COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: GENERALENGLISH I

COURSE CODE: EN23101

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

Programme Outcomes – (B. Sc.)

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: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**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.	IV (ANALYSING)
CO2	**CO2:** To construct vocabulary and to gain understanding on the tense component, a pivotal constituent for language structuring and vocabulary building.	III (APPLYING)
CO3	**CO3:** To identify with economical word constructions, paying specific attention in constructing sound writing skills.	III (APPLYING)
CO4	**CO4:** To interpret functional grammar, the basic part involved in sentence constructing to improve linguistic skills.	II (UNDERSTANDING)
CO5	**CO5:** To develop communication skills to provide a platform for language efficiency for effective language deliver.	III (APPLYING)

Table 1: CO, PO, PSO MAPPING

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

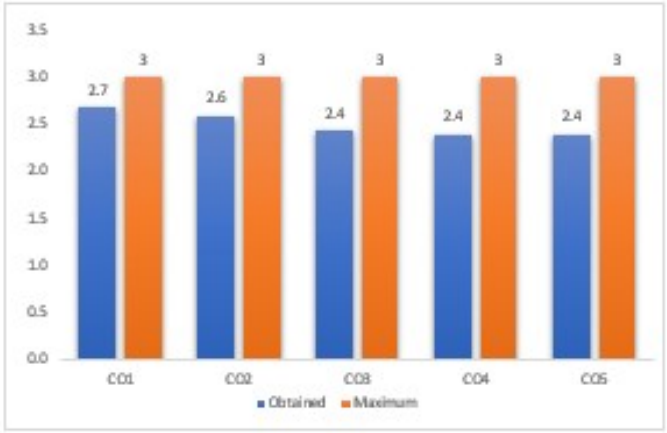
H: Highly Supportive

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	76.0	2.0			92.0	3.0	100.0	3.0	100.0	3.0	64.0	0.0	2.2	98.0	3.0	3.0	2.7
CO2	76.0	2.0			92.0	3.0			100.0	3.0	64.0	0.0	2.0	98.0	3.0	3.0	2.6
CO3	76.0	2.0	46.0	0.0	92.0	3.0			100.0	3.0	64.0	0.0	1.6	98.0	3.0	3.0	2.4
CO4			46.0	0.0	92.0	3.0			100.0	3.0	64.0	0.0	1.5	98.0	3.0	3.0	2.4
CO5			46.0	0.0	92.0	3.0			100.0	3.0	64.0	0.0	1.5	98.0	3.0	3.0	2.4

AVERAGE	AVERAGE
3	2.504

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 second midsemester exam needs to improve to increase 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 2.68	H 2.68	H 2.68	
CO2					H 2.6	H 2.6	H 2.6	
CO3					H 2.44	H 2.44	H 2.44	
CO4					H 2.4	H 2.4	H 2.4	
CO5					H 2.4	H 2.4	H 2.4	
AVERAGE OF COS FOR POS					2.504	2.504	2.504	
AVERAGE OF POS					2.4688	2.4688	2.4688	
AVERAGE	2.4688							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: VALUE EDUCATION & PERSONALITY DEVELOPMENT

COURSE CODE: VE18101

CREDITS: 2

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

Programme Outcomes – (B. Sc.)

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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Students will be able to differentiate Accepted norms and counter values and be able to **identify** the various Dimensions of Human Development	III (APPLY)
CO2	**CO2:** Students will be able to **demonstrate** Love and Experience of God and identify the Basic Issues of Life and Happiness as a life goal	IV(ANALYZE)
CO3	**CO3:** They will able to **understand** the importance of concern for others and sritique the various problems that deter the growth of the society	III (APPLY)
CO4	**CO4:** The students will be able to recognize the traits of a good personality and practice Self exploration	VI(CREATE)
CO5	**CO5:** Students will be able to interpret the purpose of life and goal setting and demonstrate self-management	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

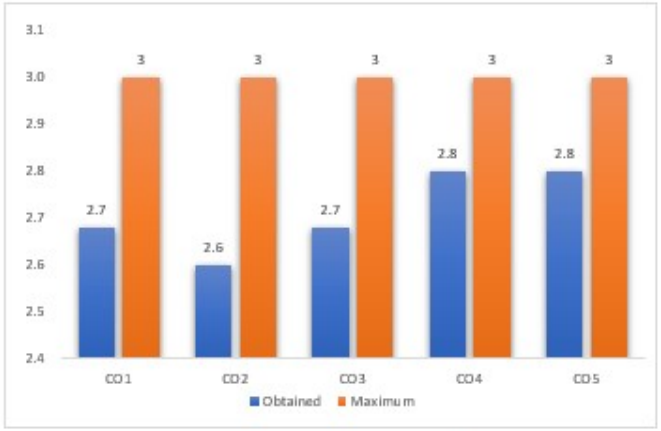
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01		H			H	H	H	H	H		H	
C02		H			H	H	H	H	H		H	
C03		H			H	H	H	H	H		H	
C04		H			H	H	H	H	H		H	
C05		H			H	H	H	H	H		H	

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	70.0	1.0			100.0	3.0	100.0	3.0	100.0	3.0	66.0	1.0	2.2	94.0	3.0	3.0	2.7
CO2	70.0	1.0			100.0	3.0			100.0	3.0	66.0	1.0	2.0	94.0	3.0	3.0	2.6
CO3	70.0	1.0	92.0	3.0	100.0	3.0			100.0	3.0	66.0	1.0	2.2	94.0	3.0	3.0	2.7
CO4			92.0	3.0	100.0	3.0			100.0	3.0	66.0	1.0	2.5	94.0	3.0	3.0	2.8
CO5			92.0	3.0	100.0	3.0			100.0	3.0	66.0	1.0	2.5	94.0	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.712

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 first midsemester exam needs to improve to increase 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 2.68			H 2.68	H 2.68	H 2.68	H 2.68
CO2		H 2.6			H 2.6	H 2.6	H 2.6	H 2.6
CO3		H 2.68			H 2.68	H 2.68	H 2.68	H 2.68
CO4		H 2.8			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	H 2.8
AVERAGE OF COS FOR POS		2.712			2.712	2.712	2.712	2.712
AVERAGE OF POS		2.7184			2.7184	2.7184	2.7184	2.7184
AVERAGE	2.7184							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: FUNDAMENTALS OF IT & DATA VISUALIZATION

COURSE CODE: CSML23101

CREDITS: 4

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

Programme Outcomes – (B. Sc.)

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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- **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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and

unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Understand basic computer terminology and number systems.	II (UNDERSTAND)
CO2	**CO2:** Learn about operating systems, and its types.	II (UNDERSTAND)
CO3	**CO3:** Learn about the applications of IT and Data Visualizations	II (UNDERSTAND)
CO4	**CO4:** Use of Data Visualizations.	III(APPLY)
CO5	**CO5:** Use of modern means of communications, types of networks and topologies.	III(APPLY)

Table 1: CO, PO, PSO MAPPING

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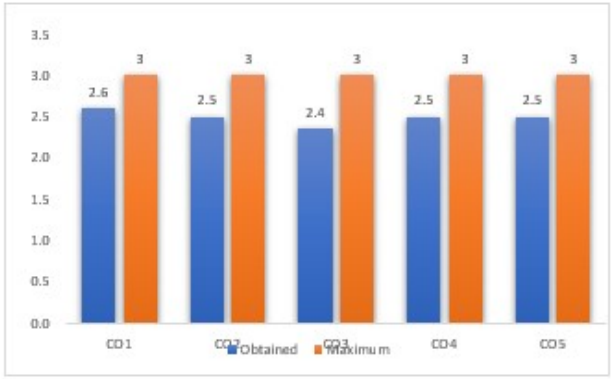

co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	50.0	0.0			100.0	3.0	100.0	3.0	100.0	3.0	68.0	1.0	2.0	92.0	3.0	3.0	2.6
CO2	50.0	0.0			100.0	3.0			100.0	3.0	68.0	1.0	1.8	92.0	3.0	3.0	2.5
CO3	50.0	0.0	56.0	0.0	100.0	3.0			100.0	3.0	68.0	1.0	1.4	92.0	3.0	3.0	2.4
CO4			56.0	0.0	100.0	3.0			100.0	3.0	68.0	1.0	1.8	92.0	3.0	3.0	2.5
CO5			56.0	0.0	100.0	3.0			100.0	3.0	68.0	1.0	1.8	92.0	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.492

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 second midsemester exam needs to improve to increase 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	H 2.6	
CO2			H 2.5		H 2.5	H 2.5	H 2.5	
CO3			H 2.36		H 2.36	H 2.36	H 2.36	
CO4			H 2.5		H 2.5	H 2.5	H 2.5	H 2.5
CO5			H 2.5		H 2.5	H 2.5	H 2.5	H 2.5
AVERAGE OF COS FOR POS			2.492		2.492	2.492	2.492	2.5
AVERAGE OF POS			2.4704		2.4704	2.4704	2.4704	2.5
AVERAGE	2.47632							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DIFFERENTIAL EQUATIONS&MATRICES

COURSE CODE: CSML23102

CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND MACHINE LEARNING

Programme Outcomes – (B. Sc.)

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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- **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:

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PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Classify the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors.	II (UNDERSTAND)
CO2	**CO2:**Analyze and Solve basic application problems described by first order differential equations such as orthogonal trajectories.	IV(ANALYZE)
CO3	**CO3:** Solve second order Homogeneous Equations with Constant Coefficients. Obtain exact and numerical solutions using differential equations technology.	III (APPLY)
CO4	**CO4:** Understand to find the rank and formulate the solution of set of a system of linear equations.	II (UNDERSTAND)
CO5	**CO5:** Determine the eigen values and eigen vectors.	V(EVALUATE)

Table 1: CO, PO, PSO MAPPING

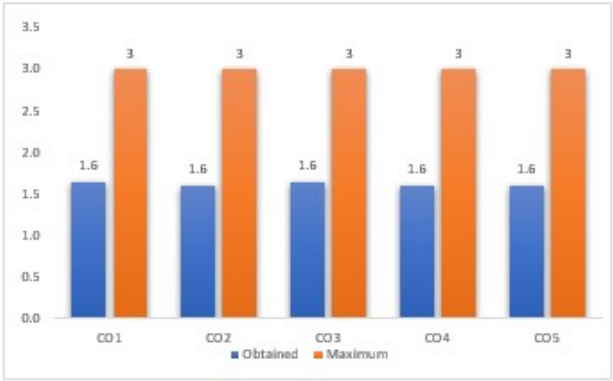
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H	H	H				H	H	H		H	H
C02	H	H	H				H	H	H		H	H
C03	H	H	H				H	H	H		H	H
C04	H	H	H				H	H	H		H	H
C05	H	H	H				H	H	H		H	H

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	98.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	72.0	1.0	2.6	74.0	1.0	1.0	1.6
CO2	98.0	3.0			100.0	3.0			100.0	3.0	72.0	1.0	2.5	74.0	1.0	1.0	1.6
CO3	98.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	72.0	1.0	2.6	74.0	1.0	1.0	1.6
CO4			100.0	3.0	100.0	3.0			100.0	3.0	72.0	1.0	2.5	74.0	1.0	1.0	1.6
CO5			100.0	3.0	100.0	3.0			100.0	3.0	72.0	1.0	2.5	74.0	1.0	1.0	1.6

AVERAGE	AVERAGE
1	1.616

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. The overall percentage reduced as because of less attendance.

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 1.72		H 1.72					
CO2	H 1.7		H 1.7	H 1.7			H 1.7	
CO3	H 1.72		H 1.72	H 1.72	H 1.72		H 1.72	
CO4	H 1.8		H 1.8	H 1.8			H 1.8	
CO5	H 1.8		H 1.8	H 1.8				H 1.8
AVERAGE OF COS FOR POS	1.748		1.748	1.755	1.72		1.74	1.8
AVERAGE OF POS	1.7536		1.7536	1.755	1.72		1.74	1.8
AVERAGE	1.7537							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PROBLEM SOLVING & PROGRAMMING IN C

COURSE CODE: BS21104

CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND MACHINE LEARNING

Programme Outcomes – (B. Sc.)

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.
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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 OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

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

Table 1: CO, PO, PSO MAPPING

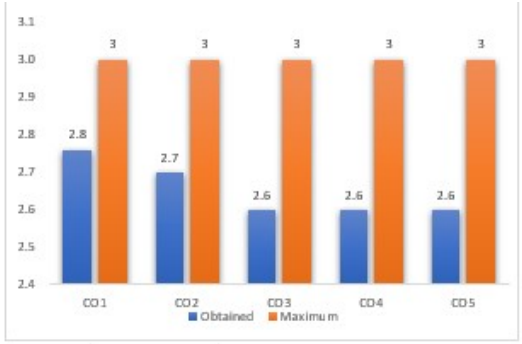
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H	H	H		H		H	H	H		H	H
C02	H	H	H		H		H	H	H		H	H
C03	H	H	H		H		H	H	H		H	H
C04	H	H	H		H		H	H	H		H	H
C05	H	H	H		H		H	H	H		H	H

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	78.0	2.0			100.0	3.0	100.0	3.0	100.0	3.0	72.0	1.0	2.4	88.0	3.0	3.0	2.8
CO2	78.0	2.0			100.0	3.0			100.0	3.0	72.0	1.0	2.3	88.0	3.0	3.0	2.7
CO3	78.0	2.0	70.0	1.0	100.0	3.0			100.0	3.0	72.0	1.0	2.0	88.0	3.0	3.0	2.6
CO4			70.0	1.0	100.0	3.0			100.0	3.0	72.0	1.0	2.0	88.0	3.0	3.0	2.6
CO5			70.0	1.0	100.0	3.0			100.0	3.0	72.0	1.0	2.0	88.0	3.0	3.0	2.6

AVERAGE	AVERAGE
3	2.652

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 second midsemester exam needs to improve to increase 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		H 2.76		H 2.76	H 2.76
CO2	H 2.7	H 2.7	H 2.7		H 2.7		H 2.7	H 2.7
CO3	H 2.6	H 2.6	H 2.6		H 2.6		H 2.6	H 2.6
CO4	H 2.6	H 2.6	H 2.6		H 2.6		H 2.6	H 2.6
CO5	H 2.6	H 2.6	H 2.6		H 2.6		H 2.6	H 2.6
AVERAGE OF COS FOR POS	2.652	2.652	2.652		2.652		2.652	2.652
AVERAGE OF POS	2.6304	2.6304	2.6304		2.6304		2.6304	2.6304
AVERAGE	2.6304							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: BASIC ELECTRONICS & CIRCUITS

COURSE CODE: CSML23103

CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND MACHINE LEARNING

Programme Outcomes – (B. Sc.)

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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Able to Understand what is electronics and terms related to it?	II (UNDERSTAND)
CO2	**CO2:** Understanding the passive components and their connections, sources & laws	II (UNDERSTAND)
CO3	**CO3:** Understanding the fundamentals of alternating current and terminology	II (UNDERSTAND)
CO4	**CO4:**Analyze semiconductors and understand the working of a diode and its applications.	IV(ANALYZE)
CO5	**CO5:** Able to understand the construction and working of transistor, power supply.	II (UNDERSTAND)

Table 1: CO, PO, PSO MAPPING

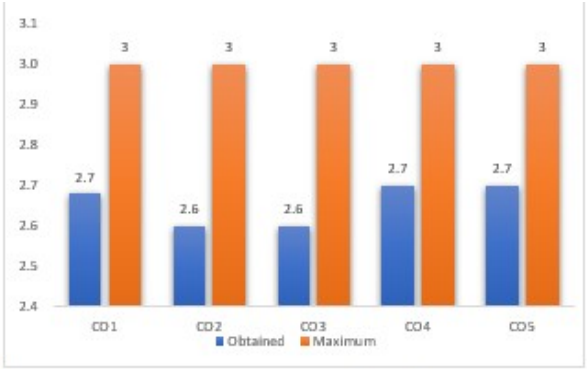
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H	H	H		H		H		H		H	H
C02	H	H	H		H		H		H		H	H
C03	H	H	H		H		H		H		H	H
C04	H	H	H		H		H		H		H	H
C05	H	H	H		H		H		H		H	H

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	70.0	1.0			100.0	3.0	100.0	3.0	100.0	3.0	66.0	1.0	2.2	86.0	3.0	3.0	2.7
CO2	70.0	1.0			100.0	3.0			100.0	3.0	66.0	1.0	2.0	86.0	3.0	3.0	2.6
CO3	70.0	1.0	80.0	2.0	100.0	3.0			100.0	3.0	66.0	1.0	2.0	86.0	3.0	3.0	2.6
CO4			80.0	2.0	100.0	3.0			100.0	3.0	66.0	1.0	2.3	86.0	3.0	3.0	2.7
CO5			80.0	2.0	100.0	3.0			100.0	3.0	66.0	1.0	2.3	86.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.656

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 first midsemester exam needs to improve to increase 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 2.68	H 2.68	H 2.68		H 2.68		H 2.68	
CO2	H 2.6	H 2.6	H 2.6		H 2.6		H 2.6	
CO3	H 2.6	H 2.6	H 2.6		H 2.6		H 2.6	
CO4	H 2.7	H 2.7	H 2.7		H 2.7		H 2.7	
CO5	H 2.7	H 2.7	H 2.7		H 2.7		H 2.7	
AVERAGE OF COS FOR POS	2.656	2.656	2.656		2.656		2.656	
AVERAGE OF POS	2.6512	2.6512	2.6512		2.6512		2.6512	
AVERAGE	2.6512							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: GENERAL ENGLISH – II

COURSE CODE: EN23201

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

PROGRAMME OUTCOMES – (B. Sc.)

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: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	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.	II (UNDERSTANDING)
CO2	To paraphrase ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.	III (APPLYING)
CO3	To create an understanding on Indian Literature, alongside to develop and chisel their communication skills.	II (UNDERSTANDING)
CO4	To recognize the moral element which underlies in the short story; an exposure to informal language.	IV (ANALYSING)
CO5	To develop listening and speaking skills through effective sentence constructions and efficient delivery.	III (APPLYING)

Table 1: CO, PO, PSO MAPPING

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

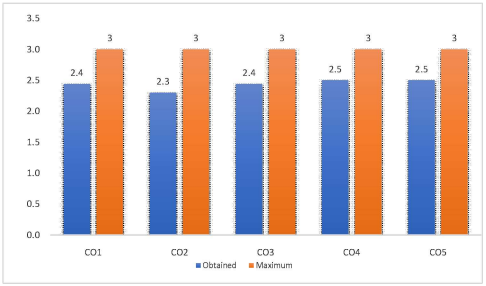
H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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)

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	70.8	1.0			100.0	3.0	93.8	3.0	72.9	1.0	52.1	0.0	1.6	97.9	3.0	3.0	2.4
CO2	70.8	1.0			100.0	3.0			72.9	1.0	52.1	0.0	1.3	97.9	3.0	3.0	2.3
CO3	70.8	1.0	85.4	3.0	100.0	3.0			72.9	1.0	52.1	0.0	1.6	97.9	3.0	3.0	2.4
CO4			85.4	3.0	100.0	3.0			72.9	1.0	52.1	0.0	1.8	97.9	3.0	3.0	2.5
CO5			85.4	3.0	100.0	3.0			72.9	1.0	52.1	0.0	1.8	97.9	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.436

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								
CO2							H 2.3	
CO3			H 2.44				H 2.44	
CO4							H 2.5	
CO5								
AVERAGE OF COS FOR POS			2.44				2.413333333	
AVERAGE OF POS			2.44				2.413333	
AVERAGE	2.426666667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Indian Heritage and Culture

COURSE CODE: IC23201

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

PROGRAMME OUTCOMES – (B. Sc.)

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: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Student will have knowledge about Indian Customs and Traditions.	II (UNDERSTANDING)
CO2	Student can make use of the subject knowledge to attempt all kinds of competitive especially civil services.	III (APPLYING)
CO3	The Subject helps the student community to have knowledge of historical and contemporary social, religious and political issues of the nation.	IV (ANALYZING)

Table 1: CO, PO, PSO MAPPING

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

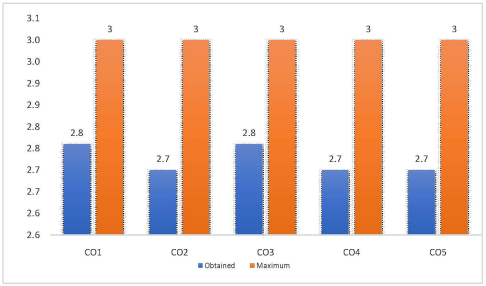
H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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)

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	91.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	52.1	0.0	2.4	91.7	3.0	3.0	2.8
CO2	91.7	3.0			100.0	3.0			100.0	3.0	52.1	0.0	2.3	91.7	3.0	3.0	2.7
CO3	91.7	3.0	93.8	3.0	100.0	3.0			100.0	3.0	52.1	0.0	2.4	91.7	3.0	3.0	2.8
CO4			93.8	3.0	100.0	3.0			100.0	3.0	52.1	0.0	2.3	91.7	3.0	3.0	2.7
CO5			93.8	3.0	100.0	3.0			100.0	3.0	52.1	0.0	2.3	91.7	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

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			H 2.7
CO3		H 2.76			H 2.76			
CO4								
CO5								
AVERAGE OF COS FOR POS		2.74			2.74			2.73
AVERAGE OF POS		2.733333			2.733333			2.715
AVERAGE	2.727222222							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Probability & Statistics for ML

COURSE CODE: CSML23201

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

PROGRAMME OUTCOMES – (B. Sc.)

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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contexts and for sustainable development.

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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: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Understand the importance of descriptive statistics and use the probability theory in case of uncertain situations.	II (UNDERSTANDING)
CO2	Employee the principle of linear regression with an understanding of correlation between two or more than two variables.	III (APPLYING)
CO3	Use discrete and continuous probability distribution, including the requirements and making decisions.	III (APPLYING)
CO4	Knowledge about formulating and testing of hypothesis, using critical values to draw conclusions and determine the probability of making errors in hypothesis test for large sample tests.	IV (ANALYSING)
CO5	Understand and analyze various small sample tests.	IV (ANALYSING)

Table 1: CO, PO, PSO MAPPING

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

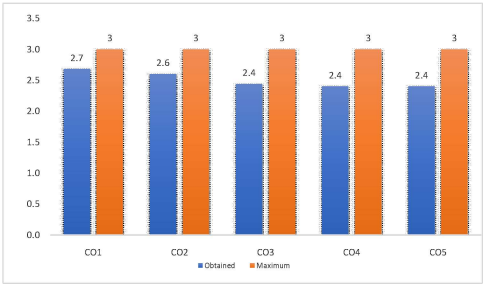
H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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)

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	79.2	2.0			100.0	3.0	100.0	3.0	100.0	3.0	50.0	0.0	2.2	93.8	3.0	3.0	2.7
CO2	79.2	2.0			100.0	3.0			100.0	3.0	50.0	0.0	2.0	93.8	3.0	3.0	2.6
CO3	79.2	2.0	54.2	0.0	100.0	3.0			100.0	3.0	50.0	0.0	1.6	93.8	3.0	3.0	2.4
CO4			54.2	0.0	100.0	3.0			100.0	3.0	50.0	0.0	1.5	93.8	3.0	3.0	2.4
CO5			54.2	0.0	100.0	3.0			100.0	3.0	50.0	0.0	1.5	93.8	3.0	3.0	2.4

AVERAGE	AVERAGE
3	2.504

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 2.68	H 2.68	H 2.68			H 2.68		
CO2	H 2.6	H 2.6	H 2.6			H 2.6		H 2.6
CO3	H 2.44	H 2.44	H 2.44	H 2.44		H 2.44		H 2.44
CO4	H 2.4		H 2.4	H 2.4		H 2.4		H 2.4
CO5	H 2.4		H 2.4	H 2.4		H 2.4		H 2.4
AVERAGE OF COS FOR POS	2.504	2.573333333	2.504	2.413333333		2.504		2.46
AVERAGE OF POS	2.4688	2.537778	2.4688	2.413333		2.4688		2.46
AVERAGE	2.469585185							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Vector Calculus and Number Theory

COURSE CODE: CSML23202

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

PROGRAMME OUTCOMES – (B. Sc.)

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: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Understand the derivatives and partial derivatives to apply on vector functions.	II (UNDERSTANDING)
CO2	Use the Gradient operator to find the directional derivative of scalar functions.	III (APPLYING)
CO3	Understand the various integration theorems relating to line, surface, and volume integrals.	II (UNDERSTANDING)
CO4	Enhance the domain knowledge of number theory and acquire the ability to apply number theory algorithms and procedures to basic problems.	IV (ANALYSING)
CO5	Get acquainted with the linear Congruences and significant theorems in Number theory.	III (APPLYING)

Table 1: CO, PO, PSO MAPPING

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

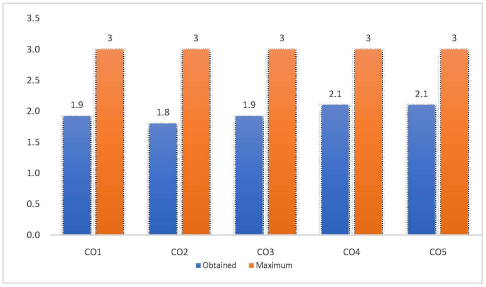
H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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)

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	37.5	0.0			100.0	3.0	100.0	3.0	100.0	3.0	56.3	0.0	1.8	77.1	2.0	2.0	1.9
CO2	37.5	0.0			100.0	3.0			100.0	3.0	56.3	0.0	1.5	77.1	2.0	2.0	1.8
CO3	37.5	0.0	89.6	3.0	100.0	3.0			100.0	3.0	56.3	0.0	1.8	77.1	2.0	2.0	1.9
CO4			89.6	3.0	100.0	3.0			100.0	3.0	56.3	0.0	2.3	77.1	2.0	2.0	2.1
CO5			89.6	3.0	100.0	3.0			100.0	3.0	56.3	0.0	2.3	77.1	2.0	2.0	2.1

AVERAGE	AVERAGE
2	1.968

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 1.92		H 1.92	H 1.92				H 1.92
CO2	H 1.8	H 1.8	H 1.8	H 1.8				H 1.8
CO3	H 1.92		H 1.92	H 1.92				H 1.92
CO4	H 2.1	H 2.1	H 2.1	H 2.1				H 2.1
CO5	H 2.1	H 2.1	H 2.1	H 2.1				H 2.1
AVERAGE OF COS FOR POS	1.968	2	1.968	1.968				1.968
AVERAGE OF POS	1.9776	2	1.9776	1.9776				1.9776
AVERAGE	1.98208							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Fundamentals of Data Structures through C

COURSE CODE: CSML23203

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

PROGRAMME OUTCOMES – (B. Sc.)

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: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Choose appropriate data structures to represent data items in real world problems	II (UNDERSTANDING)
CO2	Illustrate non-linear data structures like linked list	II (UNDERSTANDING)
CO3	Organize the data using sorting in various linear data structures and determine time complexity	III (APPLYING)
CO4	Construct data with nonlinear data structure using trees.	III (APPLYING)
CO5	Explain the concept of graphs and b trees.	III (APPLYING)

Table 1: CO, PO, PSO MAPPING

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

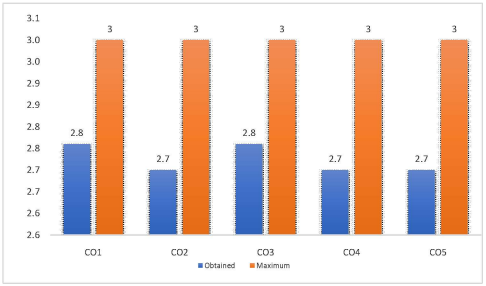
H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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)

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	85.4	3.0			100.0	3.0	100.0	3.0	100.0	3.0	52.1	0.0	2.4	85.4	3.0	3.0	2.8
CO2	85.4	3.0			100.0	3.0			100.0	3.0	52.1	0.0	2.3	85.4	3.0	3.0	2.7
CO3	85.4	3.0	97.9	3.0	100.0	3.0			100.0	3.0	52.1	0.0	2.4	85.4	3.0	3.0	2.8
CO4			97.9	3.0	100.0	3.0			100.0	3.0	52.1	0.0	2.3	85.4	3.0	3.0	2.7
CO5			97.9	3.0	100.0	3.0			100.0	3.0	52.1	0.0	2.3	85.4	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

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	H 2.76		H 2.76		H 2.76
CO2	H 2.7	H 2.7	H 2.7	H 2.7		H 2.7		H 2.7
CO3	H 2.76	H 2.76	H 2.76	H 2.76		H 2.76		H 2.76
CO4	H 2.7	H 2.7	H 2.7	H 2.7		H 2.7		H 2.7
CO5	H 2.7	H 2.7	H 2.7	H 2.7		H 2.7		H 2.7
AVERAGE OF COS FOR POS	2.724	2.724	2.724	2.724		2.724		2.724
AVERAGE OF POS	2.7168	2.7168	2.7168	2.7168		2.7168		2.7168
AVERAGE	2.7168							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Python Programming

COURSE CODE: CSML23204

CREDITS: 3

DEPARTMENT: B. SC. COMPUTER SCIENCE & MACHINE LEARNING

PROGRAMME OUTCOMES – (B. Sc.)

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.

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

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PO8. Life-long learning: Recognize 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: Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.

PSO2: Be able to design and implement various machine learning algorithms in a range of real – world applications.

PSO3: implement problem solving skills in the broad area of programming concepts and manage different projects in interdisciplinary field. Ability to understand and adapt to the contemporary trends and best practices of industry and research standards.

PSO4: Ability to design and implement ethical sustainable solutions with a cutting-edge combination of Artificial Intelligence, Machine Learning, Natural Language Processing etc.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Explain the basics of Python Programming constructs.	II (UNDERSTANDING)
CO2	Sub divides larger problems into smaller ones using functions	III (APPLYING)
CO3	Apply various data structures problem-solving	III (APPLYING)
CO4	Construct Python programs as a set of objects.	IV (ANALYZING0
CO5	Select an appropriate exception handling depending on application and design file operations and Concurrent programming using Python standard library.	IV (ANALYZING0

Table 1: CO, PO, PSO MAPPING

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

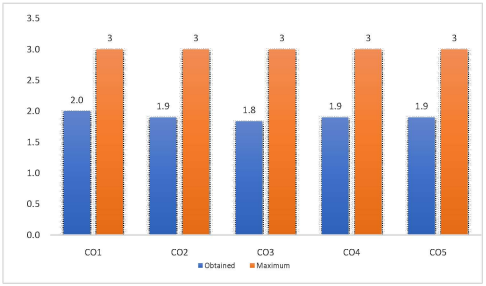
H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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)

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	68.8	1.0			100.0	3.0	100.0	3.0	100.0	3.0	50.0	0.0	2.0	79.2	2.0	2.0	2.0
CO2	68.8	1.0			100.0	3.0			100.0	3.0	50.0	0.0	1.8	79.2	2.0	2.0	1.9
CO3	68.8	1.0	70.8	1.0	100.0	3.0			100.0	3.0	50.0	0.0	1.6	79.2	2.0	2.0	1.8
CO4			70.8	1.0	100.0	3.0			100.0	3.0	50.0	0.0	1.8	79.2	2.0	2.0	1.9
CO5			70.8	1.0	100.0	3.0			100.0	3.0	50.0	0.0	1.8	79.2	2.0	2.0	1.9

AVERAGE	AVERAGE
2	1.908

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	H	2	H	2	H	2		H	2		H	2
CO2	H	1.9	H	1.9	H	1.9	H	1.9		H	1.9		H	1.9
CO3	H	1.84	H	1.84	H	1.84	H	1.84		H	1.84		H	1.84
CO4	H	1.9	H	1.9	H	1.9	H	1.9		H	1.9		H	1.9
CO5	H	1.9	H	1.9	H	1.9	H	1.9		H	1.9		H	1.9
AVERAGE OF COS FOR POS	1.908		1.908		1.908		1.908			1.908			1.908	
AVERAGE OF POS	1.8896		1.8896		1.8896		1.8896			1.8896			1.8896	
AVERAGE	1.8896													