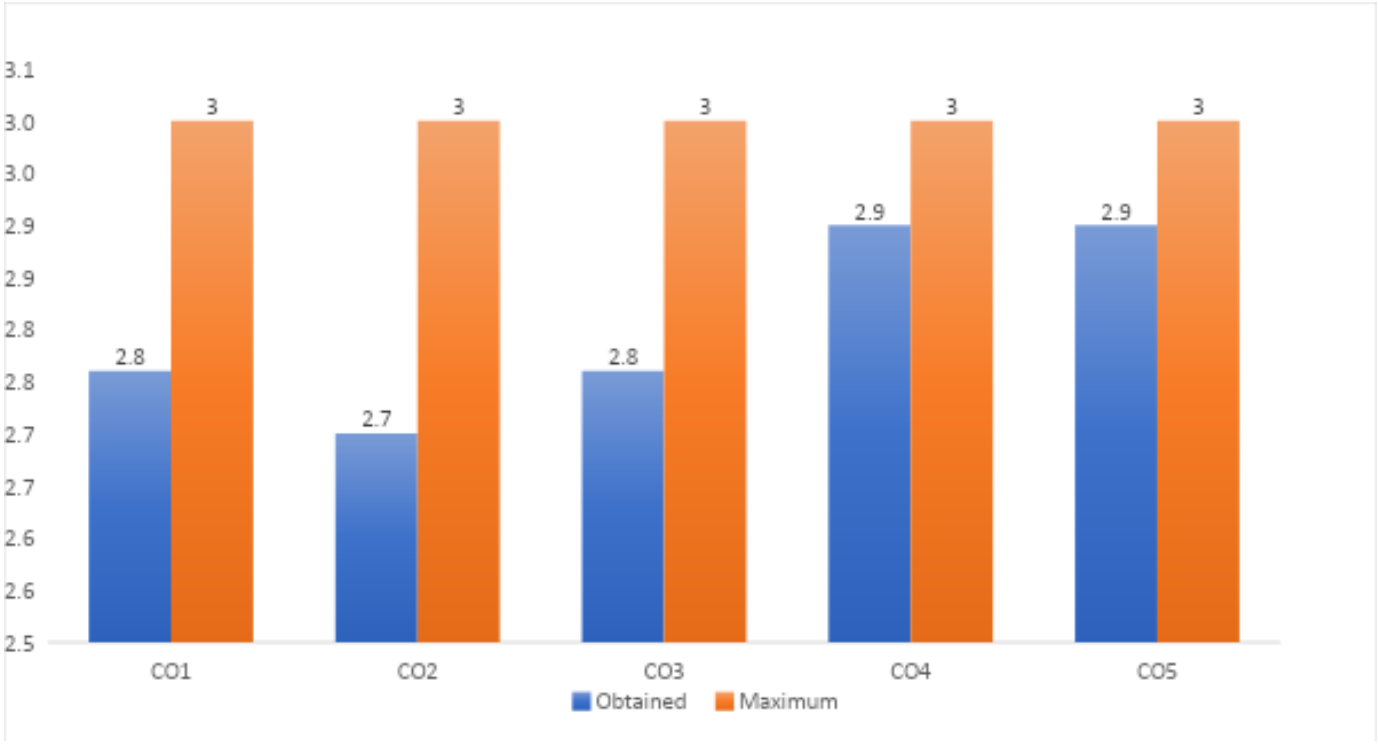
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2

Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	70.4	1.0			100.0	3.0	100.0	3.0	100.0	3.0	79.6	2.0	2.4	100.0	3.0	3.0	2.8
CO2	70.4	1.0			100.0	3.0			100.0	3.0	79.6	2.0	2.3	100.0	3.0	3.0	2.7
CO3	70.4	1.0	88.9	3.0	100.0	3.0			100.0	3.0	79.6	2.0	2.4	100.0	3.0	3.0	2.8
CO4			88.9	3.0	100.0	3.0			100.0	3.0	79.6	2.0	2.8	100.0	3.0	3.0	2.9

CO5			88.9	3.0	100.0	3.0			100.0	3.0	79.6	2.0	2.8	100.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.804

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76							
CO2		H 2.7						H 2.7
CO3	H 2.76		H 2.76	H 2.76				
CO4			H 2.9	H 2.9				H 2.9
CO5			H 2.9					H 2.9
AVERAGE OF COS FOR POS	2.76	2.7	2.853333333	2.83				2.833333333
AVERAGE OF POS	2.76	2.7	2.853333	2.83				2.833333
AVERAGE	2.795333333							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DISCRETE MATHEMATICS
COURSE CODE: BS18335
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well asmathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Develop** understanding of Logic Sets and Functions	VI(CREATE)
CO2	**Evaluate** and apply the fundamental concepts in graph theory	V(EVALUATING)
CO3	**Develop** an understanding of how graph and tree concepts are used to solve problems arising in the computer science.	VI(CREATE)
CO4	**Express** the concepts and results of Number Theory.	III(APPLY)
CO5	**Identify** methods and techniques used in number theory.	III(APPLY)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H			H			H	S		H	H	
C02		H				H		H	H		H	
C03	H		H		H	H		H		H		S
C04	H	S										H
C05	H	H	H	H	S	H				H	S	

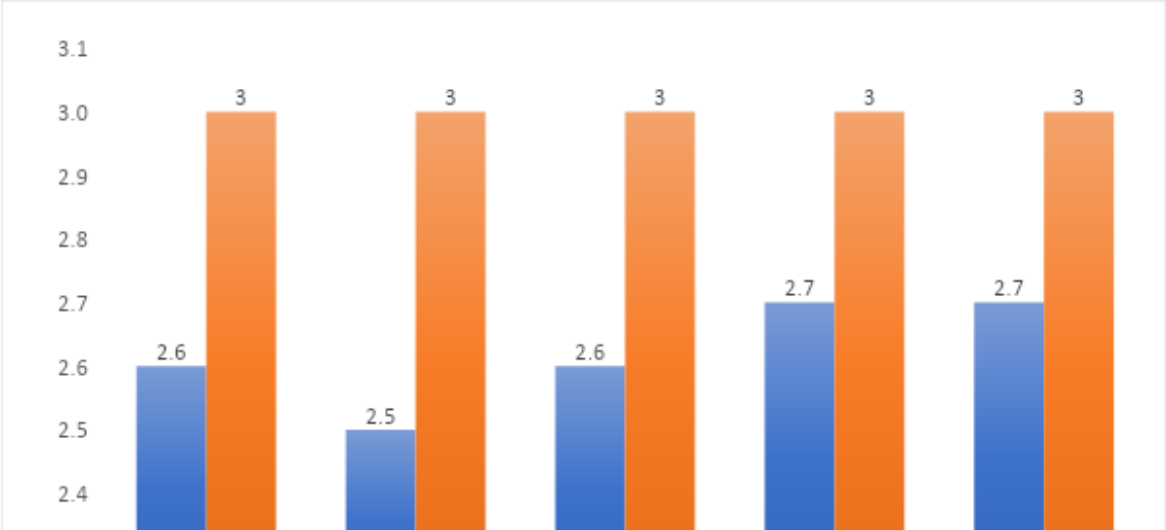
H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		Viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	70.4	1.0			98.1	3.0	96.3	3.0	96.3	3.0	42.6	0.0	2.0	100.0	3.0	3.0	2.6
CO2	70.4	1.0			98.1	3.0			96.3	3.0	42.6	0.0	1.8	100.0	3.0	3.0	2.5
CO3	70.4	1.0	87.0	3.0	98.1	3.0			96.3	3.0	42.6	0.0	2.0	100.0	3.0	3.0	2.6
CO4			87.0	3.0	98.1	3.0			96.3	3.0	42.6	0.0	2.3	100.0	3.0	3.0	2.7
CO5			87.0	3.0	98.1	3.0			96.3	3.0	42.6	0.0	2.3	100.0	3.0	3.0	2.7

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.6			H 2.6			H 2.6	
CO2		H 2.5				H 2.5		H 2.5
CO3	H 2.6		H 2.6		H 2.6	H 2.6		H 2.6
CO4	H 2.7							

CO5	H 2.7	H 2.7	H 2.7	H 2.7		H 2.7		
AVERAGE OF COS FOR POS	2.65	2.6	2.65	2.65	2.6	2.6	2.6	2.55
AVERAGE OF POS	2.6625	2.6	2.65	2.675	2.6	2.6	2.6	2.55
AVERAGE	2.6171875							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: VALUE EDUCATION & PERSONALITY DEVELOPMENT
COURSE CODE: VE18101
CREDITS: 2

DEPARTMENT: COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

PO1:Scientific knowledge: Apply the knowledge of science, mathematics, engineering and technology fundamentals to solve the complex problems.
PO2:Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO3: Problem Analysis: Identify, formulate, research literature, and analyse complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences,
PO4: Modern tool usage: create, select and apply appropriate techniques, resources and modern technology and IT tools to complex science and technological activities.
PO5: Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development,
PO6: Individual and team work: function objectively as an individual and as a member in diverse teams.
PO7: Communication: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:
B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	To **identify** a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence.	III(APPLY)
CO2	To **paraphrase** ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.	IV(ANALYZING)
CO3	To **create** an understanding on Indian Literature, alongside to develop and chisel their communication skills.	VI(CREATE)
CO4	To **recognize** the moral element which underlies in the short story; an exposure to informal language.	I(REMEMBER)
CO5	To **develop** listening and speaking skills through effective sentence constructions and efficient delivery .	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H			H			H	S		H	H		
2		H				H		H	H		H		
3	H		H		H	H		H		H		S	
4	H	S										H	
5	H		H	H	S	H				H	S		

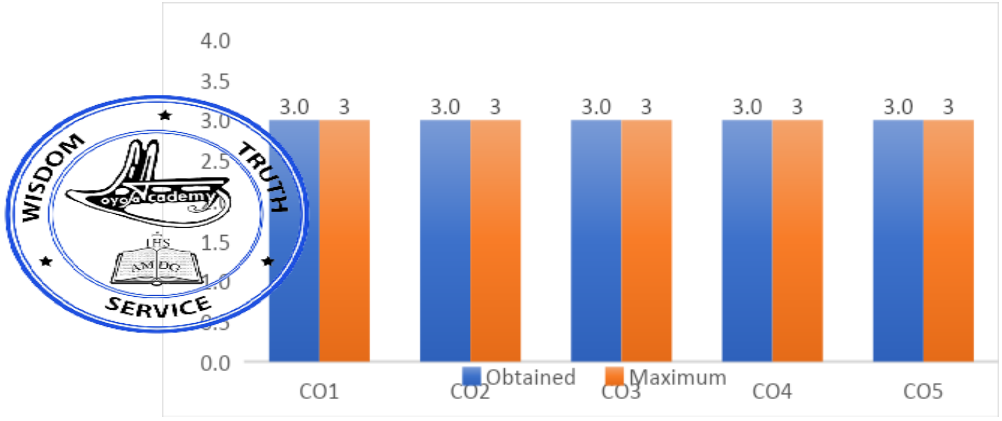
H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co		mid exam 1	mid exam 2	group discussion	assignment	Viva	Attendence		External Exam	

	pass %		Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal average	pass %	Attainment level	co wise external average	co wise total average
CO 1	100.0		3.0			100.0	3.0	94.4	3.0	94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO 2	100.0		3.0			100.0	3.0			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO 3	100.0		3.0	100.0	3.0	100.0	3.0			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO 4				100.0	3.0	100.0	3.0			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0

CO 5				100.0	3.0	100.0	3.0			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 3			H 3			H 3	
CO2		H 3				H 3		H 3
CO3	H 3		H 3		H 3	H 3		H 3
CO4	H 3							
CO5	H 3		H 3	H 3		H 3		
AVERAGE OF COS FOR POS	3	3	3	3	3	3	3	3
AVERAGE OF POS	3	3	3	3	3	3	3	3
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS
COURSE CODE: CS22102
CREDITS: 4

DEPARTMENT: COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

PO1:Scientific knowledge: Apply the knowledge of science, mathematics, engineering and technology fundamentals to solve the complex problems.

PO2:Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO3: Problem Analysis: Identify, formulate, research literature, and analyse complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences,

PO4: Modern tool usage: create, select and apply appropriate techniques, resources and modern technology and IT tools to complex science and technological activities.

PO5: Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development,

PO6: Individual and team work: function objectively as an individual and as a member in diverse teams.

PO7: Communication: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.

PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:

B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**Explain** the various voltages across and current flow through electronic devices in various configurations, junction with varying doping concentrations.	(II) Understand
CO2	**Design** and construct amplifier and oscillator circuits and differentiate between them	(VI) Create
CO3	**Design** and construct a DC power supply	(VI) Create
CO4	Analyze various factors influencing a transistor.	(IV) Analyze
CO5	Analyze the characteristics of amplifiers, timers and oscillators	(IV) Analyze

Table 1: CO, PO, PSO MAPPING

	Programme Outcomes	**Program Specific**

Course outcomes	outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H		H					H	S	H			
2	H	H				H				S	H		
3			H		H			H	S				
4		H			S		H		S			H	
5	H	H		S		H		S		S		H	

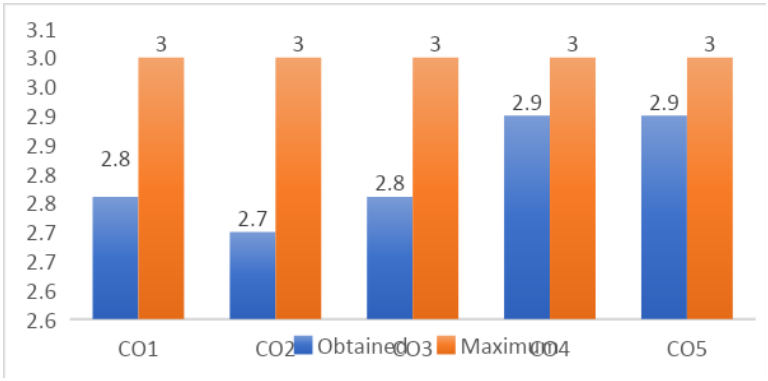
H: Highly Supportive S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2

Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam		
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average

CO1	66.0	1.0			101.9	3.0	101.9	3.0	101.9	3.0	84.9	2.0	2.4	92.5	3.0	3.0	2.8
CO2	66.0	1.0			101.9	3.0			101.9	3.0	84.9	2.0	2.3	92.5	3.0	3.0	2.7
CO3	66.0	1.0	98.1	3.0	101.9	3.0			101.9	3.0	84.9	2.0	2.4	92.5	3.0	3.0	2.8
CO4			98.1	3.0	101.9	3.0			101.9	3.0	84.9	2.0	2.8	92.5	3.0	3.0	2.9
CO5			98.1	3.0	101.9	3.0			101.9	3.0	84.9	2.0	2.8	92.5	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.804

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76		H 2.76					H 2.76
CO2	H 2.7	H 2.7				H 2.7		

CO3			H 2.76		H 2.76			H 2.76
CO4		H 2.9					H 2.9	
CO5	H 2.9	H 2.9				H 2.9		
AVERAGE OF COS FOR POS	2.786666667	2.833333333	2.76		2.76	2.8	2.9	2.76
AVERAGE OF POS	2.795555556	2.833333333	2.76		2.76	2.8	2.9	2.76
AVERAGE	2.801269841							

COURSE TITLE: MATHEMATICS -I

COURSE CODE: BS19101

CREDITS: 4

DEPARTMENT: COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

PO1:Scientific knowledge: Apply the knowledge of science, mathematics, engineering and technology fundamentals to solve the complex problems.

PO2:Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO3: Problem Analysis: Identify, formulate, research literature, and analyse complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences,

PO4: Modern tool usage: create, select and apply appropriate techniques, resources and modern technology and IT tools to complex science and technological activities.

PO5: Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development,

PO6: Individual and team work: function objectively as an individual and as a member in diverse teams.

PO7: Communication: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.

PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:

B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**CO 1:** To identify a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence.	IV(analyze)
CO2	**CO 2:** To paraphrase ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.	II(understand)
CO3	**CO3**: To create an understanding on Indian Literature, alongside to develop and chisel their communication skills.	VI(create)

CO4	**CO4:** To recognize the moral element which underlies in the short story; an exposure to informal language.	I (REMEMBER)
CO5	**CO5**: To develop listening and speaking skills through effective sentence constructions and efficient delivery .	VI(create)

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H			H			H	S		H	H		
2		H				H		H	H		H		
3	H		H		H	H		H		H		S	
4	H	S										H	
5	H		H	H	S	H				H	S		

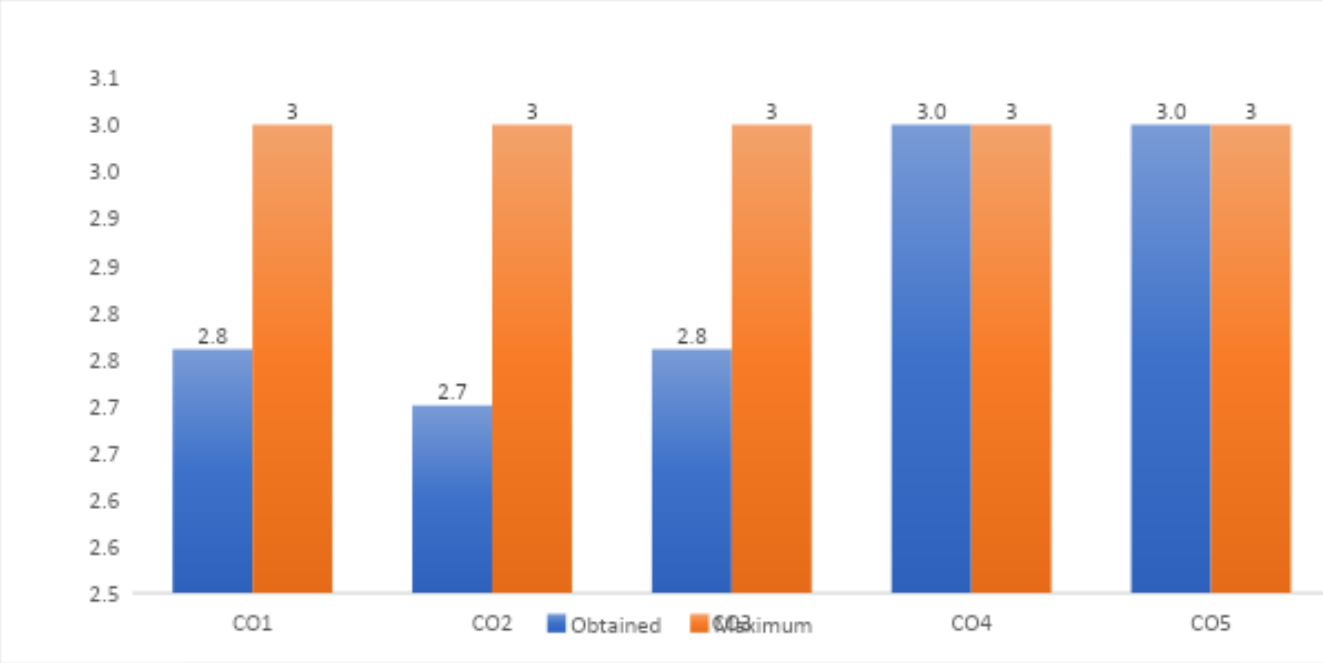
H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



Co	mid exam 1		mid exam 2		group discussion		assignment		Viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO2	96.3	3.0			100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO3	96.3	3.0	96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO4			96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO5			96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
																AVERAGE	AVERAGE
																3	1.8

RESULT ANALYSIS: **(Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)**

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 1.8			H 1.8			H 1.8	
CO2		H 1.8				H 1.8		H 1.8
CO3	H 1.8		H 1.8		H 1.8	H 1.8		H 1.8

CO4	H 1.8							
CO5	H 1.8		H 1.8	H 1.8		H 1.8		
AVERAGE OF COS FOR POS	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
AVERAGE OF POS	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
AVERAGE	1.8							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Problem Solving andProgramming in C
CREDITS: 4
COURSE CODE:BS19123

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.

- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well asmathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Explain** the basic introduction of computer and programming languages	II (UNDERSTAND)
CO2	**Categorize** different data types, operators and data input /output functions in 'C'.	IV(ANALYZE))
CO3	**Develop** programs using C control structures arrays and string concept	III (APPLY)
CO4	**Analyze** large problems into smaller ones using C functions	IV(ANALYZE)
CO5	**Create** programs using the concept of structures, union, file handling in C	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		S	H					H	S		
C02		H		H					H			S
C03		S	H						H		H	
C04	H	H	H						S		H	
C05	H	H	H							H		

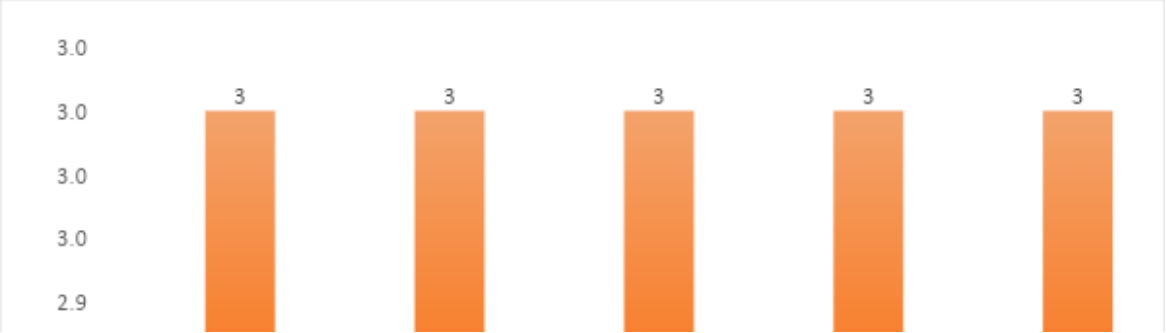
H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



Co	mid exam 1		mid exam 2		group discussion		assignment		Viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	88.9	3.0			100.0	3.0	100.0	3.0	100.0	3.0	83.3	2.0	2.8	100.0	3.0	3.0	2.9
CO2	88.9	3.0			100.0	3.0			100.0	3.0	83.3	2.0	2.8	100.0	3.0	3.0	2.9

CO3	88.9	3.0	100.0	3.0	100.0	3.0			100.0	3.0	83.3	2.0	2.8	100.0	3.0	3.0	2.9
CO4			100.0	3.0	100.0	3.0			100.0	3.0	83.3	2.0	2.8	100.0	3.0	3.0	2.9
CO5			100.0	3.0	100.0	3.0			100.0	3.0	83.3	2.0	2.8	100.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.908

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.92			H 2.92				
CO2		H 2.9		H 2.9				
CO3			H 2.92					
CO4	H 2.9	H 2.9	H 2.9					
CO5	H 2.9	H 2.9	H 2.9					
AVERAGE OF COS FOR POS	2.906666667	2.9	2.906666667	2.91				
AVERAGE OF POS	2.902222	2.9	2.906667	2.905				
AVERAGE	2.903472222							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: General English-I **CREDITS: 3** **COURSE CODE:EN18101**
DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING
<u>Programme Outcomes – (B. Sc.)</u> ● **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well asmathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems,Computer Programming and Networking related concepts of computer science andapply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related tonetworking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinaryenvironment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL

CO1	**To distinguish** between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage of language and for developing the art of parallel listening and writing.	II (ANALYZE)
CO2	**To construct** vocabulary and to gain understanding on the tense component, a pivotal constituent for language structuring and vocabulary building**.**	VI(CREATE)
CO3	To **identify** with economical word constructions, paying specific attention in constructing sound writing skills.	III (APPLY)
CO4	To **interpret** functional grammar, the basic part involved in sentence constructing to improve linguistic skills.	V(EVALUATE)
CO5	**To develop** communication skills to provide a platform for language efficiency for effective language delivery.	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

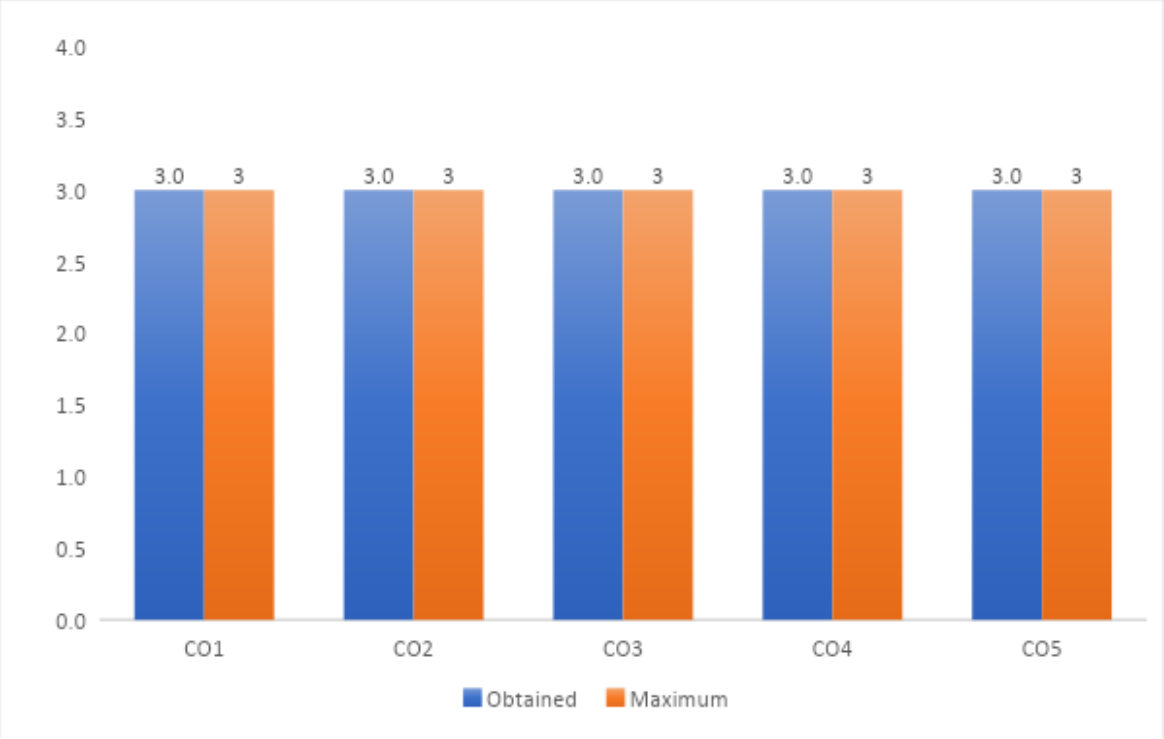
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		S	H					H	S		
C02		H		H					H			S
C03		S	H						H		H	
C04	H	H	H						S		H	
C05	H	H	H							H		

H: Highly Supportive
S:
Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		Viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			96.3	3.0	96.3	3.0	100.0	3.0	90.7	3.0	3.0	98.1	3.0	3.0	3.0
CO2	100.0	3.0			96.3	3.0			100.0	3.0	90.7	3.0	3.0	98.1	3.0	3.0	3.0
CO3	100.0	3.0	96.3	3.0	96.3	3.0			100.0	3.0	90.7	3.0	3.0	98.1	3.0	3.0	3.0
CO4			96.3	3.0	96.3	3.0			100.0	3.0	90.7	3.0	3.0	98.1	3.0	3.0	3.0
CO5			96.3	3.0	96.3	3.0			100.0	3.0	90.7	3.0	3.0	98.1	3.0	3.0	3.0
																AVERAGE	AVERAGE
																3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 3			H 3				
CO2		H 3		H 3				
CO3			H 3					
CO4	H 3	H 3	H 3					
CO5	H 3	H 3	H 3					

AVERAGE OF COS FOR POS	3	3	3	3				
AVERAGE OF POS	3	3	3	3				
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ENGINEERING PHYSICS
COURSE CODE:BS19121
CREDITS: 4

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

- **PO1: Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**: **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3: Problem analysis:** Identify, formulate, research literature, andanalyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4:Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.

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- **PO6: Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7: Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8: Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

- **PSO1**: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyzecomputer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Apply** Fundamental electromagnetic concepts for various applications including wireless and optical communications.	II (ANALYZE)

CO2	**Design** different applications of lasers and fibre optics in the field of industry, medical and telecommunications	VI(CREATE)
CO3	**Distinguish** the various crystalline materials and to understand the crystallographic techniques.	III (APPLY)
CO4	**Apply** concepts of wave and particle nature of material particles for various engineering applications	V(EVALUATE)
CO5	**Develop** different devices with more efficiency using superconducting and nano materials.	VI(CREATE)

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	**Programme Outcomes**								**Program Specific outcomes**			
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
1	**H**		**H**					**H**	**S**			
2	**H**			**H**					**S**			
3	**H**							**H**	**S**			

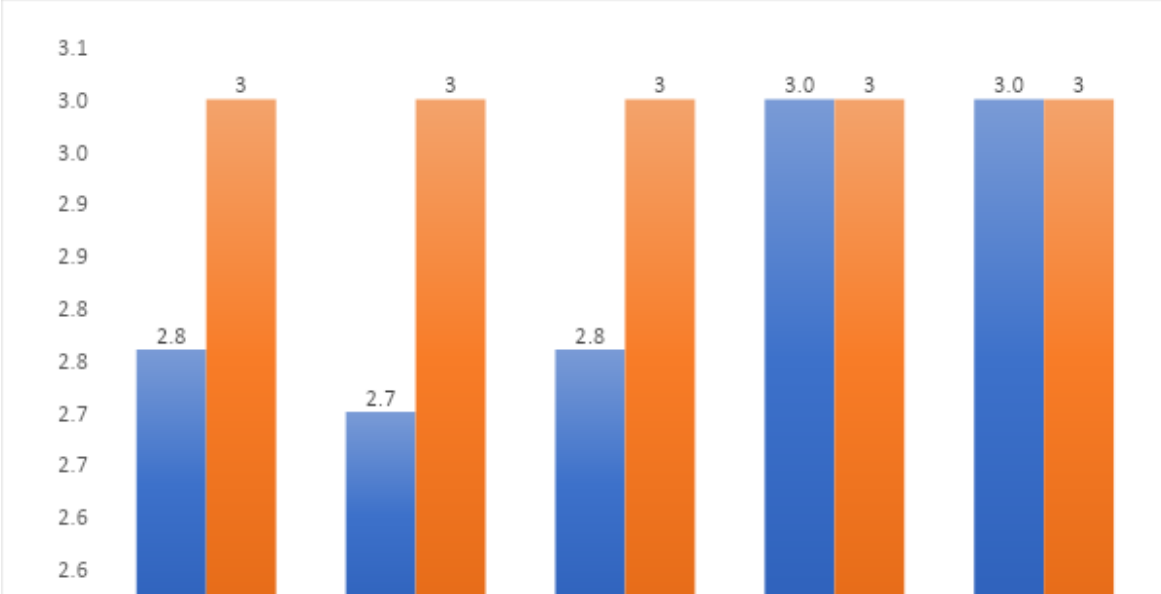
4	**H**							**H**	**S**			
5	**H**			**H**					**S**			

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1	mid exam 2	group discussion	assignment	Viva	Attendence		External Exam	

	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	46.3	0.0			100.0	3.0	100.0	3.0	100.0	3.0	92.6	3.0	2.4	98.1	3.0	3.0	2.8
CO2	46.3	0.0			100.0	3.0			100.0	3.0	92.6	3.0	2.3	98.1	3.0	3.0	2.7
CO3	46.3	0.0	100.0	3.0	100.0	3.0			100.0	3.0	92.6	3.0	2.4	98.1	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	92.6	3.0	3.0	98.1	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	92.6	3.0	3.0	98.1	3.0	3.0	3.0

AVERAGE	AVERAGE
3	2.844

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the midsemester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8

CO1	H 2.76		H 2.76					H 2.76
CO2	H 2.7			H 2.7				
CO3	H 2.76							H 2.76
CO4	H 3							H 3
CO5	H 3			H 3				
AVERAGE OF COS FOR POS	2.844		2.76	2.85				2.84
AVERAGE OF POS	2.8608		2.76	2.85				2.866667
AVERAGE	2.834366667							