

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: PHYSICS-II

COURSE CODE: CT18203

CREDITS: 3

DEPARTMENT: CHEMICAL TECHNOLOGY

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
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CO1	Explain the fundamentals of vibrations and the concept of Meissner Effect & BCS theory of superconductivity.	III(Apply)
CO2	Compare Damped and forced oscillations and distinguish different types of lasers and its applications.	IV(Analyze)
CO3	A) Distinguish Fresnel's, Fraunhofer diffraction and analyse wavelength of monochromatic light and Grating. B) Analyze ultrasonics to determine velocity of sound in different media.	IV(Analyze)
CO4	Analyze Polarization, Double refraction, optical activity and IV(Analyze) identify its role in designing Nichol's prism, Half-shade polarimeter.	IV(Analyze)
CO5	Apply crystallography principles of solid state physics to explain packing fractions and crystal structures of solids by Laue, Powder diffraction methods.	III(Apply)

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

CHEMICAL TECHNOLOGY

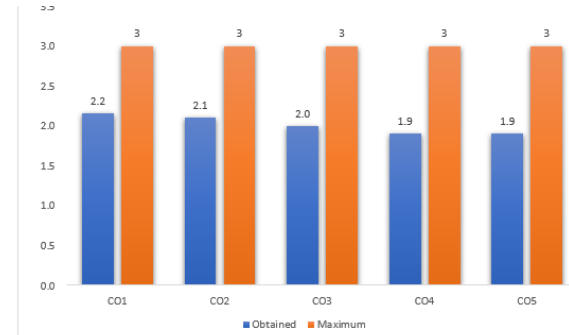
SUBJECT:

PHYSICS-II

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

H: Highly Supportive

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	90.3	3.0			67.7	1.0	93.5	3.0	93.5	3.0	77.4	2.0	2.4	83.9	2.0	2.0	2.2
CO2	90.3	3.0			67.7	1.0			93.5	3.0	77.4	2.0	2.3	83.9	2.0	2.0	2.1
CO3	90.3	3.0	67.7	1.0	67.7	1.0			93.5	3.0	77.4	2.0	2.0	83.9	2.0	2.0	2.0
CO4			67.7	1.0	67.7	1.0			93.5	3.0	77.4	2.0	1.8	83.9	2.0	2.0	1.9
CO5			67.7	1.0	67.7	1.0			93.5	3.0	77.4	2.0	1.8	83.9	2.0	2.0	1.9

AVERAGE	AVERAGE
2	2.012

ATTAINMENT SCALE:

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

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.16	H 2.16	H 2.16			H 2.16	H 2.16	
CO2	H 2.1	H 2.1	H 2.1	H 2.1	H 2.1	H 2.1	H 2.1	
CO3	H 2	H 2	H 2	H 2	H 2	H 2	H 2	H 2
CO4	H 1.9	H 1.9	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	2.012	2.012	2.012	1.975	2	2.012	2.04	1.933333333
AVERAGE OF POS	1.9824	1.9824	1.9824	1.975	2	1.9824	2.01	1.93333
AVERAGE	1.980991667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: PHYSICS-I-I

COURSE CODE: CT18103

CREDITS: 3

DEPARTMENT: CHEMICAL TECHNOLOGY

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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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- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
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CO1	Apply the laws of motion on variable mass systems and explain the conservation principles of mechanical energy and momentum	II(Apply)
CO2	a) Distinguish the mechanics of rigid bodies with respect to kinematics. b) Analyze the principles of interference optics.	IV(Analyze)
CO3	Explain the mechanics of continuous media and solve problems.	III(Apply)
CO4	Categorize different semi-conductors of solids and analyze basic electronics of rectifiers and diodes	IV(Analyze)
CO5	Apply the principles of fibre optics for signal propagation.	III(Apply)

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

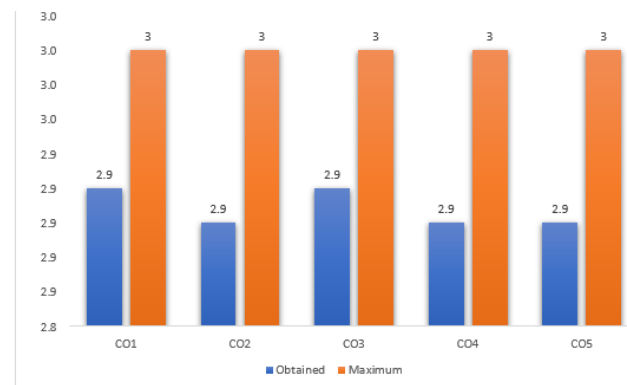
CHEMICAL TECHNOLOGY

SUBJECT:

PHYSICS-I

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

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	96.8	3.0			96.8	3.0	100.0	3.0	100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO2	96.8	3.0			96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO3	96.8	3.0	93.5	3.0	96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO4			93.5	3.0	96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO5			93.5	3.0	96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.908

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 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.92	H 2.92	H 2.92				H 2.92	
CO2	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	
CO3	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92
CO4	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9
CO5	H 2.9	H 2.9	H 2.9	H 2.9		H 2.9		H 2.9
AVERAGE OF COS FOR POS	2.908	2.908	2.908	2.905	2.906666667	2.905	2.91	2.906666667
AVERAGE OF POS	2.9056	2.9056	2.9056	2.905	2.90667	2.905	2.9075	2.90667
AVERAGE	2.905954167							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: PHYSICS-I-I

COURSE CODE: CT18103

CREDITS: 3

DEPARTMENT: CHEMICAL TECHNOLOGY

PROGRAMME OUTCOMES (B.Sc.) Or POs:

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	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
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CO1	Apply the laws of motion on variable mass systems and explain the conservation principles of mechanical energy and momentum	II(Apply)
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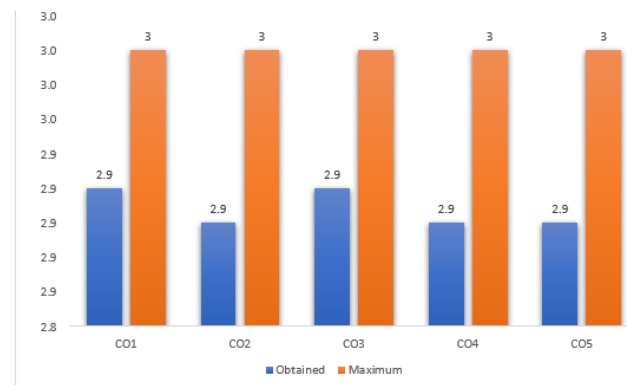
CHEMICAL TECHNOLOGY

SUBJECT:

PHYSICS-I

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

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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
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CO2	96.8	3.0			96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO3	96.8	3.0	93.5	3.0	96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO4			93.5	3.0	96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9
CO5			93.5	3.0	96.8	3.0			100.0	3.0	77.4	2.0	2.8	93.5	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.908

ATTAINMENT SCALE:

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Table 3: PROGRAMME OUTCOME MAPPING



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CO2	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	
CO3	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92
CO4	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9
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AVERAGE OF POS	2.9056	2.9056	2.9056	2.905	2.90667	2.905	2.9075	2.90667
AVERAGE	2.905954167							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Organic Surface Coatings Technology

COURSE CODE: CT18606B

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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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- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
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CO1	Describe the organic surface coatings.	Understand
CO2	Explain pigments and extruders.	Analyze
CO3	Explain resins, plasticizers and additives.	Apply
CO4	Explain paints with reference to testing and applications.	Analyze
CO5	Select coatings for different applications in chemical industries.	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

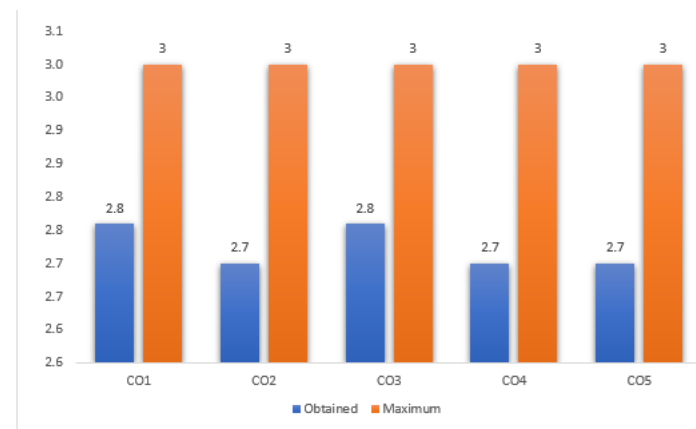
ATTAINMENT SCALE:

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	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	100.0	3.0			89.7	3.0	100.0	3.0	100.0	3.0	53.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	100.0	3.0			89.7	3.0			100.0	3.0	53.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	100.0	3.0	94.9	3.0	89.7	3.0			100.0	3.0	53.8	0.0	2.4	100.0	3.0	3.0	2.8
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CO5			94.9	3.0	89.7	3.0			100.0	3.0	53.8	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Organic Surface Coatings Technology

COURSE CODE: CT18606B

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

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	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Describe the organic surface coatings.	Understand
CO2	Explain pigments and extruders.	Analyze
CO3	Explain resins, plasticizers and additives.	Apply
CO4	Explain paints with reference to testing and applications.	Analyze
CO5	Select coatings for different applications in chemical industries.	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

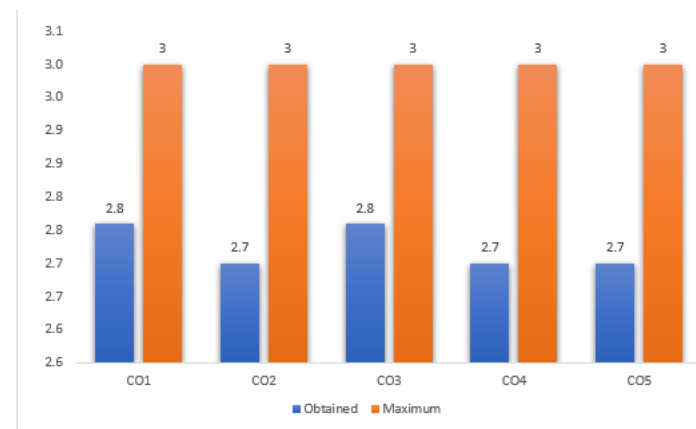
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	100.0	3.0			89.7	3.0	100.0	3.0	100.0	3.0	53.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	100.0	3.0			89.7	3.0			100.0	3.0	53.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	100.0	3.0	94.9	3.0	89.7	3.0			100.0	3.0	53.8	0.0	2.4	100.0	3.0	3.0	2.8
CO4			94.9	3.0	89.7	3.0			100.0	3.0	53.8	0.0	2.3	100.0	3.0	3.0	2.7
CO5			94.9	3.0	89.7	3.0			100.0	3.0	53.8	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Non-Conventional Energy Sources

COURSE CODE: CT18605A

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Describe different types of energy sources. Describe method for estimating solar radiation.	Understand
CO2	Identify solar energy storage systems. Explain applications of solar energy.	Analyze
CO3	Describe production of electrical energy from wind energy. Describe generation of energy from biomass.	Analyze
CO4	Describe production of electrical energy from geothermal energy. Describe classification of geothermal fields.	Analyze
CO5	Describe production of electrical energy fuel cells. Describe production of energy from hydrogen.	Apply & Analyze

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

Chemical Technology

SUBJECT:

Non-Conventioanal Energy Sources

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

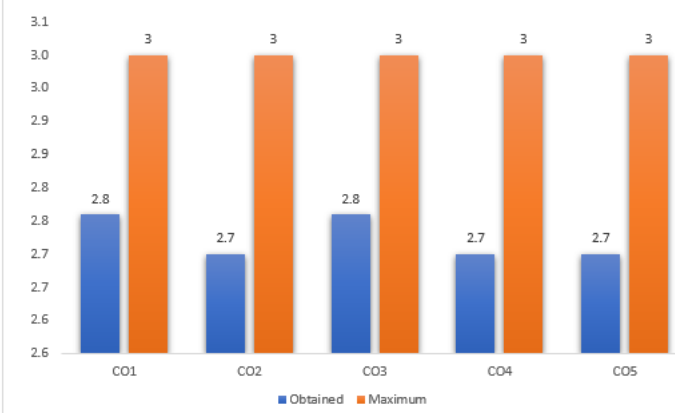
ATTAINMENT SCALE:

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	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		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			97.4	3.0	100.0	3.0	100.0	3.0	51.3	0.0	2.4	100.0	3.0	3.0	2.8
CO2	100.0	3.0			97.4	3.0			100.0	3.0	51.3	0.0	2.3	100.0	3.0	3.0	2.7
CO3	100.0	3.0	94.9	3.0	97.4	3.0			100.0	3.0	51.3	0.0	2.4	100.0	3.0	3.0	2.8
CO4			94.9	3.0	97.4	3.0			100.0	3.0	51.3	0.0	2.3	100.0	3.0	3.0	2.7
CO5			94.9	3.0	97.4	3.0			100.0	3.0	51.3	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Mass Transfer Operations-II

COURSE CODE: CT18601

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Explain the principle and applications of absorption and will be able to design packed column	Analyze
CO2	Describe humidity and its measurement and equipment for humidification operations	Understand
CO3	Choose drying equipment and will be able to do calculations in drying	Apply
CO4	Choose suitable equipment to carry out adsorption	Apply
CO5	Explain membrane separation process and will be able to classify membranes	Understand

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

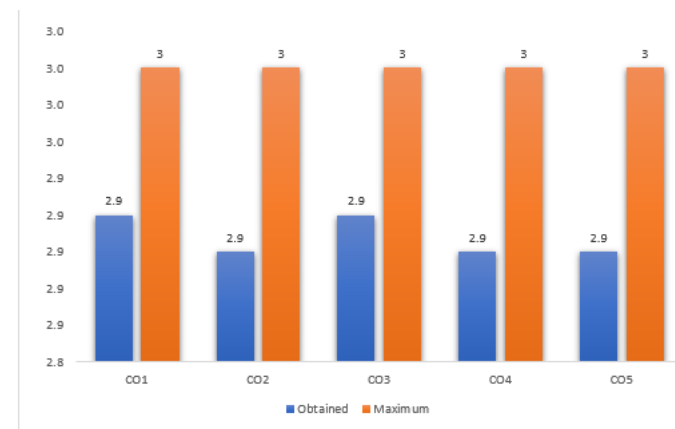
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	94.9	3.0			94.9	3.0	100.0	3.0	100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO2	94.9	3.0			94.9	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO3	94.9	3.0	97.4	3.0	94.9	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO4			97.4	3.0	94.9	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO5			97.4	3.0	94.9	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.908

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.92	H 2.92	H 2.92					
CO2	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	H 2.9	
CO3	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	
CO4	H 2.9	H 2.9	H 2.9	H 2.9		H 2.9	H 2.9	
CO5	H 2.9	H 2.9	H 2.9	H 2.9		H 2.9		H 2.9
AVERAGE OF COS FOR POS	2.908	2.908	2.908	2.905	2.91	2.905	2.90666667	2.9
AVERAGE OF POS	2.9056	2.9056	2.9056	2.905	2.91	2.905	2.906667	2.9
AVERAGE	2.905433333							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Mass Transfer Operations-I

COURSE CODE: CT18501

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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:** Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Describe the principles of diffusion	Understand
CO2	Explain the principle of distillation and types of distillation	Analyze
CO3	Analysis of fractionating column by McCabe Thiele Method	Apply
CO4	Explain the principle and applications of Leaching process	Apply
CO5	Explain the principles of extraction and extraction equipment	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

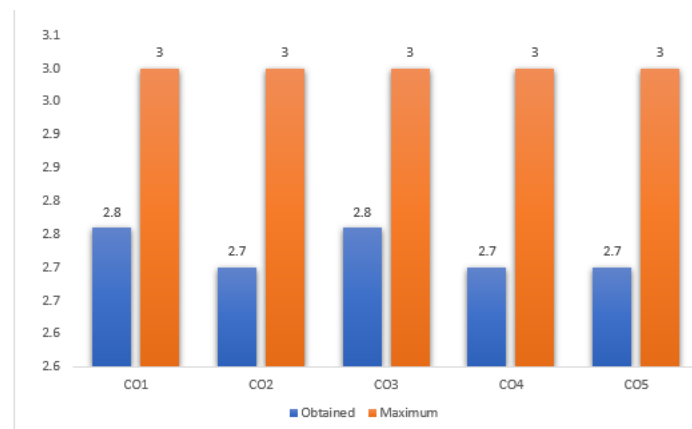
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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			97.4	3.0	100.0	3.0	100.0	3.0	38.5	0.0	2.4	97.4	3.0	3.0	2.8
CO2	100.0	3.0			97.4	3.0			100.0	3.0	38.5	0.0	2.3	97.4	3.0	3.0	2.7
CO3	100.0	3.0	100.0	3.0	97.4	3.0			100.0	3.0	38.5	0.0	2.4	97.4	3.0	3.0	2.8
CO4			100.0	3.0	97.4	3.0			100.0	3.0	38.5	0.0	2.3	97.4	3.0	3.0	2.7
CO5			100.0	3.0	97.4	3.0			100.0	3.0	38.5	0.0	2.3	97.4	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Mass Transfer Operations-I

COURSE CODE: CT18501

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
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- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Describe the principles of diffusion	Understand
CO2	Explain the principle of distillation and types of distillation	Analyze
CO3	Analysis of fractionating column by McCabe Thiele Method	Apply
CO4	Explain the principle and applications of Leaching process	Apply
CO5	Explain the principles of extraction and extraction equipment	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

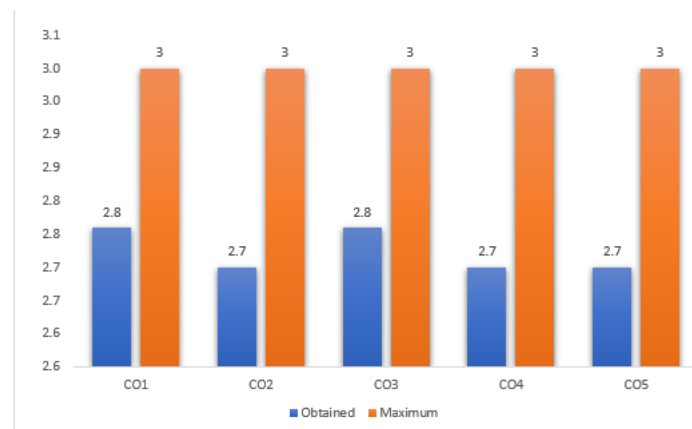
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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			97.4	3.0	100.0	3.0	100.0	3.0	38.5	0.0	2.4	97.4	3.0	3.0	2.8
CO2	100.0	3.0			97.4	3.0			100.0	3.0	38.5	0.0	2.3	97.4	3.0	3.0	2.7
CO3	100.0	3.0	100.0	3.0	97.4	3.0			100.0	3.0	38.5	0.0	2.4	97.4	3.0	3.0	2.8
CO4			100.0	3.0	97.4	3.0			100.0	3.0	38.5	0.0	2.3	97.4	3.0	3.0	2.7
CO5			100.0	3.0	97.4	3.0			100.0	3.0	38.5	0.0	2.3	97.4	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Instrumentation and Process Control

COURSE CODE: CT18405

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Explain the qualities of measurement and Choose a suitable thermometer for a given application	Understand
CO2	Describe the methods for composition analysis of moisture in gases	Analyze
CO3	Explain various pressure and vacuum measurement instruments and process instrumentation	Analyze
CO4	Describe the role of process dynamics and control	Apply
CO5	Describe controllers and final controller elements	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

Chemical Technology

SUBJECT:

Instrumentation and Process Control

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

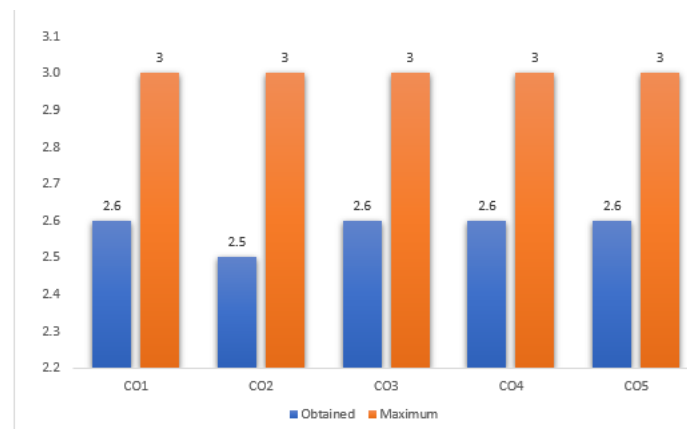
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	79.5	2.0			94.9	3.0	94.9	3.0	82.1	2.0	41.0	0.0	2.0	89.7	3.0	3.0	2.6
CO2	79.5	2.0			94.9	3.0			82.1	2.0	41.0	0.0	1.8	89.7	3.0	3.0	2.5
CO3	79.5	2.0	94.9	3.0	94.9	3.0			82.1	2.0	41.0	0.0	2.0	89.7	3.0	3.0	2.6
CO4			94.9	3.0	94.9	3.0			82.1	2.0	41.0	0.0	2.0	89.7	3.0	3.0	2.6
CO5			94.9	3.0	94.9	3.0			82.1	2.0	41.0	0.0	2.0	89.7	3.0	3.0	2.6

AVERAGE	AVERAGE
3	2.58

Table 3: PROGRAMME OUTCOME MAPPING



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	H 2.5	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	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	2.58	2.58	2.58	2.575	2.55	2.575	2.56666667	2.6
AVERAGE OF POS	2.576	2.576	2.576	2.575	2.55	2.575	2.566667	2.6
AVERAGE	2.574333333							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Fluid Mechanics

COURSE CODE: CT18404

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
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CO1	Understand of basic unit and dimensions in fluid mechanics. Describe basic principles of fluid mechanic	Understand
CO2	Identify fluid flow problems with the application of the momentum and energy equations. Describe friction and losses in fluid flows.	Analyze
CO3	Analyze pressure drops in packed bed. Knowledge of fluidization	Analyze & Apply
CO4	Measure flow. Knowledge of flow meters.	Apply
CO5	Describe piping layout. Describe equipment's in transportation of fluids	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

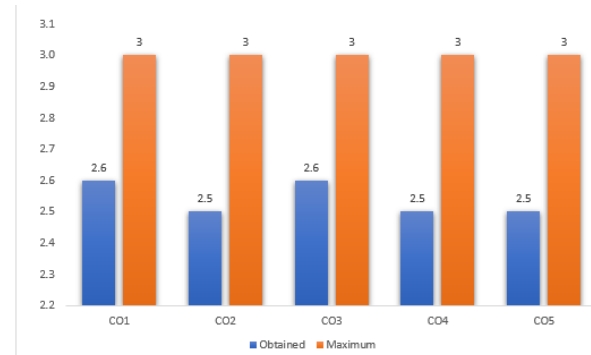
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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			72.4	1.0	100.0	3.0	100.0	3.0	62.1	0.0	2.0	96.6	3.0	3.0	2.6
CO2	100.0	3.0			72.4	1.0			100.0	3.0	62.1	0.0	1.8	96.6	3.0	3.0	2.5
CO3	100.0	3.0	86.2	3.0	72.4	1.0			100.0	3.0	62.1	0.0	2.0	96.6	3.0	3.0	2.6
CO4			86.2	3.0	72.4	1.0			100.0	3.0	62.1	0.0	1.8	96.6	3.0	3.0	2.5
CO5			86.2	3.0	72.4	1.0			100.0	3.0	62.1	0.0	1.8	96.6	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.54

Table 3: PROGRAMME OUTCOME MAPPING



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	H 2.5	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	H 2.6	H 2.6	
CO4	H 2.5	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		H 2.5
AVERAGE OF COS FOR POS	2.54	2.54	2.54	2.525	2.55	2.525	2.53333333	2.5
AVERAGE OF POS	2.528	2.528	2.528	2.525	2.55	2.525	2.533333	2.5
AVERAGE	2.527166667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ENVIRONMENTAL STUDIES & GENDER SENSITIZATION

COURSE CODE: ES18201

CREDITS: 3

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Understand the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity.	Understand
CO2	Understand the pollution problems and apply the environmental science knowledge on solid waste management, disaster management.	Understand
CO3	Apply the environmental science knowledge to improve the resources Evaluate and understand the sustainable environmental conditions and control methods.	Analyse
CO4	Identify the interactions and inter sections 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	Understand & Analyse
CO5	Understand the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislation	Understand & Analyse

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

Chemical Technology

SUBJECT:

ENVIRONMENTAL STUDIES & GENDER SENSITIZATION

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

H: Highly Supportive
S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

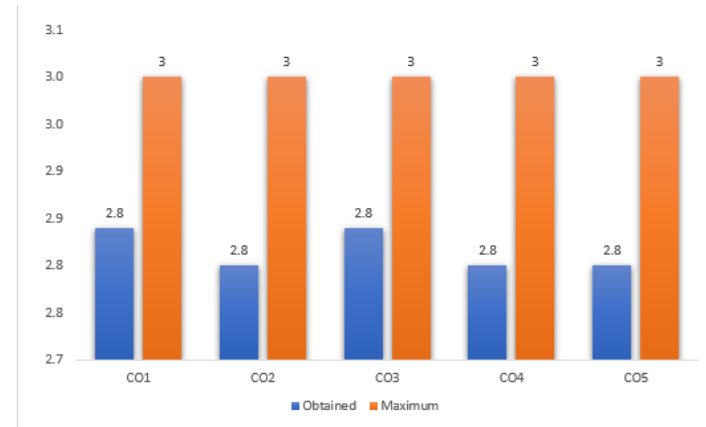
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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			93.1	3.0	100.0	3.0	100.0	3.0	65.5	1.0	2.6	100.0	3.0	3.0	2.8
CO2	100.0	3.0			93.1	3.0			100.0	3.0	65.5	1.0	2.5	100.0	3.0	3.0	2.8
CO3	100.0	3.0	96.6	3.0	93.1	3.0			100.0	3.0	65.5	1.0	2.6	100.0	3.0	3.0	2.8
CO4			96.6	3.0	93.1	3.0			100.0	3.0	65.5	1.0	2.5	100.0	3.0	3.0	2.8
CO5			96.6	3.0	93.1	3.0			100.0	3.0	65.5	1.0	2.5	100.0	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.816

Table 3: PROGRAMME OUTCOME MAPPING



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	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	H 2.84	H 2.84	
CO4	H 2.8	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		H 2.8
AVERAGE OF COS FOR POS	2.816	2.816	2.816	2.81	2.82	2.81	2.81333333	2.8
AVERAGE OF POS	2.8112	2.8112	2.8112	2.81	2.82	2.81	2.813333	2.8
AVERAGE	2.810866667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ENVIRONMENTAL ENGINEERING AND SAFETY

COURSE CODE: CT18604

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Classify the industrial effluents and Oxygen Demands.	Understand
CO2	Select a suitable equipment and treatment process to control pollution caused by industrial liquid wastes.	Analyse

CO3	Select a suitable equipment and treatment process to control pollution caused by industrial gaseous effluents and solid waste.	Apply
CO4	Explain the safety aspects of a chemical industry such as hazards involved in the chemical industry and preventive measures to be taken.	Analyse
CO5	Identify the effects of toxic agents on human health and will be able to understand how to handle flammable materials in chemical industries	Apply

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

Chemical Technology

SUBJECT:

Environmental engineering & Safety

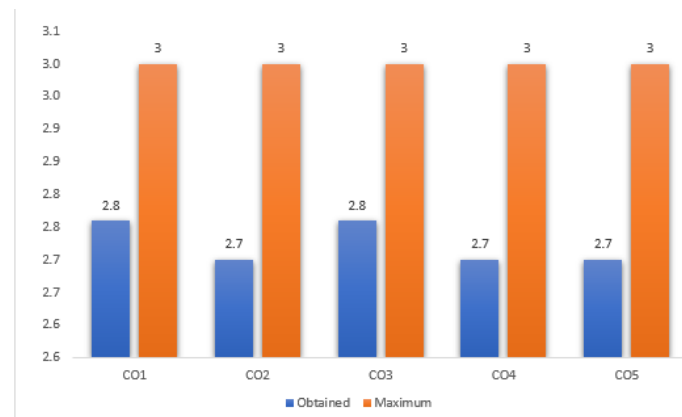
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H	H	H	S	S	S	S	S	H	S	S	H
C02	H	H	H	H	H	H	H	S	H	H	H	H
C03	H	H	H	H	H	H	H	S	H	H	H	H
C04	H	H	H	H	S	H	H	S	H	H	H	S
C05	H	H	H	H	S	H	S	H	H	H	H	H

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



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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			87.2	3.0	100.0	3.0	100.0	3.0	51.3	0.0	2.4	100.0	3.0	3.0	2.8
CO2	100.0	3.0			87.2	3.0			100.0	3.0	51.3	0.0	2.3	100.0	3.0	3.0	2.7
CO3	100.0	3.0	87.2	3.0	87.2	3.0			100.0	3.0	51.3	0.0	2.4	100.0	3.0	3.0	2.8
CO4			87.2	3.0	87.2	3.0			100.0	3.0	51.3	0.0	2.3	100.0	3.0	3.0	2.7
CO5			87.2	3.0	87.2	3.0			100.0	3.0	51.3	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY V

COURSE CODE: CT18504

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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.
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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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Determine the extraction, structure and uses of alkaloids, terpenoids, steroids and dye stuffs	Understand
CO2	Application of polymers, development of polymers and rubbers	Analyze
CO3	Drug classification and drug action	Apply
CO4	Concepts of spectroscopic techniques	Apply
CO5	Evaluate order and molecularity of reactions, application of photochemical reactions	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

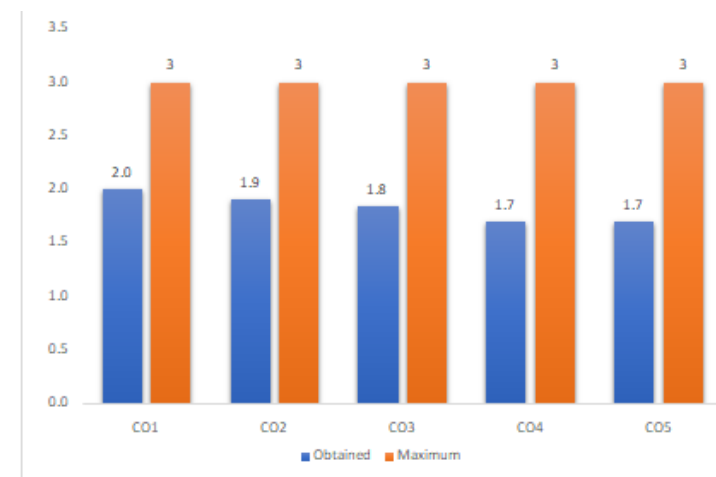
SUBJECT:

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

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

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



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	97.6	3.0			68.3	1.0	100.0	3.0	100.0	3.0	17.1	0.0	2.0	80.5	2.0	2.0	2.0
CO2	97.6	3.0			68.3	1.0			100.0	3.0	17.1	0.0	1.8	80.5	2.0	2.0	1.9
CO3	97.6	3.0	70.7	1.0	68.3	1.0			100.0	3.0	17.1	0.0	1.6	80.5	2.0	2.0	1.8
CO4			70.7	1.0	68.3	1.0			100.0	3.0	17.1	0.0	1.3	80.5	2.0	2.0	1.7
CO5			70.7	1.0	68.3	1.0			100.0	3.0	17.1	0.0	1.3	80.5	2.0	2.0	1.7

AVERAGE	AVERAGE
2	1.828

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	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	H 1.9	
CO3	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	
CO4	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7	H 1.7	
CO5	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7		H 1.7
AVERAGE OF COS FOR POS	1.828	1.828	1.828	1.785	1.87	1.785	1.813333333	1.7
AVERAGE OF POS	1.7936	1.7936	1.7936	1.785	1.87	1.785	1.813333	1.7
AVERAGE	1.791766667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Chemical Technology-II

COURSE CODE: CT18503

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
--	-----------------	------------------------

CO1	Explain Nuclear materials	Understand
CO2	Explain natural product industries, soaps, and detergents	Understand
CO3	Describe microware, biotechnology, isolation, cultivation, and growth of micro-organisms	Understand
CO4	Explain pulp and paper industry	Understand
CO5	Explain food industry	Understand

TABLE 1: CO, PO, PSO MAPPING



DEPARTMENT:

SUBJECT:

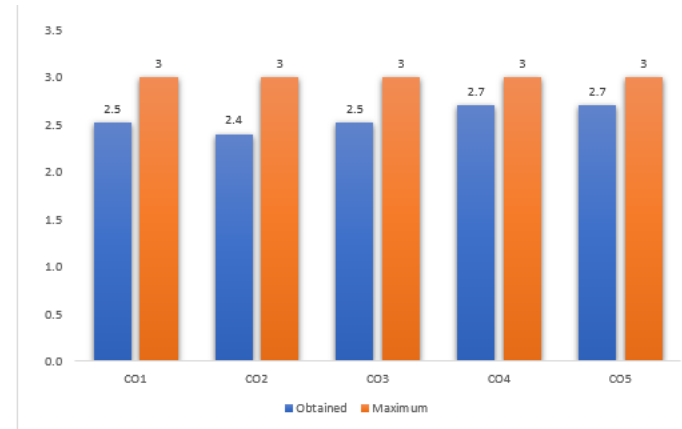
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H	H	H	S	S	S	S	S	H	S	S	H
C02	H	H	H	H	H	H	H	S	H	H	H	H
C03	H	H	H	H	H	H	H	S	H	H	H	H
C04	H	H	H	H	S	H	H	S	H	H	H	S
C05	H	H	H	H	S	H	S	H	H	H	H	H

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	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	5.1	0.0			97.4	3.0	100.0	3.0	100.0	3.0	41.0	0.0	1.8	100.0	3.0	3.0	2.5
CO2	5.1	0.0			97.4	3.0			100.0	3.0	41.0	0.0	1.5	100.0	3.0	3.0	2.4
CO3	5.1	0.0	97.4	3.0	97.4	3.0			100.0	3.0	41.0	0.0	1.8	100.0	3.0	3.0	2.5
CO4			97.4	3.0	97.4	3.0			100.0	3.0	41.0	0.0	2.3	100.0	3.0	3.0	2.7
CO5			97.4	3.0	97.4	3.0			100.0	3.0	41.0	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.568

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.52	H 2.52	H 2.52					
CO2	H 2.4	H 2.4	H 2.4	H 2.4	H 2.4	H 2.4	H 2.4	
CO3	H 2.52	H 2.52	H 2.52	H 2.52	H 2.52	H 2.52	H 2.52	
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	2.568	2.568	2.568	2.58	2.46	2.58	2.54	2.7
AVERAGE OF POS	2.5776	2.5776	2.5776	2.58	2.46	2.58	2.54	2.7
AVERAGE	2.5741							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY IV

COURSE CODE: CT18402

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Compare, preparation and properties of carboxylic acids	Understand
CO2	Synthetic properties of nitro and heterocyclic compounds	Analyze
CO3	Synthesis and analysis of carbohydrates and amino acids	Apply
CO4	Interpret metal complexes based on LFT, CFT, MOT	Apply
CO5	Apply catalyst, reaction mechanism of complexes and OMC	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

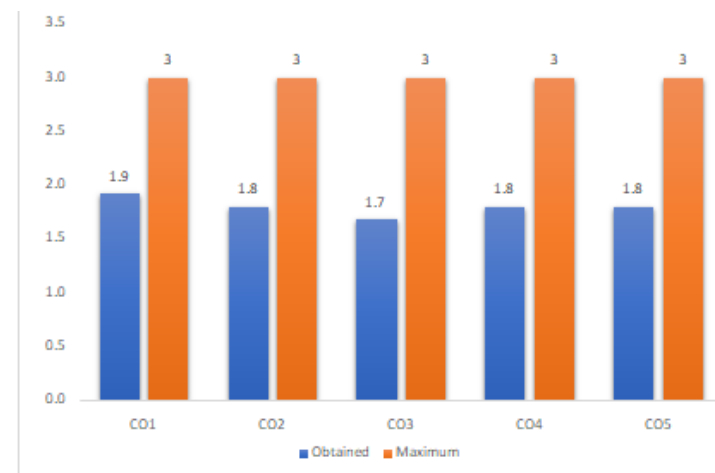
SUBJECT:

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

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

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



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	48.7	0.0			87.2	3.0	100.0	3.0	100.0	3.0	30.8	0.0	1.8	79.5	2.0	2.0	1.9
CO2	48.7	0.0			87.2	3.0			100.0	3.0	30.8	0.0	1.5	79.5	2.0	2.0	1.8
CO3	48.7	0.0	64.1	0.0	87.2	3.0			100.0	3.0	30.8	0.0	1.2	79.5	2.0	2.0	1.7
CO4			64.1	0.0	87.2	3.0			100.0	3.0	30.8	0.0	1.5	79.5	2.0	2.0	1.8
CO5			64.1	0.0	87.2	3.0			100.0	3.0	30.8	0.0	1.5	79.5	2.0	2.0	1.8

AVERAGE	AVERAGE
2	1.8

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	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	H 1.8	H 1.8	
CO3	H 1.68	H 1.68	H 1.68	H 1.68	H 1.68	H 1.68	H 1.68	
CO4	H 1.8	H 1.8	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		H 1.8		H 1.8
AVERAGE OF COS FOR POS	1.8	1.8	1.8	1.77	1.74	1.77	1.76	1.8
AVERAGE OF POS	1.776	1.776	1.776	1.77	1.74	1.77	1.76	1.8
AVERAGE	1.771							

Activate

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY IV

COURSE CODE: CT18402

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Compare, preparation and properties of carboxylic acids	Understand
CO2	Synthetic properties of nitro and heterocyclic compounds	Analyze
CO3	Synthesis and analysis of carbohydrates and amino acids	Apply
CO4	Interpret metal complexes based on LFT, CFT, MOT	Apply
CO5	Apply catalyst, reaction mechanism of complexes and OMC	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

Chemical Technology

SUBJECT:

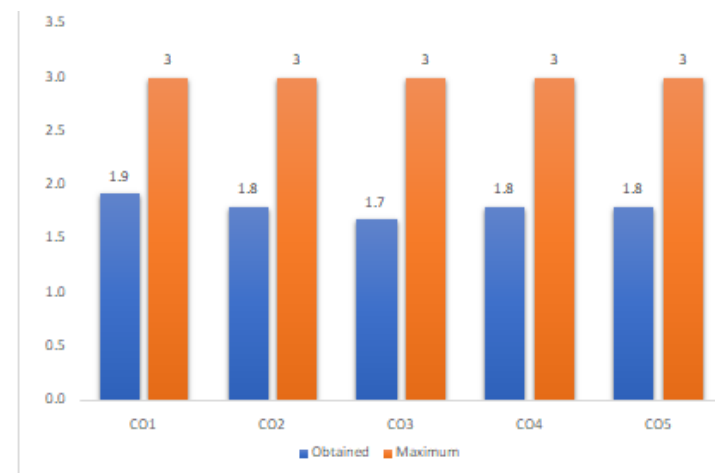
Chemistry IV

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

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

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



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	48.7	0.0			87.2	3.0	100.0	3.0	100.0	3.0	30.8	0.0	1.8	79.5	2.0	2.0	1.9
CO2	48.7	0.0			87.2	3.0			100.0	3.0	30.8	0.0	1.5	79.5	2.0	2.0	1.8
CO3	48.7	0.0	64.1	0.0	87.2	3.0			100.0	3.0	30.8	0.0	1.2	79.5	2.0	2.0	1.7
CO4			64.1	0.0	87.2	3.0			100.0	3.0	30.8	0.0	1.5	79.5	2.0	2.0	1.8
CO5			64.1	0.0	87.2	3.0			100.0	3.0	30.8	0.0	1.5	79.5	2.0	2.0	1.8

AVERAGE	AVERAGE
2	1.8

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	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	H 1.8	H 1.8	
CO3	H 1.68	H 1.68	H 1.68	H 1.68	H 1.68	H 1.68	H 1.68	
CO4	H 1.8	H 1.8	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		H 1.8		H 1.8
AVERAGE OF COS FOR POS	1.8	1.8	1.8	1.77	1.74	1.77	1.76	1.8
AVERAGE OF POS	1.776	1.776	1.776	1.77	1.74	1.77	1.76	1.8
AVERAGE	1.771							

Activate

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY III

COURSE CODE: CT18302

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Explain synthesis and properties of halogens, alcohols, phenols and ethers	Understand
CO2	Compare the synthetic properties of aldehydes and ketones	Analyze
CO3	Preparation and properties of d and f block elements	Apply
CO4	Compare the electrical conductivities of conductors and their related laws	Apply
CO5	Evaluate cell potential, compare electrodes and their functions	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

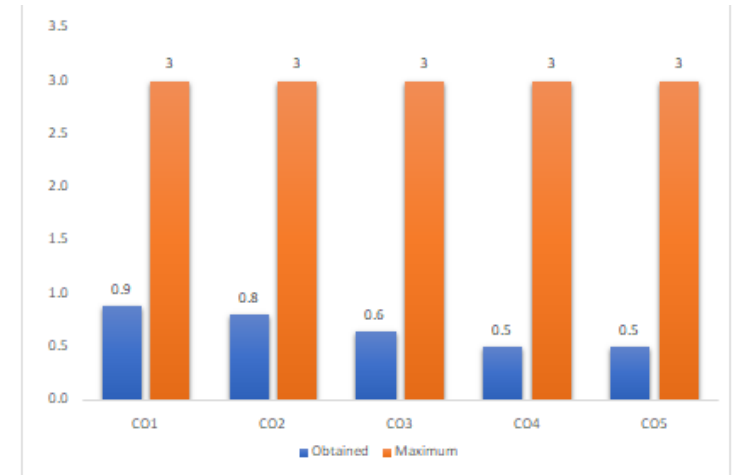
SUBJECT:

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

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

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



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	94.9	3.0			84.6	2.0	100.0	3.0	100.0	3.0	41.0	0.0	2.2	41.0	0.0	0.0	0.9
CO2	94.9	3.0			84.6	2.0			100.0	3.0	41.0	0.0	2.0	41.0	0.0	0.0	0.8
CO3	94.9	3.0	59.0	0.0	84.6	2.0			100.0	3.0	41.0	0.0	1.6	41.0	0.0	0.0	0.6
CO4			59.0	0.0	84.6	2.0			100.0	3.0	41.0	0.0	1.3	41.0	0.0	0.0	0.5
CO5			59.0	0.0	84.6	2.0			100.0	3.0	41.0	0.0	1.3	41.0	0.0	0.0	0.5

AVERAGE	AVERAGE
0	0.664

Table 3: PROGRAMME OUTCOME MAPPING



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	H 0.8	H 0.8	H 0.8	H 0.8	
CO3	H 0.64	H 0.64	H 0.64	H 0.64	H 0.64	H 0.64	H 0.64	
CO4	H 0.5	H 0.5	H 0.5	H 0.5		H 0.5	H 0.5	
CO5	H 0.5	H 0.5	H 0.5	H 0.5		H 0.5		H 0.5
AVERAGE OF COS FOR POS	0.664	0.664	0.664	0.61	0.72	0.61	0.64666667	0.5
AVERAGE OF POS	0.6208	0.6208	0.6208	0.61	0.72	0.61	0.646667	0.5
AVERAGE	0.618633333							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY III

COURSE CODE: CT18302

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Explain synthesis and properties of halogens, alcohols, phenols and ethers	Understand
CO2	Compare the synthetic properties of aldehydes and ketones	Analyze
CO3	Preparation and properties of d and f block elements	Apply
CO4	Compare the electrical conductivities of conductors and their related laws	Apply
CO5	Evaluate cell potential, compare electrodes and their functions	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

SUBJECT:

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

Table 2: COURSE OUTCOME ATTAINMENT

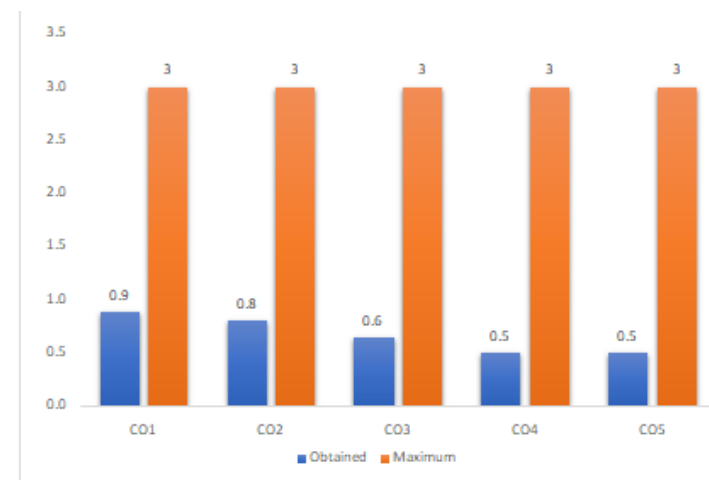
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	94.9	3.0			84.6	2.0	100.0	3.0	100.0	3.0	41.0	0.0	2.2	41.0	0.0	0.0	0.9
CO2	94.9	3.0			84.6	2.0			100.0	3.0	41.0	0.0	2.0	41.0	0.0	0.0	0.8
CO3	94.9	3.0	59.0	0.0	84.6	2.0			100.0	3.0	41.0	0.0	1.6	41.0	0.0	0.0	0.6
CO4			59.0	0.0	84.6	2.0			100.0	3.0	41.0	0.0	1.3	41.0	0.0	0.0	0.5
CO5			59.0	0.0	84.6	2.0			100.0	3.0	41.0	0.0	1.3	41.0	0.0	0.0	0.5

AVERAGE	AVERAGE
0	0.664

Table 3: PROGRAMME OUTCOME MAPPING



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	H 0.8	H 0.8	H 0.8	H 0.8	
CO3	H 0.64	H 0.64	H 0.64	H 0.64	H 0.64	H 0.64	H 0.64	
CO4	H 0.5	H 0.5	H 0.5	H 0.5		H 0.5	H 0.5	
CO5	H 0.5	H 0.5	H 0.5	H 0.5		H 0.5		H 0.5
AVERAGE OF COS FOR POS	0.664	0.664	0.664	0.61	0.72	0.61	0.64666667	0.5
AVERAGE OF POS	0.6208	0.6208	0.6208	0.61	0.72	0.61	0.646667	0.5
AVERAGE	0.618633333							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY II

COURSE CODE: CT18202

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To understand the laws of thermodynamics	Understand
CO2	To understand Gibb's free energy, Claperyon equation and Vant Hoff isotherm	Analyze
CO3	Applying the colligative properties towards osmosis, osmotic potential	Apply
CO4	Real and ideal gases and derivation and relation between various constants	Apply
CO5	Evaluation of analytical data and understanding the phase rule and its applications	Apply

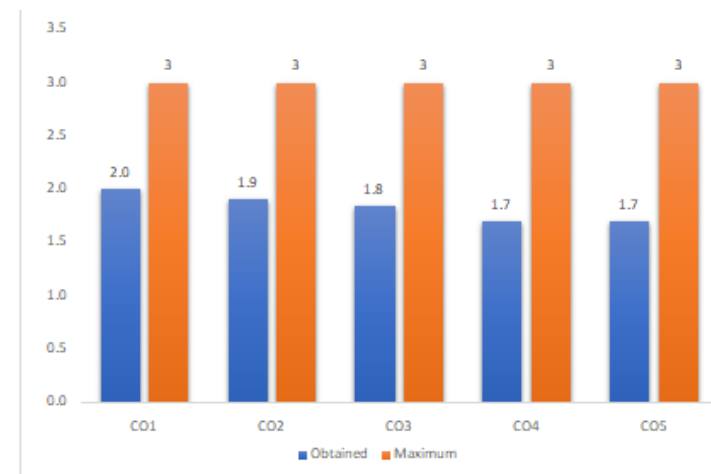
TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

SUBJECT:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
H	H	H	S	S	S	S	S	H	S	S	H
H	H	H	H	H	H	H	S	H	H	H	H
H	H	H	H	H	H	H	S	H	H	H	H
H	H	H	H	S	H	H	S	H	H	H	S
H	H	H	H	S	H	S	H	H	H	H	H

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	93.5	3.0			77.4	2.0	100.0	3.0	77.4	2.0	58.1	0.0	2.0	83.9	2.0	2.0	2.0
CO2	93.5	3.0			77.4	2.0			77.4	2.0	58.1	0.0	1.8	83.9	2.0	2.0	1.9
CO3	93.5	3.0	71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.6	83.9	2.0	2.0	1.8
CO4			71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.3	83.9	2.0	2.0	1.7
CO5			71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.3	83.9	2.0	2.0	1.7

AVERAGE	AVERAGE
2	1.828

ATTAINMENT SCALE:

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

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	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	H 1.9	
CO3	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	
CO4	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7	H 1.7	
CO5	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7		H 1.7
AVERAGE OF COS FOR POS	1.828	1.828	1.828	1.785	1.87	1.785	1.813333333	1.7
AVERAGE OF POS	1.7936	1.7936	1.7936	1.785	1.87	1.785	1.813333	1.7
AVERAGE	1.791766667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY II

COURSE CODE: CT18202

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To understand the laws of thermodynamics	Understand
CO2	To understand Gibb's free energy, Claperyon equation and Vant Hoff isotherm	Analyze
CO3	Applying the colligative properties towards osmosis, osmotic potential	Apply
CO4	Real and ideal gases and derivation and relation between various constants	Apply
CO5	Evaluation of analytical data and understanding the phase rule and its applications	Apply

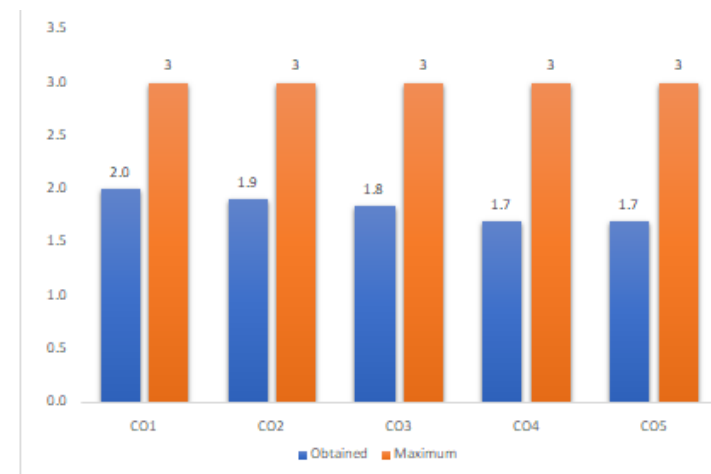
TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

SUBJECT:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
H	H	H	S	S	S	S	S	H	S	S	H
H	H	H	H	H	H	H	S	H	H	H	H
H	H	H	H	H	H	H	S	H	H	H	H
H	H	H	H	S	H	H	S	H	H	H	S
H	H	H	H	S	H	S	H	H	H	H	H

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	93.5	3.0			77.4	2.0	100.0	3.0	77.4	2.0	58.1	0.0	2.0	83.9	2.0	2.0	2.0
CO2	93.5	3.0			77.4	2.0			77.4	2.0	58.1	0.0	1.8	83.9	2.0	2.0	1.9
CO3	93.5	3.0	71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.6	83.9	2.0	2.0	1.8
CO4			71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.3	83.9	2.0	2.0	1.7
CO5			71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.3	83.9	2.0	2.0	1.7

AVERAGE	AVERAGE
2	1.828

ATTAINMENT SCALE:

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

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	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	H 1.9	
CO3	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	
CO4	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7	H 1.7	
CO5	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7		H 1.7
AVERAGE OF COS FOR POS	1.828	1.828	1.828	1.785	1.87	1.785	1.813333333	1.7
AVERAGE OF POS	1.7936	1.7936	1.7936	1.785	1.87	1.785	1.813333	1.7
AVERAGE	1.791766667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY II

COURSE CODE: CT18202

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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:** Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To understand the laws of thermodynamics	Understand
CO2	To understand Gibb's free energy, Claperyon equation and Vant Hoff isotherm	Analyze
CO3	Applying the colligative properties towards osmosis, osmotic potential	Apply
CO4	Real and ideal gases and derivation and relation between various constants	Apply
CO5	Evaluation of analytical data and understanding the phase rule and its applications	Apply

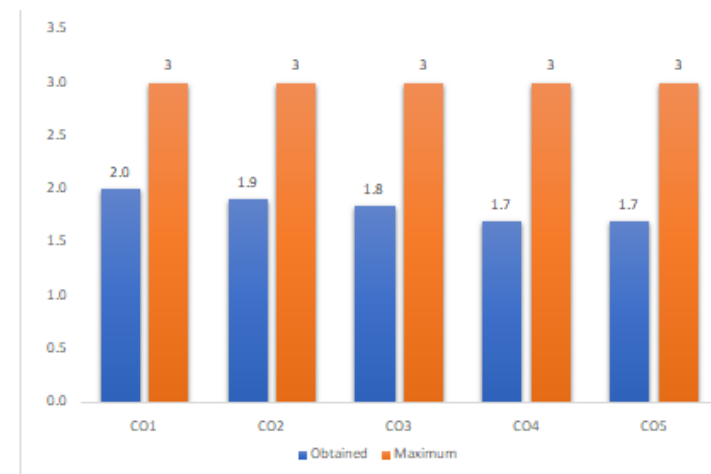
TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

SUBJECT:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
H	H	H	S	S	S	S	S	H	S	S	H
H	H	H	H	H	H	H	S	H	H	H	H
H	H	H	H	H	H	H	S	H	H	H	H
H	H	H	H	S	H	H	S	H	H	H	S
H	H	H	H	S	H	S	H	H	H	H	H

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	93.5	3.0			77.4	2.0	100.0	3.0	77.4	2.0	58.1	0.0	2.0	83.9	2.0	2.0	2.0
CO2	93.5	3.0			77.4	2.0			77.4	2.0	58.1	0.0	1.8	83.9	2.0	2.0	1.9
CO3	93.5	3.0	71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.6	83.9	2.0	2.0	1.8
CO4			71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.3	83.9	2.0	2.0	1.7
CO5			71.0	1.0	77.4	2.0			77.4	2.0	58.1	0.0	1.3	83.9	2.0	2.0	1.7

AVERAGE	AVERAGE
2	1.828

ATTAINMENT SCALE:

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

Table 3: PROGRAMME OUTCOME MAPPING



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	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	H 1.9	
CO3	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	H 1.84	
CO4	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7	H 1.7	
CO5	H 1.7	H 1.7	H 1.7	H 1.7		H 1.7		H 1.7
AVERAGE OF COS FOR POS	1.828	1.828	1.828	1.785	1.87	1.785	1.813333333	1.7
AVERAGE OF POS	1.7936	1.7936	1.7936	1.785	1.87	1.785	1.813333	1.7
AVERAGE	1.791766667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY I

COURSE CODE: CT18102

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To understand the atomic structure and wave properties along with bonding aspects	Understand
CO2	To analyse the periodic properties of different block elements and their properties	Analyze
CO3	To understand the chemistry of noble gases and metallurgy applications for metal extractions	Apply
CO4	IUPAC nomenclature of organic molecules and writing of different organic reactions	Apply
CO5	To apply the concept of aromaticity and understand different structures of aromatic molecules	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

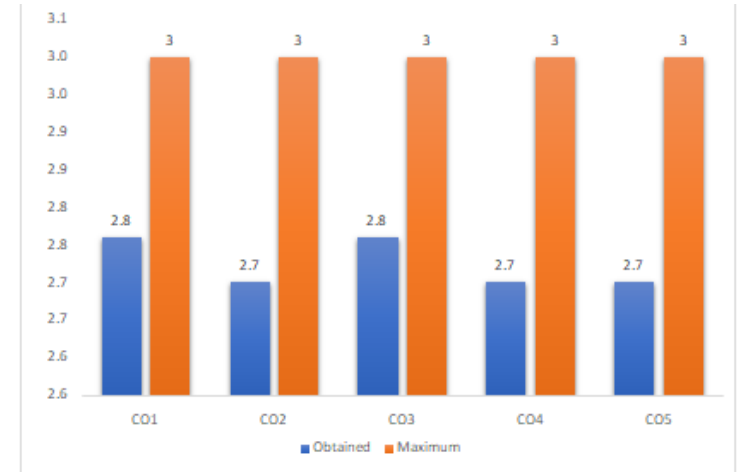
Chemical Technology

SUBJECT:

Chemistry I

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

Table 2: COURSE OUTCOME ATTAINMENT



co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDANCE		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	61.3	0.0	2.4	96.8	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	61.3	0.0	2.3	96.8	3.0	3.0	2.7
CO3	100.0	3.0	96.8	3.0	100.0	3.0			100.0	3.0	61.3	0.0	2.4	96.8	3.0	3.0	2.8
CO4			96.8	3.0	100.0	3.0			100.0	3.0	61.3	0.0	2.3	96.8	3.0	3.0	2.7
CO5			96.8	3.0	100.0	3.0			100.0	3.0	61.3	0.0	2.3	96.8	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

ATTAINMENT SCALE:

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

Table 3: PROGRAMME OUTCOME MAPPING



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	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	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	2.715	2.73	2.715	2.72	2.7
AVERAGE OF POS	2.7168	2.7168	2.7168	2.715	2.73	2.715	2.72	2.7
AVERAGE	2.7163							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CHEMISTRY I

COURSE CODE: CT18102

CREDITS: 4

DEPARTMENT: Chemical Technology

PROGRAMME OUTCOMES (B.Sc.) Or POs:

- **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 teamwork:** 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 OUTCOME (DEPARTMENT WISE):

- **PSO1.** Understand the basic concepts of Mathematics, Physics and Chemistry to apply in the field of Chemical Technology.
- **PSO2.** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- **PSO3.** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- **PSO4.** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.
- **PSO5.** Demonstrate and develop the appropriate solutions of the complex level of Chemical engineering design-based problems to meet the specified needs and overall sustainability of the processes, considering the necessary approaches of safety, health hazards, societal and environmental factors.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To understand the atomic structure and wave properties along with bonding aspects	Understand
CO2	To analyse the periodic properties of different block elements and their properties	Analyze
CO3	To understand the chemistry of noble gases and metallurgy applications for metal extractions	Apply
CO4	IUPAC nomenclature of organic molecules and writing of different organic reactions	Apply
CO5	To apply the concept of aromaticity and understand different structures of aromatic molecules	Apply

TABLE 1: CO, PO, PSO MAPPING

DEPARTMENT:

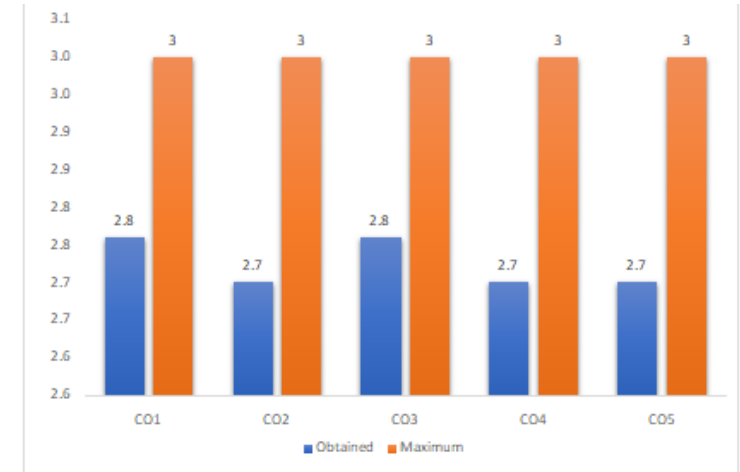
Chemical Technology

SUBJECT:

Chemistry I

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

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CO3	100.0	3.0	96.8	3.0	100.0	3.0			100.0	3.0	61.3	0.0	2.4	96.8	3.0	3.0	2.8
CO4			96.8	3.0	100.0	3.0			100.0	3.0	61.3	0.0	2.3	96.8	3.0	3.0	2.7
CO5			96.8	3.0	100.0	3.0			100.0	3.0	61.3	0.0	2.3	96.8	3.0	3.0	2.7

AVERAGE	AVERAGE
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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	2.715	2.73	2.715	2.72	2.7
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