ATTAINMENT OF PROGRAM OUTCOMES - B.Sc(MPC) 2021-22														
SEMESTER - I ATTAINMENTS														
Course	Sem	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
English	I	4	55.59	55.78	56.74		55.63	55.63			55.94			
Telugu	I	4	68.47	68.47	68.47	68.32	68.44	68.47	68.44	68.38	68.47			
Mathematics	I	4	58.52	58.57		58.76	58.52	58.51				58.52	58.46	
Physics	I	4	64.82	64.82	64.82						64.82			
Chemistry	I	4	50.79	51.49	51.17		51.29	51.31			51.23	51.31		
Semester-I attainments			59.64	59.83	57.99	63.54	53.46	53.47	68.44	68.38	60.11	54.92	58.46	

Remarks:

The above statistics shows that the course wise attainment of Program outcomes is above the targeted level (60%) for Telugu and physics courses & below the targeted level for English, Mathematics and chemistry courses. The faculty of English, Mathematics and especially chemistry advised to concentrate on effective TLE to improve attainment level.

Signature of IQAC Coordinator

Coordinator
IQAC
S.Ch.V.P.M.R. Govt. Degree College,
GANAPAVARAM.

Signature of Principal

PRINCIPAL
SRI CHINTALAPATI VARA PRASADA MURTHYRAJU
GOVERNMENT DEGREE COLLEGE
Accredited "B" by NAAC
GANAPAVARAM-534198. (Eluru Dist.)

ATTAINMENT OF PROGRAM OUTCOMES - B.Sc(MPC) 2021-22														
SEMESTER - II ATTAINMENTS														
Course	Sem	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
English	I	4	59.38	59.37	59.29		59.06	59.06	59.26		59.29			
Telugu	I	4	65.39	65.39	65.39	65.39	65.39	65.39	65.39	65.39	65.39			
Mathematics	I	4	62.15	62.1			62.1	61.96				62.1	62.15	
Physics	I	4	59.17	59.17	59.17						88.75			
Chemistry	I	4	68.57	69.17	68.9		69.01	69.03					68.95	69.03
Semester-I attainments			62.93	63.04	63.19	65.39	64.04	64.05	62.33	65.39	71.14	62.1	65.55	69.03

Remarks:

The above statistics shows that the attainment of course wise program outcomes is above the targeted level for all the courses.

Congratulations to all the faculty members. and try to enhance the attainment level further.

Signature of IQAC Coordinator

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ATTAINMENT OF PROGRAM OUTCOMES B.SC(MPC) (2021-22)

ATTAINMENT OF PROGRAM OUTCOMES - B.Sc(MPC) 2021-22												
TOTAL PROGRAM ATTAINMENTS FOR I & II SEMESTER												
Semester	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
I	59.64	59.83	57.99	63.54	53.46	53.47	68.44	68.38	60.11	54.92	58.46	
II	62.93	63.04	63.19	65.39	64.04	64.05	62.33	65.39	71.14	62.10	65.55	69.03
TOTAL ATTAINMENTS	**61.28**	**61.43**	**60.59**	**64.47**	**58.75**	**58.76**	**65.38**	**66.89**	**65.63**	**58.51**	**62.01**	**69.03**

Remarks:

Overall picture of the attainment of program outcomes of B.Sc. (MPC) revealed that PO's attainment is above the targeted level (60%) for PO1, PO2, PO3, PO4, PO7, PO8, PSO1, PSO3 and PSO4 and below the targeted level for PO5 & PSO2. Faculty members advised to Concentrate on PO5 and PSO2 in particular and all the POs in general to improve the attainment level.

Signature of IQAC Coordinator

Coordinator
IQAC
S.Ch.V.P.M.R. Govt. Degree College,
GANAPAVARAM.

Signature of Principal

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SRI CHINTALAPATI VARA PRASADA MURTHY RAJU
GOVERNMENT DEGREE COLLEGE
GANAPAVARAM-534 198
ESTD. 1972 • AFFILIATED TO ADIKAVI NANNAYA UNIVERSITY • ACCREDITED NAAC 'B'

PROGRAM OUTCOMES

B.SC(MPC)

2021-22 AB

PROGRAM OUTCOMES

On the successful completion of graduation, the students will be able to:

PO1: Domain expertise

- Acquire knowledge and skills
- Apply them effectively and innovatively

PO2: Continuous learning and research

- Continue learning with self-motivation
- Adapt to the evolving demands and needs of life
- investigate to see cause and effect relationship

PO3: Using modern equipment

- Use ICT effectively
- Use it for communication and innovation

PO4: Following ethics

- Ensure ethical practices in workplace and life
- Follow ethics in all endeavors

PO5: Complex problem solving

- Predict and analyze problems
- Investigate and interpret empirical data
- Plan and execute action for problem solving

PO6: Perform effectively both as individual and in team

- Work efficiently as an individual
- Cooperate, coordinate and ensure successful teamwork
- Prioritize common interest to individual interest

PO7: Efficient communication and life skills

- Listen, understand and express thoughts in an effective manner
- Choose appropriate media to share information

PO8: Environmental sustainability

- Understand environmental challenges
- Think critically on environment sustainability measures
- Follow and propagate environment-friendly practices

PO9: Societal contribution

- Render service for the general good of the society
- Involve voluntarily in social development activities at Regional, National, and Global levels
- Take pride in volunteering to address calamities, disasters, poverty, & epidemics
- be a patriotic citizen to uphold the values of the nation

PROGRAM SPECIFIC OUTCOMES

BSc. (MATHS, PHYSICS & CHEMISTRY)

PSO 1: Understand the theoretical concepts of physical and chemical properties of materials and the role of mathematics in dealing with them in a quantitative way, acquiring soft skills.

PSO 2: Analyse the concepts of mathematics, physics and chemistry and understand the relation among them like physical chemistry, mathematical modelling of physics and chemistry problems. Skills needed to handle instruments and adopt lab procedures to study physical chemical properties of materials.

PSO 3: Mathematical, numerical techniques required to model them.

PSO 4: Ability to interlink the skills and knowledge in mathematics, physics and chemistry and develop an aptitude to address the problems in biophysics, stock market analysis.

TELUGU

PROGRAM: B.SC MPC **YEAR: I** **SEMESTER: 1**

COURSE: CORE **CREDITS: 4** **HOURS: 4**

కోర్సు -1 : PAPER-1 Pracheena Telugu Kavitvam (ప్రాచీన తెలుగు కవిత్వం)

COURSE OBJECTIVES

CO 1. ప్రాచీన తెలుగుసాహిత్యం యొక్క ప్రాచీనతను , విశిష్టతను గుర్తిస్తారు . తెలుగు సాహిత్యంలో ఆదికవి నన్నయ కాలంనాటి భాషాసంస్కృతులను , ఇతిహాసకాలం నాటి రాజనీతి విషయాలపట్ల పరిజ్ఞానాన్ని సంపాదించగలరు .

CO 2. శివకవుల కాలంనాటి మతపరిస్థితులను , భాషావిశేషాలను గ్రహిస్తారు . తెలుగు నుడికారం , సామెతలు , లోకోక్తులు మొదలైన భాషాంశాల పట్ల పరిజ్ఞానాన్ని పొందగలరు .

CO 3.తిక్కన భారతంలాంటి మత , ధార్మిక పరిస్థితులను,తిక్కన కవితాశిల్పాన్ని , నాటకీయతను అవగాహన చేసుకోగలరు

CO 4. ఎఱ్ఱన సూక్తివైచిత్రిని,ఇతిహాస కవిత్వంలోని విభిన్న రీతులపట్ల అభిరుచిని పొందగలరు . శ్రీనాథుని కాలం నాటి కవితావిశేషాలను , మొల్ల కవితా విశిష్టతను గుర్తించగలరు .

CO 5. తెలుగు పద్యం స్వరూప స్వభావాలను , సాహిత్యాభిరుచిని పెంపొందించుకుంటారు. ప్రాచీన కావ్యభాషలోని వ్యాకరణాంశాలను అధ్యయనం చేయడం ద్వారా భాషాసామర్థ్యాన్ని , రచనలో మెళకువలను గ్రహించగలరు .

COURSE CONTENTS

CONTENT	CO	HOURS
యూనిట్- I రాజనీతి- నన్నయమహాభారతం - సభాపర్వం- ప్రథమాశ్వాసం- (26- 57 పద్యాలు)	**1,5**	**12**
యూనిట్-II దక్షయజ్ఞం –నన్నెచోడుడు కుమార సంభవం - ద్వితీయ శ్వాసం (49 - 86 పద్యాలు)	**2 & 5**	**15**
యూనిట్-III దౌమ్యధర్మోపదేశము - తిక్కన మహాభారతం - విరాటపర్వం - ప్రథమాశ్వాసం(116- 146) పద్యాలు	**3 & 5**	**12**
యూనిట్-IV పలనాటిబెబ్బులి - శ్రీ నాథుడు (పలనాటి వీర చరిత్ర - ద్విపద కావ్యం పుట 108- 112'బాలచంద్రుడు భీమంబగు సంగ్రామం బొనర్చుట.(108).…వెరగంది కుంది' (112) సం.అక్కిరాజు ఉమాకాంతం ముద్రణ: వి. కె .స్వామి, బెజవాడ 1911.	**4&5**	**15**
యూనిట్ - V సీతారావణసంవాదం-మొల్ల రామాయణము-సుందరకాండము–(40 - 87పద్యాలు)	**4 & 5**	**12**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	WEIGHTAGE (Marks)
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	Course Objective	Bloom's Taxonomy Level
ఈ క్రింది పద్యాలలో ఒక దానికి తప్పనిసరిగా ప్రతిపదార్థ తాత్పర్యాలను వ్యాకరణాంశాలను రాయండి ? **బహు ధన ధాన్య సంగ్రహము బాణ శరాసన యోధ వీరసం** **గ్రహము నిరంత రాంతరుదకంబులు ఘాసర సేంధ నౌఘసం** **గ్రహము ననేక యంత్రములుఁ గల్గియ** **సాధ్యములై ద్విషద్భయా** **వహులగు చుండ నొప్పునె భావత్పరి రక్ష్యములైన దుర్గముల్.**	1,2 & 4	Remembering and Understanding
నారదుడు ధర్మరాజుకు చెప్పిన రాజనీతిని సంగ్రహంగా తెలుపండి ?	1,2 & 4	Remembering and Understanding
ధౌమ్యుడు పాండవులకు చేసిన ధర్మోపదేశాన్ని వివరించండి ?	1,2 & 4	Applying and Analyzing
దక్ష యజ్ఞం పాఠ్య భాగ సారాంశాన్ని రాయండి ?	1 & 4	Remembering
ఈ క్రింది వానికి సందర్భ సహిత వ్యాఖ్యలను రాయండి? i). వార్తయందు జగము వర్ధిల్లుచున్నది**ii)** ఉపదేశం బవస్య కర్తవ్యంబు	1,2 & 4	Remembering&Analyzing

i)**రాజులు చేయకూడని దోషాలను తెలపండి?** **ii)** ధౌమ్యుడు పాండవులకు ధర్మోపదేశం ఎందుకు చేశాడు?	1,2 & 4	Remembering&Analyzing
ఈ క్రింది ఇవ్వబడిన వానికి విడదీసి సంధి కార్యములు వ్రాయుము? **1 దేవోత్తములు2. అభ్యంతరము3. విశ్వదాభిరామ4.** ఇట్లనిరి		
ఈ క్రింది వానికి విగ్రహవాక్యములు వ్రాసి, వాటి సమాసముల పేరును తెలియజేయుము ? **1**.రాజపుత్రులు**2.**ధనదాన్యములు**3.** గుణహీనుడు**4.** ప్రసన్నచిత్తులు	1,2 & 4	Remembering&Analyzing

MID II Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
1.పలనాటి బెబ్బులి కథాంశమును వ్రాయండి?	1 & 4	Remembering and Understanding
2.పలనాటి యుద్ధంలో బాలచంద్రునియుద్ధ కౌశలాన్ని వివరించండి?	1 & 4	Remembering and Understanding
3.సీతా రావణ సంవాదాన్ని సంగ్రహంగా రాయండి?	**1 & 4**	Remembering and Understanding
పారిపోతున్న తన సైన్యమునకు, నరసింహారాజు,చెప్పిన ధైర్య వచనములు ఏవి?	**1&4**	Remembering and Understanding
బాల చంద్రుని చూసి నలగామరాజు సైన్యం భయపడిన విధమెట్టిది?	**1 & 2**	Remembering and Understanding
తనను నిందించిన సీతను రావణుడు బెదిరించిన విధమెట్టిది?	**1 & 2**	Remembering and Understanding
త్రిజట తన స్వప్నాన్ని గురించి తోటి కావలికత్తెలతో ఏమని చెప్పింది?	**2**	Remembering and Applying
సందర్భం-చాల సేపీగతి సమరం బొనరెచ్?	**1**	Remembering
సందర్భం-రాముడే రీతి లంకకు రాగలండు ?	**1**	Remembering and Applying
సందర్భం-సిద్ధం బీమాట వేద సిద్ధాంతముగన్	**1**	Remembering
పలనాటి బెబ్బులి పాఠ్యభాగ రచయిత ఎవరు ?	**1**	Remembering

శ్రీనాథుని బిరుదు ఏది ?	1	Applying
నాగమ్మ ఎవరి మంత్రి ?	1	Understanding
బ్రహ్మనాయునికొడుకుపేరేమి?	1	Understanding
కొదమ సింహము ఏ సమాసం ?	1	Remembering
సమరోర్వి- విడదీయండి ?	1	Understanding
దశరథునికి ఎంతమంది భార్యలు?	1	Remembering
మాయలేడి రూపంలో ఉన్న రాక్షసుని పేరేమిటి?	1	Applying
రావణుని సోదరి పేరేమిటి ? 'శాంతవచనములు' ఏ సమాసం?	1	Understanding

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	బహు ధన ధాన్య సంగ్రహము బాణ శరాసన యోధ వీరసం గ్రహము నిరంత రాంతరుదకంబులు ఘాసర సేంధ నౌఘసం గ్రహము ననేక యంత్రములుఁ గల్గియ సాధ్యములై ద్విషద్భయా వహులగు చుండ నొప్పునె భావత్పరి రక్ష్యములైన దుర్గముల్.	Understanding&Remembering
2	రాజులు చేయకూడని దోషాలను తెలపండి? ధౌమ్యుడుపాండవులకు ధర్మోపదేశం ఎందుకు చేశాడు? రాజనీతి పాఠ్య భాగ సారాంశం రాయండి?	Understanding and applying
3	దక్షయజ్ఞం పాఠ్య భాగ సారాంశాన్ని వివరించండి ?	Remembering and applying
4	సంధులు సమాసాలు అలంకారాలు చంధస్సు	Understanding
5	ఎండకు వాన కోర్చితనయిల్లుప్రవసపుఁజోటు నాక యా కొండునలంగుదున్నిదురకుందఱిదప్పెడుడ ప్పివుఱ్ఱె నొ క్కండనయెట్లొకోయనక కార్యము ముట్టినచోటనేలినా తం డొకచాయ చూపినను దత్పరతం బని సేయుటొప్పగున్.	Understanding and applying

6	**ధౌమ్యుడు పాండవులకు చేసిన ధర్మోపదేశాన్ని వివరించండి ?**	Remembering, understanding and evaluation
7	**పలనాటి బెబ్బులి కథాంశాన్ని రాయండి?**	Understanding and applying
8	**బాలచంద్రుని పరాక్రమం వర్ణించండి?పారిపోతున్న సైన్యానికి నరసింహ భూపతి చెప్పిన ధైర్య వచనాలేవి?**	Understanding
9	**సీతారావణ సంవాద పాఠ్యభాగ సారాంశాన్ని వివరించండి ?**	Understanding and applying
10	**మొల్లను పరిచయం చేయండి? మరియు త్రిజట స్వప్న వృత్తాంతాన్ని తెలపండి?**	Understanding and applying

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Chart preparation and Teach back session	Understanding and Analysis
2	**Debate on ప్రాచీన సాహిత్య అధ్యయనం ఆవసరమా? అనవసరమా?**	Applying , Analyzing and Evaluating
3	Clean and Green	Understanding
4	స్టూడెంట్ సెమినార్స్ Students Seminars	Remembering, Understanding and Applying
5	పదాలతో అంత్యాక్షరి Padalato Antyakshari	Understanding, Applying, Analyzing and Evaluating
6	QUIZ	Analyzing and Evaluating
7	Group Discussion	Covering of Lower order and Higher order thinking skills

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1
CO1	3	3	3			3	3	3	3
CO2	3	3	3		3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3		3

CO Attainments (Direct and Indirect)

CO	DIRECT	INDIRECT	Total CO Attainment
CO1	62.1	95	65.39
CO2	62.1	95	65.39
CO3	62.1	95	65.39
CO4	62.1	95	65.39

PO and PSO Attainment (Direct and Indirect)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1
CO1	68.32	68.32	68.32		68.32	68.32	68.32	68.32	68.32
CO2	68.57	68.57	68.57		68.57	68.57	68.57	68.57	68.57
CO3	68.32	68.32	68.32	68.32	68.32	68.32	68.32	68.32	68.32
CO4	68.57	68.57	68.57	68.32	68.57	68.57	68.57	68.32	68.57
CO5	68.57	68.57	68.57	68.32	68.57	68.57	68.57	68.32	68.57
PO Attainment	68.47	68.47	68.47	68.32	68.44	68.47	68.44	68.38	68.47

CO's attainment is good, try to improve it further

Signature of the Program Coordinator

Lecturer in charge
Dept of Chemistry

ENGLISH

PROGRAM: MPC **YEAR: I** **SEMESTER: 1**

COURSE: ENGLISH **CREDITS: 3** **HOURS: 4**

ENGLISH PAPER I - A Course In Communication And Soft Skills

COURSE OBJECTIVES

CO1 To use grammar effectively in writing and speaking
CO2 To use soft skills in practical situations
CO3 To be able to use communication skills confidently.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: Listening Skills i. Importance of Listening ii. ii. Types of Listening iii. iii. Barriers to Listening iv. iv. Effective Listening.	**2, 3**	**10**
UNIT II: Speaking Skills a. Sounds of English: Vowels and Consonants b. Word Accent c. Intonation	**3**	**10**
UNIT III: Grammar a) Concord b) Modals c) Tenses (Present/Past/Future) d) Articles e) Prepositions f) Question Tags g) Sentence Transformation (Voice, Reported Speech & Degrees of Comparison) h) Error Correction	**1, 2, 3**	**20**
UNIT IV: Writing : v.Punctuation vi.Spelling vii.Paragraph Writing	**1**	**10**
UNIT V: Soft Skills a. SWOC b. Attitude c. Emotional Intelligence d. Telephone Etiquette e. Interpersonal Skills	**2, 3**	**10**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	WEIGHTAGE (Marks)
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	Course Objective	Bloom's Taxonomy Level
What do you know about interpersonal skills?	1,2	Remembering and Understanding
What is a positive attitude?	1,2	Remembering and Understanding
How can you improve your positive attitude?	1,2	Remembering and Understanding
What is the difference between hearing and listening?	1,2	Remembering and Understanding
What is passive listening?	1,2	Remembering and Understanding
Write any two barriers to effective listening.	1,2	Remembering and Understanding
Explain any two strategies for effective listening..	1,2	Remembering and Understanding
Write the names of types of listening (only names).	1,2	Remembering and Understanding
What is the stress shift?	3	Remembering and Understanding
What is SWOC analysis?	2	Applying and evaluating
Spell the following.	1	Remembering and applying

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
Fill in the blanks with the correct form of the verb	1	Remembering and applying
Add question tags.	1	Remembering and applying
Fill in the blanks with the appropriate prepositions	1	Remembering and applying

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	What is a positive attitude?	Understanding
2	What is the difference between hearing and listening?	Understanding and applying
3	What is swoc analysis?	Remembering and analyzing
4	Write any two barriers to effective listening.	Remembering Understanding
5	Add question tags.	Understanding and applying
6	Fill in the blanks with the appropriate prepositions	Understanding and applying

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Teach back session	Understanding and Analyzing
2	Student Seminar on 'Importance of listening'	Understanding and Analyzing
3	Group discussion on 'SWOC Analysis'	Analyzing and Evaluating
4	Google Quiz on 'Articles'	Understanding and Applying
5	Google Quiz on 'Prepositions'	Understanding and Applying,
7	Group Discussion on 'English as a Global Language	Thinking and analyzing skills

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/PSO	PO 1	PO 2	PO 3	PO 5	PO 6	PSO1
CO 1	3					3
CO 2		3				3
CO 3				3	3	3

CO Attainments (Direct and Indirect)

CO	Direct	Indirect	Total CO Attainment
CO 1	52.58	82.69	55.59
CO 2	52.58	84.62	55.78
CO 3	51.77	90.38	55.63

PO and PSO Attainment (Direct and Indirect)

	PO 1	PO 2	PO 3	PO 5	PO 6	PSO 1
	3	3	3	3	3	3
CO 1	55.59					55.59
CO 2		55.78				55.78
CO 3				55.63	55.63	55.63
PO Attainment	55.59	55.78	56.74	55.63	55.63	55.94

CO's attainment is nearer to benchmark, try to improve it

Signature of the Program Coordinator

Lecturer in charge
Dept of chemistry

MATHEMATICS

PROGRAM:B.SC(MPC) **YEAR: I** **SEMESTER: 1**

COURSE: CORE **CREDITS: 5** **HOURS: 6**

MATHEMATICS PAPER I - DIFFERENTIAL EQUATIONS

COURSE OUTCOMES:

CO1 Solve linear differential equations

CO2 Convert non exact homogeneous equations to exact differential equations by using integrating factors

CO3 Know the methods of finding solutions of differential equations of the first order but not of the first Degree.

CO4 Solve higher-order linear differential equations, both homogeneous and non homogeneous, with constant coefficients**.**

CO5 Understand the concept and apply appropriate methods for solving differential equations**.**

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: Differential Equations of first order and first degree: Linear Differential Equations; Differential equations reducible to linear form; Exact differential equations; Integrating factors.	**1, 2 & 5**	**12**
UNIT II: Differential Equations of first order but not of the first degree: Equations solvable for p; Equations solvable for y; Equations solvable for x; Equations homogeneous in x and y; Equations of the first degree in x and y – Clairaut's Equation.	**1, 3 & 5**	**12**
UNIT III: Higher order linear differential equations-I: Solution of homogeneous linear differential equations of order n with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators. General Solution of f(D)y=0. General Solution of f(D)y=Q when Q is a function 1/f(D) is expressed as partial fractions of x, P.I. of f(D)y = Q when Q= beax P.I. of f(D)y = Q when Q is bsin ax or b cos ax**.**	**1, 4 & 5**	**12**

UNIT IV: Higher order linear differential equations-II: Solution of the non-homogeneous linear differential equations with constant coefficients. P.I. of f(D)y = Q when Q= bxk P.I. of f(D)y = Q when Q= eax V , where V is a function of x. P.I. of f(D)y = Q when Q= xV , where V is a function of x. P.I. of f(D)y = Q when Q= xmV , where V is a function of x.	**1, 4 & 5**	**12**
UNIT V: Higher order linear differential equations-III : Method of variation of parameters; Linear differential Equations with non-constant coefficients(Solution when a part of CF is known method only); The Cauchy-Euler Equation, Legendre's linear equations.	**1, 4 & 5**	**12**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	**WEIGHTAGE (Marks)**
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Solve (xy^3)dx-(x^3+y^3)dy=0	1,2 & 5	Remembering and Applying
Solve (1+y^2)dx=(tan−1y–x)dy=0	1,2 & 5	Remembering and Applying
Solve (dy/dx)(x^2y^3+xy)=1	1,4 & 5	Remembering and Applying
Solve (D^2-4D+3)y=Sin3xCos2x	1,4 & 5	Remembering and Applying
Solve (D^2-3D+2)y=Coshx	1,4 & 5	Remembering and Applying
Solve (D^2+4)y=e^x+sin2x+cos2x	1,4 & 5	Remembering and Applying

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
Solve (x^2D^2+3Dx+1)y=1/(1-x)^2	1,4 & 5	Remembering and Applying
Solve y^2 logy = xyp+p^2	1,3 & 5	Remembering and Applying
Solve xy^2(p^2+2) = 2py^3+x^3	1,3 & 5	Remembering and Applying
Solve (x^3D^3+2x^2d^2+xD-1)y = 0	1,4 & 5	Remembering and Applying
Solve (D^4-2D^3+2D^2-2D+1)y=0	1,4 & 5	Remembering and Applying
Solve (D^2+D+1)y=0	1,4 & 5	Remembering and Applying
Solve (y-xp)(p-1) = p	1,3 & 5	Remembering and Applying
Solve y^2-2pxy+p^2(x^2-1)= m^2 by clairaut's method	1,3 & 5	Remembering and Applying
Solve y+px=p^2x^4	1,3 & 5	Remembering and Applying
Solve xp^3 = a+bp	1,3 & 5	Remembering and Applying
If Yp=AU+BV in method of variation of parameter. Give the values of A and B is_____	4	Remembering
If y=x and y=xe^(ax) are linearly independent solutions of homogeneous equations then yc=_____	4	Remembering and Applying
Yc=C1cosx+C2sinx then find A=_____ in method of variation of parameters	4	Remembering and Applying
If y=xp=f(p) then find a general solution?	3	Understanding, Remembering and Applying
∫UdV=_____	1	Remembering
∫Cosec X dx= ____	1	Remembering
∫xe^x dx =____	1	Remembering
Linear differential equation of first order is (dy/dx)+y P(x) = Q(x) then integrating factor(IF) is ____	1 & 3	Remembering
Mdx+Ndy=0 is a homogeneous differential equation and Mx=Ny≠0. Then integrating factor(IF) of Mdx+Ndy is _____	1 & 4	Remembering
∫{f'(x)/f(x)} dx=_____	1	Remembering

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	Solve (D^2+a^2)= sec ax Solve (D^2+16)= tan 4x	Understanding and applying
2	Solve (D^2-2D+4)y=8(x^2+e^2x+ sin2x) Solve (D^3+2D^2+D)y= e^2x+ x^2+x	Understanding and applying
3	Solve (D^2-5D+6)y= e^4x(x) Solve D^2y-6Dy+13y=8e^(3x)sin2x	Understanding and applying
4	Solve D^2y+3 Dy+2y= x e^x sinx Solve (D^2+2D+1)y=x cosx Solve (D^2+4) = x Sinx	Understanding and applying
5	Solve(D^4+2D^2+1)y = x^2 cosx Solve (D^2-4D=4)y = 8x^2 e^(2x) six	Understanding and applying
6	a)Solve x^3D^3y+2x^2D^2y+2y=10[x=(1/x)] b)If y=x and y=xe^(ax) are linearly independent solutions of homogeneous equations corresponding to x^2D^2y-2x(1+x)Dy+2(x+1)y = x^3	Understanding, Remembering and applying
7	Solve 3 x^2D^2y+xDy+y=x Solve (x^3D^2+2xD-12)y=x^3 logx	Understanding and applying
8	Solve D^2y+(1/x)Dy=12 (logx/x^2) Solve x^2D^2y+3xDy+y=1/(1-x)^2	Understanding and applying
9	Solve x^2 D^2y-3xDy+5y= x^2 sin(log x) Solve (x^2D^2+2xD-20)y=(x+1)^2	Understanding and applying
10	Solve p^2+2py cotx=y^2 Solve x+yp^2=(1+xy)p	Understanding and applying
11	Solve y+px=p^2x^4 Solve y=2xp+x^2p^4	Understanding and applying
12	Solve (1+e^(x/y))dx+e^(x/y)[1-(x/y)]dy=0 Solve (4x+3y+1)dx+(3x+2y+1)dy=0 Solve xdy-ydx=xy^2dx Solve xdx+ydy+{[xdy-ydx]/[x^2+y^2]}=0	Understanding and applying
13	Solve x^2ydx-(x^3+y^3)dy=0 Solve y^2 dx+(x^2-xy-y^2)=0 Solve xDy=y+xe^(y/x)	Understanding and applying
14	Solve (x^3y^3+x^2y^2+xy+1)ydx + (x^3y^3-x^2y^2-xy+1)xdy=0 Solve y(1+xy)dx+x(1-xy)dy=0	Understanding and applying
15	Solve cos^2 x (dy/dx)+y=tanx Solve (1+x^2)(dy/dx)+2xy-4x^2=0	Understanding and applying

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Quiz on general knowledge	Knowledge Remembering
2	Quiz on 'life of Srinivasa Ramanujan"	Knowledge Remembering
3	Student seminar on Method of variation of parameters	Understanding and Applying
4	Chart preparation on value of Pi(π=3.14)	Analyzing and Creating
5	Chart preparation on Constructing parabola by simple straight lines.	Analyzing and Creating
6	Group discussion on Differential equations.	Remembering, Understanding, Applying , Analyzing and Evaluating
7	Clean and Green	Understanding

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/PSO	PO 1	PO 2	PO 4	PO 5	PO 6	PSO 2	PSO 3
CO 1	3			3		3	3
CO 2	3	3		3	3	3	3
CO 3	3	3		3	3	3	3
CO 4	3	3		3	3	3	3
CO 5	3	3	3	3		3	

CO Attainments (Direct and Indirect)

CO	Direct	Indirect	Total CO Attainment
CO 1	54.51	92.50	58.31
CO 2	55.11	90.00	58.60
CO 3	54.41	95.00	58.47
CO 4	54.39	95.00	58.45
CO 5	54.45	97.50	58.76

PO and PSO Attainment (Direct and Indirect)

	PO 1	PO 2	PO 4	PO 5	PO 6	PSO 2	PSO 3
	3	3	3	3	3	3	3
CO 1	58.31			58.31		58.31	58.31
CO 2	58.60	58.60		58.60	58.60	58.60	58.60
CO 3	58.47	58.47		58.47	58.47	58.47	58.47
CO 4	58.45	58.45		58.45	58.45	58.45	58.45
CO5	58.76	58.76	58.76	58.76		58.76	
PO Attainment	58.52	58.57	58.76	58.52	58.51	58.52	58.46

CO's attainment is nearer to bench mark, try to improve

Signature of the Program Coordinator

Lecturer in Chem

PHYSICS

PROGRAM: B SC (MATHS, PHYSICS & CHEMISTRY)
YEAR: I **SEMESTER:I**
COURSE: CORE **CREDITS: 4+1** **HOURS: 4+2**

PHYSICS PAPER I - Mechanics, Waves & Oscillations

COURSE OBJECTIVES:

CO1● To understand basic theories related with properties of matter and its applications to determine values of various quantities associated with matter.

CO2 ● Be able to know the properties of matter to explain natural physical processes and related technological advances.

CO3 ● To learn about fundamentals of verbal and mathematical concepts of waves and oscillations.

CO4 ● We should make the students to know their skills required to get the information from the syllabus and use them in a proper way.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I:. Mechanics of Particles: Review of Newton's Laws of Motion, Motion of variable mass system, Motion of a rocket, Multistage rocket, Concept of impact parameter, scattering cross-section, Rutherford scattering-Derivation. Mechanics of Rigid bodies: Rigid body, rotational kinematic relations, Equation of motion for a rotating body, Angular momentum and Moment of inertia tensor, Euler equations, Precession of a spinning top, Gyroscope, Precession of the equinoxes	1, 2, 3 & 4	12
UNIT II:. Motion in a Central Force Field: Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under a central force, Kepler's laws of planetary motion- Proofs, Motion of satellites, Basic idea of Global Positioning System (GPS), weightlessness, Physiological effects of astronauts	1, 2, 3 & 4	12
UNIT III Relativistic Mechanics: Introduction to relativity, Frames of reference, Galilean transformations, absolute frames, Michelson-Morley experiment, negative result, Postulates of Special theory of relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation	1, 2, 3 & 4	12

UNIT IV: Undammed, Damped and Forced oscillations: Simple harmonic oscillator and solution of the differential equation, Damped harmonic oscillator, Forced harmonic oscillator – Their differential equations and solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor. Coupled oscillations: Coupled oscillators - introduction , Two coupled oscillators, Normal coordinates and Normal Modes	1, 2, 3 & 4	12
UNIT V:. Vibrating Strings: Transverse wave propagation along a stretched string, General solution of wave equation and its significance, Modes of vibration of stretched string clamped at ends, Overtones and Harmonics. Ultrasonic's: Ultrasonic's, General Properties of ultrasonic waves, Production of ultrasonic's by piezoelectric and magneto striation methods, Detection of ultrasonic's, Applications of ultrasonic waves, SONAR	1, 2, 3 & 4	12

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	**WEIGHTAGE (Marks)**
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Explain the principle of motion of a rocket and derive for its velocity at any instant when it is moving under constant gravitational field	**1, 2, 3 & 4**	Remembering and Understanding
. Derive Euler equations	**1, 2, 3 & 4**	Remembering and Understanding
Explain Impact Parameters	**1, 2, 3 & 4**	Applying and Analyzing
Write a short note on Gyroscope	**1, 2, 3 & 4**	Remembering

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
What is the frequency range of ultrasonic waves?	**1, 2, 3 & 4**	Remembering and Understanding
What is the main application of ultrasonic waves?	**1, 2, 3 & 4**	Remembering and Understanding
.How are ultrasonic waves generated?	**1, 2, 3 & 4**	Remembering and Understanding
What is the velocity of ultrasonic waves in water?	**1, 2, 3 & 4**	Remembering and Understanding
.What is the principle behind ultrasonic testing of materials?	**1, 2, 3 & 4**	Remembering and Understanding
What is the wavelength of ultrasonic waves in air?	**1, 2, 3 & 4**	Remembering and Understanding
.What is the most common frequency used in ultrasonic testing?	**1, 2, 3 & 4**	Remembering and Applying
What is the main advantage of using ultrasonic waves for inspection?	**1, 2, 3 & 4**	Remembering
How do ultrasonic waves interact with a material?	**1, 2, 3 & 4**	Remembering and Applying
.What is the use of ultrasonic waves in welding?	**1, 2, 3 & 4**	Remembering
What is the most common material used to generate ultrasonic waves?	**1, 2, 3 & 4**	Remembering
What is the main disadvantage of using ultrasonic waves for inspection?	**1, 2, 3 & 4**	Applying
.What is the effect of temperature on the velocity of ultrasonic waves?	**1, 2, 3 & 4**	Understanding
What is the most common method used to detect ultrasonic waves?	**1, 2, 3 & 4**	Understanding
What is the effect of frequency on the velocity of ultrasonic waves?	**1, 2, 3 & 4**	Remembering

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	Explain the principle of motion of a rocket and derive for its velocity at any instant when it is moving under constant gravitational field	Understanding
2	. Derive Euler equations	Understanding and applying
3	Explain Impact Parameters	Remembering and applying
4	Write a short note on Gyroscope	Understanding
5	Derive Lorentz transformations	Understanding and applying
6	Solve the differential equation of damped Harmonic Oscillator and discuss the critical damping	Remembering, understanding and evaluation
7	Discuss about two coupled oscillator and derive expression for normal modes.	Understanding and applying
8	Derive an equation for the propagation of transverse waves along string. Discuss the case of string clamped at both ends	Understanding

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Student seminar Einstein's mass energy relation	Understanding and Analysis
2	Group Discussion Impact Parameters	Applying , Analyzing and Evaluating
3	Clean and Green	Understanding
4	Quiz on Motion in a Central Force Field	Remembering, Understanding and Applying
5	Student Study Project on GPS	Understanding, Applying, Analyzing and Evaluating
6	" Student seminar Ultrasonic	Analyzing and Evaluating
7	Student Study Project	Covering of Lower order and Higher order thinking skills

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/PSO	PO 1	PO 2	PO 3	PO 5	PO 6	PSO 1
CO 1	**3**	**3**	**3**			**3**
CO 2	**3**	**3**	**3**			**3**
CO 3	**3**	**3**	**3**			**3**
CO 4	**3**	**3**	**3**			**3**

CO Attainments (Direct and Indirect)

CO	DIRECT	INDIRECT	Total CO Attainment
CO1	61.78	90.00	64.60
CO2	61.78	92.50	64.85
CO3	61.63	95.00	64.97
CO4	61.78	92.50	64.85

PO and PSO Attainment (Direct and Indirect)

	PO1	PO2	PO3	PSO1
CO1	64.6	64.6	64.6	64.6
CO2	64.85	64.85	64.85	64.85
CO3	64.97	64.97	64.97	64.97
CO4	64.85	64.85	64.85	64.85
PO Attainment	64.8175	64.8175	64.8175	64.8175

CO's attainments is good, try to improve further

Dept of chemistry

Signature of the Program Coordinator

Lecturer in charge
Dept of chemistry

CHEMISTRY PAPER I: INORGANIC AND PHYSICAL CHEMISTRY

PROGRAM: B.Sc(MPC) **YEAR: I** **SEMESTER: 1**

COURSE: 1 **CREDITS: 4+1** **HOURS: 4+2**

COURSE OBJECTIVES

CO-1 : Understand the basic concepts of p-block elements

CO-2 : Explain the difference between solid, liquid and gasses in terms of intermolecular interactions.

CO-3 : Apply the concepts of gas equations, pH and electrolytes while studying other chemistry courses.

CO-4 : Understand the basic concepts of qualitative analysis of inorganic mixture .

CO-5 : Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.

Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: INORGANIC CHEMISTRY :Chemistry of p-block elements Group 13: Preparation & structure of Diborane, Borazine Group 14: Preparation, classification and uses of silicones Group 15: Preparation & structures of Phosphonitrilic halides {(PNCl2)n where n=3, 4 Group 16: Oxides and Oxoacids of Sulphur (structures only) Group 17: Pseudohalogens, Structures of Interhalogen compounds.	**1**	**15**
UNIT II: **1. Chemistry of d-block elements:** Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states. **2. Chemistry of f-block elements:** Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides. **3. Theories of bonding in metals:** Valence bond theory and Free electron theory, explanation of thermal and electrical conductivity of metals based on these theories, Band theory- formation of bands, explanation of conductors, semiconductors and insulators.	**2**	**15**
UNIT III: PHYSICAL CHEMISTRY	**2**	**10**

Solid state Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Miller indices, Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Powder method. Defects in crystals. Stoichiometric and non-stoichiometric defects.		
UNIT IV: **1. Gaseous state** van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. Relationship between critical constants and vander Waal's constants. Lawof corresponding states. Joule- Thomson effect. Inversion temperature. **2. Liquid state** Liquid crystals, mesomorphic state. Differences between liquid crystal and solid/liquid. Classification of liquid crystals into Smectic and Nematic. Application of liquid crystals as LCD devices.	**2, 3**	**10**
UNIT V:SOLUTIONS, IONIC EQUILIBRIUM & DILUTE SOLUTIONS **1. Solutions** Azeotropes- HCl-H2O system and ethanol-water system. Partially miscible liquids- phenol- water system. Critical solution temperature (CST), Effect of impurity on consulate temperature. Immiscible liquids and steam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law. **2. Ionic equilibrium** Ionic product, common ion effect, solubility and solubility product. Calculations based on solubility product. **3. Dilute solutions** Colligative properties- RLVP, Osmotic pressure, Elevation in boing point and depression in freezing point. Experimental methods for the determination of molar mass of a non-volatile solute using osmotic pressure, Elevation in boiling point and depression in freezing point. Abnormal colligative properties. Van't Hoff factor.	**2, 3 & 5**	**10**
Analysis of SALT MIXTURE 50 M Analysis of mixture salt containing two anions and two cations (From two different groups) from the following: **Anions**: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate, Phosphate. **Cations:** Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Potassium and Ammonium.	**4 & 5**	**30**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	**WEIGHTAGE (Marks)**
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	

CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Write the preparations and Structure of diborane OR Write about interhalogen compounds.	1	Remembering and Understanding
What is lanthanide contraction and explain its consequences.	2	Understanding
Write a short note on Band theory	2	Remembering and Understanding
Write a note on Pseudohalogens	1	Applying and Analyzing

MID II Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Derive vandewaal's equation	1 & 4	Remembering and Understanding
Explain stoichiometric crystal defects	1 & 4	Remembering and Understanding
Derive Bragg's equation	1 & 4	Remembering and Understanding
Define critical state	1	Remembering and Understanding
Write Joule Thompson effect	1 & 2	Remembering and Understanding
What are liquid crystals and classify them.	1 & 2	Remembering and Understanding
Define space lattice and unit cell	2	Remembering and Applying
Define azeotropic mixtures	1	Remembering
Define CST	1	Remembering and Applying

Define solubility product	1	Remembering
Schottky defect generally appear in a) NaCl b) CsCl c) KCl d) all	1	Remembering
A gas consists of a large number of particles called a) Molecules b) atoms c) ions d) protons	1	Applying
When solid changes to liquid is called a) melting b) boiling c) evaporation d) freeging	1	Understanding
Liquid are east to compress (True/False)	1	Understanding
When a gas changes into a liquid it is called a) condensation b) evaporation c) precipitation d) transpiration	1	Remembering
Plasma is a fourth state of matter (True/False)	1	Understanding
Which is the source of oxides of sulphur a) Thermal power plant b) sulphuric acid plant c) Both d) None of these	1	Remembering
Example for minimum boiling pt azeotrope is a) Ethanol + Chloroform b) ethanol + water c) benzene + toluene d) benzene + water	1	Applying
Example of upper CST a) Phenol-water system b) triethyl amine- water system c) aniline-water system d) nicotine- water system	1 & 4	Understanding
A binary solution is a mixture of a) one component b) two component c) three component d) none	4	Applying

Assignments

S. No.	**Topic**	**Bloom's Taxonomy Level**
1	Explain preparations and structure of diborane and borazole	Understanding and applying
2	Explain about interhalogen compounds and Pseudo halogens	Understanding and applying

3	Write about characteristic properties of d-block elements.	Remembering and applying
4	Explain Lanthanide contraction and its consequences.	Understanding
5	Derive Braggs Equation and explain the method	Understanding and applying
6	Explain Defects in Crystals	Remembering, understanding and evaluation
7	Derive Vanderwaal equation and derive critical constants from vanderwaal equation	Understanding and applying
8	Explain about CST and Azeotropic mixtures	Understanding

Classroom Activities

S. No.	**Activity and Topic**	**Bloom's Taxonomy Level**
1	Student seminars	Understanding and Analysis
2	Group Discussion on "Fossil fuels – its impact on environment"	Applying, Analyzing and Evaluating
3	Clean and Green	Understanding
4	Google Quiz	Remembering, Understanding and Applying

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/PSO	PO 1	PO 2	PO 3	PO 5	PO 6	PSO 1	PSO 2
CO 1	3					3	
CO 2		3				3	
CO 3				3	3		3
CO 4			3				3
CO 5						3	3

CO Attainments (Direct and Indirect)

CO	DIRECT	INDIRECT	Total CO Attainment
CO1	46.44	90	50.79
CO2	46.93	92.5	51.49
CO3	46.96	90	51.27
CO4	46.57	92.5	51.17
CO5	46.61	95	51.45

PO and PSO Attainment (Direct and Indirect)

	PO1	PO2	PO3	PO5	PO6	PSO1	PSO2
CO1	50.79					50.79	
CO2		51.49				51.49	
CO3				51.27	51.27		51.27
CO4			51.17				51.17
CO5						51.45	51.45
PO Attainment	50.79	51.49	51.17	51.27	51.27	51.23	51.31

CO's attainments is lower than the bench mark, needs improvement.

Signature of the Program Coordinator

Lecturer in charge
Dept of Chemistry

Telugu PAPER II – Adhunika Telugu Sahityam (ఆధునిక తెలుగు సాహిత్యం)

PROGRAM: B.SC MPC **YEAR: I** **SEMESTER: 2**

COURSE: CORE **CREDITS: 4** **HOURS: 5**

COURSE OBJECTIVE

CO 1. ఆంగ్లభాష ప్రభావం కారణంగా తెలుగులో వచ్చిన ఆధునిక సాహిత్యాన్ని , దాని విశిష్టతను గుర్తిస్తారు .

CO 2. సమకాలీన ఆధునిక సాహిత్య ప్రక్రియలైన " వచన కవిత్వం , కథ , నవల , నాటకం , విమర్శ " లపై అవగాహన పొందుతారు .

CO 3. భావకవిత , అభ్యుదయ కవితాలక్ష్యాలను గూర్చిన జ్ఞానాన్ని పొందుతారు . అస్తిత్వవాద ఉద్యమాలపుట్టుకను , ఆవశ్యకతను గుర్తిస్తారు .

CO 4. కథాసాహిత్యం ద్వారా సామాజిక చైతన్యాన్ని పొందుతారు . సిద్ధాంతాల ద్వారా కాకుండా , వాస్తవ పరిస్థితులను తెలుసుకోవడం ద్వారా సిద్ధాంతాన్ని సమీక్షించగలరు .

CO 5. ఆధునిక తెలుగు కల్పనాసాహిత్యం ద్వారా సామాజిక , సాంస్కృతిక , రాజకీయ చైతన్యాన్ని పొందుతారు .

COURSE CONTENTS

CONTENT	CO	HOURS
యూనిట్- I : ఆధునిక కవిత్వం **1.ఆధునిక కవిత్వం-** పరిచయం **2.కొండవీడు–**దువ్వూరి రామిరెడ్డి(కవి కోకిల గ్రంథావళి-ఖండకావ్యాలు-**నక్షత్రమాల**సంపుటి నుండి) 3.**మాతృ సంగీతం–**అనిసెట్టిసుబ్బారావు(అగ్నివీణ కవితా సంపుటి నుండి) **4.తాతకోనూలు పోగు-**బండారు ప్రసాద మూర్తి (కలనేత కవితా సంపుటి నుండి)	**1,2,3 & 4**	**12**
యూనిట్ – II : కథానిక **5.తెలుగు కథానిక-** పరిచయం **6.భయం(కథ)-**కాళీపట్నం రామారావు **7.స్వేదం ఖరీదు...?-** రెంటాల నాగేశ్వరరావు	**1, 2, 3 & 4**	**12**
యూనిట్ – III : నవల **8.తెలుగు నవల-** పరిచయం **9.రథచక్రాలు(నవల)–** మహీధరరామ్మోహనరావు **(సంక్షిప్త ఇతివృత్తం మాత్రం)** **10.రథచక్రాలు - సమీక్ష(వ్యాసం)-** -డాIIయల్లాప్రగడ మల్లికార్జునరావు	**1, 2, 3 & 4**	**12**
యూనిట్-IV : నాటకం	**1, 2, 3**	**12**

11.తెలుగు నాటకం- పరిచయం **12.యక్షగానము(నాటిక)–ఎం. వి. ఎస్. హరనాథరావు** **13.అపురూప కళారూపాల విధ్వంస దృశ్యం'యక్షగానం'-** డా॥కందిమళ్ళ సాంబశివరావు	**& 4**	
<u>యూనిట్- V : విమర్శ</u> - డా॥నాగభైరవ ఆదినారాయణ **14.తెలుగు సాహిత్య విమర్శ -** పరిచయం **15.విమర్శ - స్వరూప స్వభావాలు ; ఉత్తమ విమర్శకుడు - లక్షణాలు ; విమర్శ - భేదాలు**	**1, 2, 3 & 4**	**12**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	**WEIGHTAGE (Marks)**
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
1.ఆధునిక కవిత్వ ఆరంభ వికాసాల్ని తెలపండి?	2 & 4	Remembering and Understanding
2. 'తాతకో నూలుపోగు' పాఠ్యభాగ సారాంశమును గురించి రాయండి?	3 & 4	Analyzing and Evaluating
3.కథానిక ఆవిర్భావ వికాసాల్ని వివరించండి?	3&4	Analyzing&Evaluating
1. ఆధునిక కవిత్వ లక్షణాల్ని రాయండి ?	1, 2 & 4	Understanding
2. దువ్వూరి రామిరెడ్డి'ని గురించి రాయండి ?	1 & 4	Remembering

3. అనిశెట్టి సుబ్బారావును పరిచయం చేయండి?	1 & 4	Remembering
4. బండారు ప్రసాదమూర్తిని గురించి తెలపండి?	3 & 4	Understanding and analyzing
5. తెలుగు కథానికను పరిచయం చేయండి	3 & 4	Understanding and analyzing
6. తెలుగు కథానిక లక్షణాల్ని తెలపండి?	3 & 4	Applying
7. కాళీపట్నం రామారావు ని పరిచయం చేయండి?	3 & 4	Remembering
1.కొండవీడు పాఠ్య భాగము ఎందులోనుండి తీసుకున్నారు?	1	Remembering
2.అనిశెట్టి సుబ్బారావు రాసిన పాఠ్యాంశం పేరు?	1	Remembering
3.తాతకో నూలుపోగు ఏ కవితా సంపుటి నుండి తీసుకున్నారు?	2	Applying
4.దువ్వూరి రామిరెడ్డి బిరుదు ?	2	Applying
5.అభ్యుదయ కవితకు పునాది ?	2	Understanding
6.స్వేదం ఖరీదు పాఠం రచయిత ?	1 & 2	Remembering
7.కాళీపట్నం రామారావు రాసిన కథ పేరేమి ?	1 & 4	Remembering and applying
8.కథ లక్షణం ఒకటి?	1	Remembering
9.కవిత లక్షణం ఒకటి?	1	Remembering
10.బండారు ప్రసాదమూర్తి ఏ ఊరు?	1	Remembering

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
థచక్రాలు నవలలోని ముఖ్య పాత్ర * a.నిత్యానందం b.సత్యానందం c.ఆత్మానందం d.సత్య వేదం అరిస్టాటిల్ నాటకానికి ఎన్ని లక్షణాలు చెప్పాడు ?*	1	Remembering and Understanding
ఆచార్య SV రామారావు రాసిన పుస్తకం పేరేమి?*	1	Remembering

a.సాహిత్య్ా దర్శనం b.ఆంధ్ర సాహిత్య విమర్శ ఆంగ్ల ప్రభావం c.తెలుగులో సాహిత్య విమర్శ d.ఆంధ్ర కవుల చరిత్ర		
"అపురూప కళా రూపాల విధ్వంస దృశ్యం యక్షగానం" పాఠం రాసిందెవరు?* a.హరనాథరావు b.యల్లాప్రగడ మల్లికార్జున రావు c.కందిమల్ల సాంబశివరావు d.ఎవరు కాదు	1 & 2	Remembering and Understanding
విశ్వం ఎవరి కొడుకు * a.సత్యానందం b.భద్ర c.జానకి d.దీవాన్	1 & 2	Remembering and Understanding
ఈకింది వానిలో ఏది ఉత్తమ విమర్శకుని లక్షణం కాదు ? a.పక్షపాతం b. సహృదయత c.సత్య ప్రకటన d.సమదర్శనం	1 & 2	Remembering and Understanding
ఆలంకారిక విమర్శకున్న మరొక పేరు?* a.మనస్తత్వ విమర్శ b.లాక్షణిక విమర్శ c.నైతిక విమర్శ d. స్వతంత్ర విమర్శ	1 & 2	Remembering and Understanding
శంభూక వధ నాటక రచయిత * 1.త్రిపురనేని 2.అక్కినేని 3.భీమినేని 4.కేశినేని	1	Remembering
యం.వి.యస్.హరనాథ రావు రాసిన పాఠం పేరేమి ?* a.యక్షగానం b.నవల c.నాటకం d.కథానిక	2	Remembering and Understanding
సమకాలీన జీవితానికి దర్పణం* aకవిత్వం bవిమర్శ cకథానిక d నవల	1	Remembering
యక్షగానంలోని హాస్య పాత్ర పేరు * a.భట్టు b.కేతిగాడు c.యక్షుడు d.ప్రహ్లాదుడు	3	Applying
కప్పి చెబితే కవిత్వం విప్పి చెబితే విమర్శ అన్నదెవరు ?* sv రామారావు b.దివాకర్ల వేంకటావధాని c.పింగళి లక్ష్మీకాంతం d.సింగిరెడ్డి నారాయణరెడ్డి	1	Remembering

రథ చక్రాలు నవలా రచయిత * a.బుచ్చిబాబు b.గోపిచంద్ c.మహీధర రామ్మోహన రావు d.చలం	4	Applying
విమర్శని ఆంగ్లంలో ఏమంటారు ?* a. Criticism d.Romanticism c.Patriotism d.Marxism	3	
కన్యాశుల్కం నాటక రచయిత * a.గురజాడ b.శ్రీ శ్రీ c.చలం d.కృష్ణశాస్త్రి	4	

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	ఆధునిక కవిత్వ ఆవిర్భావ వికాసాలను వివరించండి?	Understanding
2	'కొండవీడు'లోదువ్వూరిరామిరెడ్డిసందేశాన్నివివరించండి?	Remembering and understanding
3	అనిశెట్టిసుబ్బారావు మాతృ సంగీతాన్ని తెలపండి.?	Understanding and analyzing
4	తాతకో నులుపోగు ద్వారా బండారు ప్రసాద్ మూర్తి నేతగాని స్థితిని ఎలా వర్ణించారు?	Remembering
5	తెలుగుకథానికనుపరిచయంచేసికథానికాలక్షణాలనుతెలపండి ?	Remembering
6	భయం"కథలోని రచయిత సందేశాన్ని రాయండి(లేదా)"భయం" కథ ద్వారా రచయిత సమాజానికిచ్చిన సందేశం ఏమిటి?	Understanding and evaluation
7	"స్వేదంఖరీదు"ఇతివృత్తాన్నితెలుపండి(లేదా) " స్వేదంఖరీదు"కథా అంశాన్నితెలియజేయండి	Remembering
8	నవల ఆవిర్భావ వికాసాలను తెలపండి ?	Remembering
9	తెలుగునాటకంలో అభ్యుదయ తెలుగు నాటక లక్షణాలు	Remembering and evaluation
10	యక్షగానం నాటికపై సమీక్ష వ్యాసం రాయండి.	Remembering

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level

1	Chart preparation and Teach back session	Understanding and Analysis
2	**Debate on ఆధునిక సాహిత్య అధ్యయనం ఆవసరమా? అనవసరమా?**	Covering Lower and Higher order thinking skills
3	Clean and Green	Covering Lower and Higher order thinking skills
4	స్టూడెంట్ సెమినార్స్ Students Seminars	Covering Lower and Higher order thinking skills
5	పదాలతో అంత్యాక్షరి Padalato Antyakshari	Covering Lower and Higher order thinking skills
6	**ONLINE QUIZ**	

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1
CO1	3	3	3			3	3	3	3
CO2	3	3	3		3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3		3

CO Attainments (Direct and Indirect)

CO	DIRECT	INDIRECT	Total CO Attainment
CO1	62.1	95	65.39
CO2	62.1	95	65.39
CO3	62.1	95	65.39
CO4	62.1	95	65.39
CO5	62.1	97.5	65.64

PO and PSO Attainment (Direct and Indirect)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1
CO1	65.14	65.14	65.14			65.14	65.14		65.14
CO2	64.89	64.89	64.89		64.89	64.89	64.89	64.89	64.89
CO3	65.14	65.14	65.14	65.14	65.14	65.14	65.14	65.14	65.14
CO4	65.14	65.14	65.14	65.14	65.14	65.14	65.14	65.14	65.14
CO5	65.14	65.14	65.14	65.14	65.14	65.14	65.14	65.14	65.14

CO's attainment is good, try to improve further

Signature of the Program Coordinator
Lecturer in charge
Dept of Chemistry

ENGLISH PAPER II - A Course In Reading & Writing Skills

PROGRAM: MPC **YEAR: I** **SEMESTER: 2**

COURSE: ENGLISH **CREDITS: 3** **HOURS: 4**

COURSE OBJECTIVES

CO1 To comprehend different texts while reading

CO2 To build up a repository of vocabulary

CO3 To use writing skills in future needs for any purpose.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: Prose:1. How to Avoid Foolish Opinions Bertrand Russell Skills: 2. Vocabulary: Conversion of Words 3. One Word Substitutes : 4. Collocations	**1,2 &3**	**10**
UNIT II: Prose: 1. The Doll's House Katherine Mansfield Poetry: 2. Ode to the West Wind P B Shelley Non-Detailed Text : 3. Florence Nightingale Abrar Mohsin Skills : 4. Skimming and Scanning.	**1, 2**	**15**
UNIT III: Prose:1. The Night Train at Deoli Ruskin Bond Poetry: 2. Upagupta Rabindranath Tagore Skills : 3. Reading Comprehension : 4. Note Making/Taking	**1,2& 3**	**15**
UNIT IV: Poetry: 1. Coromandel Fishers Sarojini Naidu Skills:2. Expansion of Ideas: 3. Notices, Agendas and Minutes	**1,2& 3**	**10**
UNIT V: Non-Detailed Text:1. An Astrologer's Day R K Narayan Skills: 2. Curriculum Vitae and Resume: 3. Letters: 4. E-Correspondence	**1,2& 3**	**10**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	WEIGHTAGE (Marks)
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	Course Objective	Bloom's Taxonomy Level
How to Avoid Foolish Opinions.	2	Remembering and Understanding
The Doll's House	3	Analyzing and Evaluating
One Word Substitutes	3	Remembering and applying
Fill in the blanks with the given words	1, 2	Understanding and Applying

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
.fill in the blanks with the given words	12 & 3	Understanding and applying
Read the passage and answer the questions	1 &3	Understanding and analyzing

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	How to Avoid Foolish Opinions.	Remembering and understanding
2	Write about 'The Doll's House'	Remembering and understanding
3	Upagupta	Remembering and understanding
4	Night Train at Deoli	Remembering and understanding
5	Make a note of the following	Understanding and applying
6	Resume writing	Understanding and Evaluating

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Group Discussion on 'Measures to Avoid Covid-19'	Understanding, Analyzing and thinking Skills
2	Online Quiz on 'How to Avoid Foolish Opinions'.	Understanding and Evaluating
3	Online Quiz on 'Upagupta'	Understanding and Evaluating
4	Online Quiz on 'Night Train at Deoli'	Understanding and Evaluating
5	Online Quiz on 'The Doll's House'	Understanding and Evaluating
	Online Quiz on 'Coromandel Fishers'	Understanding and Evaluating
	Online Quiz on 'Ode to West Wind'	Understanding and Evaluating
	Online Quiz on 'An Astrologer's Day'	Understanding and Evaluating

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/ PSO	PO 1	PO 2	PO 3	PO 5	PO 6	PO 7	PSO 1
CO 1	3	3	3			3	3
CO 2		3	3			3	3
CO 3			3	3	3	3	3

CO Attainments (Direct and Indirect)

CO	Direct	Indirect	Total CO Attainment
CO 1	56.38	86.54	59.40
CO 2	56.10	88.46	59.33
CO 3	55.58	90.38	59.06

PO and PSO Attainment (Direct and Indirect)

	PO 1	PO 2	PO 3	PO 5	PO 6	PO 7	PSO 1
	3	3	3	3	3	3	3
CO 1	59.40	59.40	59.40			59.40	59.40
CO 2		59.33	59.33			59.33	59.33
CO 3			59.06	59.06	59.06	59.06	59.06
PO Attainment	59.38	59.37	59.29	59.06	59.06	59.26	59.29

CO's attainment is nearer to bench mark, try to improve it further

Signature of the Program Coordinator

Lecturer in charge
Dept of Chemistry

MATHEMATICS PAPER II - THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY

PROGRAM: B.SC(MPC) **YEAR: I** **SEMESTER: 2**

COURSE: CORE **CREDITS: 5** **HOURS: 6**

COURSE OBJECTIVES

CO1. get the knowledge of planes.

CO2. basic idea of lines, sphere and cones.

CO3. understand the properties of planes, lines, spheres and cones.

CO4. express the problems geometrically and then to get the solution.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: The Plane: Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes, Combined equation of two planes, Orthogonal projection on a plane.	**1,3 & 4**	**12**
UNIT II: The Line :Equation of a line; Angle between a line and a plane; The condition that a given line may lie in a given plane; The condition that two given lines are coplanar; Number of arbitrary constants in the equations of straight line; Sets of conditions which determine a line; The shortest distance between two lines; The length and equations of the line of shortest distance between two straight lines; Length of the perpendicular from a given point to a given line.	**2, 3 & 4**	**12**
UNIT III: The Sphere :Definition and equation of the sphere; Equation of the sphere through four given points; Plane sections of a sphere; Intersection of two spheres; Equation of a circle; Sphere through a given circle; Intersection of a sphere and a line; Power of a point; Tangent plane; Plane of contact; Polar plane; Pole of a Plane; Conjugate points; Conjugate planes;	**2, 3 & 4**	**12**
UNIT IV: The Sphere and Cones : Angle of intersection of two spheres; Conditions for two spheres to be orthogonal;	**2, 3 & 4**	**12**

Radical plane; Coaxial system of spheres. Limiting Points. Definitions of a cone; vertex; guiding curve; generators; Equation of the cone with a given vertex and guiding curve; equations of cones with vertex at origin are homogenous; Condition that the general equation of the second degree should represent a cone;		
UNIT V: Cones :Enveloping cone of a sphere; right circular cone: equation of the right circular cone with a given vertex, axis and semi vertical angle: Condition that a cone may have three mutually perpendicular generators; intersection of a line and a quadric cone; Tangent lines and tangent plane at a point; Condition that a plane may touch a cone; Reciprocal cones; Intersection of two cones with a common vertex.	**2, 3 & 4**	**12**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	**WEIGHTAGE (Marks)**
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
A variable plane is at a constant distance 3p from the origin and meets axis A,B,C . Show that the locus of the centroid of a triangleABC is x^(-2)+y^(-2)+z^(-2)=p^(-2).	1,3 & 4	Remembering, Understand and Applying
Find the bisecting plane of the acute angle b/w planes 3x-2y-6z+2=0, -2x+y+2z-2=0.	1,3 & 4	Remembering, Applying and Analyzing

S.T (1,3,-2) is the point of intersection of a line (x+1)/1=(y+3)/3=(z-2)/2 to the plane 3x+4y+5z-5=0	1,2,3 & 4	Remembering and Applying
Find the angle between the planes 2x-3y+4z-11=0,3x-2y-3z+27=0	1, 2 & 4	Remembering and Applying
S.T the following point are co planner (-6,3,2),(-13,17,-1),(3,-2,4),(5,7,3)	1 & 4	Remembering and Applying
Find the equations of the plane passing through (1,0,-2) and perpendicular to the plane 2x+y-z-2=0;x-y-z-3=0	1 & 4	Remembering and Applying
P.T the equation 2x^2-6y^2-12z^2+18yz+2zx+xy=0 represent a pair of planes	1 & 4	Remembering and Applying
Find the angle b/w the line (x-1)/-3=(y-2)/2=(z-3)/2 & (x-1)/3=(y-5)/1=z/-5.	2,3 & 4	Remembering and Applying
Find the image of the point (2,-1,3) to the plane 3x-2y+z-9=0	1 & 4	Remembering, Applying and Analyzing
P.T the points (1,2,3),(4,0,4)(-2,4,2),(7,-2,5) are collinear.	2,3 & 4	Remembering and Applying
Angle between two planes is _____	1 & 3	Remembering
The distance b/w the parallel planes ax+by+cz+d1=0, ax+by+cz+d2=o is _____	1 & 3	Remembering
Equation of the plane making intercepts a,b,c on the co - ordinate axis is_____	1 & 3	Remembering
Distance of the origin from the plane ax+by+cz+d=0 is _____	1 & 3	Remembering
Condition from H=0 represents the equation of the pair of planes is_____	1 & 3	Remembering
If θ is the angle b/w the pair of planes H=0 then_____	1 & 3	Remembering
Equation of the line through the point (x,y,z) and dr's (l,m,n) in symmetric form_____	2 & 3	Remembering
(y-y1)/m=(z-z1)/n represents the plane through perpendicular to_____	1 & 3	Remembering

Condition for perpendicular planes is_____-	1 & 3	Remembering

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
Find the equation of a plane which is parallel to the planes (y/b)+(z/c)=1, x=0. And PT the distance between two planes is (1/d^2)=(1/a^2)+(1/b^2)+(1/c^2)	1, 3, & 4	Remembering and Applying
Find the equation of the sphere whose axis is passing through the origin. ST the condition through the intercept plane is 4r^2=(x^2+y^2+z^2)^2(x^(-2)+y^(-2)+z^(-2))	1, 2, 3, & 4	Remembering and Applying
Find the pole of the plane x-y+5z=a and whose sphere is x^2+y^2+z^2=9	1, 2, 3 & 4	Remembering and Applying
Find the radius of the sphere 2x^2+2y^2+2z^2-2x+4y+2z+1=0	2, 3, & 4	Remembering and Applying

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	Find the angle between the planes 2x-y+z=0 x+y+2z=7 A variable plane is at constant distance p from the origin and meets the coordinate axis O,A,B,C. S T the locus of the tetrahedron OABC is x^(-2)+y^(-2)+z^(-2)=16p^(-2)..	Remembering, Understanding and Applying.
2	Show that the four points are coplanar (-6,3,2) (-13,17,-1) (3,-2,4) (5,7,3). Find the locus of the point whose distance from the origin is 3 times is distance from the plane 2x-y+2z=3	Remembering, Understanding and Applying.
3	Find the equation of the plane through (4,4,0) and perpendicular to the plane x=2y+2z=5 and 3x+3y+2z-8=0 ST the equation of the plane through the points (1,-2,4) (3,-4,5) and perpendicular to XY-plane is x+y+1=0	Remembering, Understanding and Applying.
4	PT the equations of the plane passing through the points (1,-2,4) (3,-4,5) and parallel to the X-axis is	Remembering, Understanding and Applying.

	y+2z=6 If P is the point such that the sum of the squares of it is distance from the plane x+y+=0, x+y-2z=0, x-y=0 is 5. ST locus of P is x^2+y^2+z^2=5	
5	Find the equation of the plane passing through (1,0,-2) and perpendicular to the plane 2x+y-z=0, x-y-z=3 Find the equation of the plane through the points (2,2,1) (9,3,6) perpendicular to the plane 2x+6y+6z=9	Remembering, Understanding and Applying.
6	Find the equation of the plane to the intersection of plane x+3y+6=0 & 3x-y-4z=0 such that the perpendicular distance of each from the origin is unity. If x+2y+3z+4=0 & 4x+3y+3z+1=0 are two planes. Find the equation of the plane is perpendicular to the plane x+y+z+9=0	Remembering, Understanding and Applying.
7	Find the equation of the plane bisecting the plane point of the plane is acute angle 3x-6y+2z+5=0, 4x-12y+3z-2+0.	Remembering, Understanding and Applying.
8	If H=2x^2-6y^2-12z^2+18yz+2zx+xy=0 represents a pair of planes and angle between the pair of planes.	Remembering, Understanding and Applying.
9	Find the point of intersection of the line (x-1)/(-3)=(y-1)/2=(z-3)/2 and (x-1)/3=(y-1)/2=(z-3)/2	Remembering, Understanding and Applying.
10	If r1,r2 are the radius of two orthogonal spheres then the radius of the circle of intersection is (r1.r2)/√(r1^2+r2^2).	Remembering, Understanding and Applying.

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Student seminar on Angle between two planes.	Remembering, Understanding, Applying and Analysis
2	Clean and Green	Understanding
3	Quiz on three dimensional solid geometry.	Remembering and Understanding

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/PSO	PO 1	PO 2	PO 5	PO 6	PSO 2	PSO 3
CO 1		3	3		3	
CO 2	3	3	3	3	3	3
CO 3	3	3	3	3	3	3
CO 4		3	3	3	3	

CO Attainments (Direct and Indirect)

CO	Direct	Indirect	Total CO Attainment
CO 1	58.61	97.50	62.50
CO 2	58.38	95.00	62.04
CO 3	58.61	95.00	62.25
CO 4	58.71	87.50	61.59

PO and PSO Attainment (Direct and Indirect)

	PO 1	PO 2	PO 5	PO 6	PSO 2	PSO 3
	3	3	3	3	3	3
CO 1		62.50	62.50		62.50	
CO 2	62.04	62.04	62.04	62.04	62.04	62.04
CO 3	62.25	62.25	62.25	62.25	62.25	62.25
CO 4		61.59	61.59	61.59	61.59	
PO Attainment	62.15	62.10	62.10	61.96	62.10	62.15

CO's attainment is good, try to improve further

Signature of the Program Coordinator

Lecturer in Chem
Dept of Chemistry

PHYSICS PAPER II: WAVE OPTICS

PROGRAM: B SC MATHS, PHYSICS & CHEMISTRY YEAR: I
SEMESTER 2
COURSE: CORE CREDITS: 4+1 HOURS: 4+2

COURSE OBJECTIVES

CO1 ● Understand the nature of light and principles of Laser and holography.

CO2 ● Analyze the intensity variation of light due to interference, diffraction and polarization.

CO3 ● Solve problems in Optics by selecting the appropriate equations and performing numerical or analytical calculations.

CO4 ● Students are able to operate optical devices including polarizers, interferometers, and Lasers.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: : Interference of light: (12hrs) Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude, Phase change on reflection- Stokes' treatment, Lloyd's single mirror, Interference in thin films: Plane parallel and wedge- shaped films, colours in thin films, Newton's rings in reflected light-Theory and experiment, Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength	**1,2,3 & 4**	**12**
UNIT II:. Diffraction of light:(12hrs) Introduction, Types of diffraction: Fresnel and Fraunhoffer diffractions, Distinction between Fresnel and Fraunhoffer diffraction,Fraunhoffer diffraction at a single slit, Plane diffraction grating, Determination of wavelength of light using diffraction grating, Resolving power of grating, Fresnel's half period zones, Explanation of rectilinear propagation of light, Zone plate, comparison of zone plate with convex lens	**1, 2, 3 & 4**	**12**
UNIT III : Polarisation of light:(12hrs) Polarized light: Methods of production of plane polarized light, Double refraction, Brewster's law, Malus law, Nicola prism, Nicola prism as polarizer and analyzer, Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light-Production and detection, Optical activity, Laurent's half shade polar meter: determination of specific rotation.	**1, 2, 3 & 4**	**12**
UNIT IV. : Aberrations and Fibre Optics: (12hrs) Monochromatic aberrations, Spherical aberration, Methods of minimizing spherical aberration, Coma, Astigmatism and Curvature of field, Distortion; Chromatic aberration-the achromatic doublet; Achromatise for two lenses (i) in contact and (ii) separated by a distance. Fibre optics: Introduction to Fibbers, different types of fibbers, rays and modes in an optical fiber, Principles of fibre communication (qualitative treatment only), Advantages of fibre optic communication.	**1, 2, 3 & 4**	**12**

UNIT V: : Lasers and Holography:(12hrs) Lasers: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers; Holography: Basic principle of holography, Applications of holography	**1, 2, 3 & 4**	**12**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	**WEIGHTAGE (Marks)**
MID I (20 Marks)	TOTAL 50 Marks SCALE DOWN TO 25 Marks
MID II (15 Marks)	
ASSIGNMENTS (5 Marks)	
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Explain the defects coma and astigmatism in a lens. How are they minimized?	**1, 2, 3 & 4**	Remembering and Understanding
Distinguish between Fresnel and Fraunhoffer diffractions	**1, 2, 3 & 4**	Analyzing and Evaluating
What are quarter and half wave plates?	**1, 2, 3 & 4**	Analyzing
What is chromatic aberration?	**1, 2, 3 & 4**	Understanding
Obtain an expression for the chromatic aberration of a lens	**1, 2, 3 & 4**	Remembering
Explain spherical aberration. Describe minimization techniques	**1, 2, 3 & 4**	Remembering
How are Newton's rings formed ?	**1, 2, 3 & 4**	Understanding and analyzing
Describe Newton's rings experiment to determine the wave length of a monochromatic light.	**1, 2, 3 & 4**	Remembering
Explain how to determine thickness of given thin wire by forming wedge shaped film	**1, 2, 3 & 4**	Remembering

MID II Questions

Question	Course Objective	Bloom's Taxonomy Level
❖ What is a zone plate ?	**1, 2, 3 & 4**	Remembering and Understanding
Describe its action. Explain how a zone plate acts like a convergent lens having multiple foci	**1, 2, 3 & 4**	Remembering
❖ Explain diffraction of light due to single slit.	**1, 2, 3 & 4**	Remembering and Understanding
❖ Describe the construction and working of a Nichol prism. Give any method of producing plane polarized light	**1, 2, 3 & 4**	Remembering and Understanding
❖ Define optical activity.	**1, 2, 3 & 4**	Remembering and Understanding
❖ Describe how the specific rotation of given optically active substance using laurant's half shaded polar meter	**1, 2, 3 & 4**	Remembering and Understanding
❖ Explain construction and working of He-Ne laser.	**1, 2, 3 & 4**	Remembering
❖ A 15 cm tube containing cane sugar solution shows optical rotation 70. Calculate the strength of the solution	**1, 2, 3 & 4**	Applying

Assignments

S. No.	Topic	Bloom's Taxonomy Level
1	Explain the defects coma and astigmatism in a lens. How are they minimized?	Understanding
2	Distinguish between Fresnel and Fraunhoffer diffractions	Remembering and understanding
3	What are quarter and half wave plates?	Understanding and analyzing
4	What is chromatic aberration?	Remembering
5	Obtain an expression for the chromatic aberration of a lens	Remembering
6	Explain spherical aberration. Describe minimization techniques	Understanding and evaluation
7	How are Newton's rings formed ?	Remembering
8	❖ Describe how the specific rotation of given optically active substance using laurant's half shaded polar meter	Remembering

9	❖ Explain construction and working of He-Ne laser.	Remembering and evaluation
10	What is a zone plate	Remembering

Classroom Activities

S. No.	Activity and Topic	Bloom's Taxonomy Level
1	Student seminar diffraction of light	Understanding and Analysis
2	Group Discussion chromatic aberration	Covering Lower and Higher order thinking skills
3	Clean and Green	Covering Lower and Higher order thinking skills
4	Quiz on Motion in a Newton's rings	Covering Lower and Higher order thinking skills
5	Student Study Project on coma and astigmatism	Covering Lower and Higher order thinking skills

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/ PSO	PO 1	PO 2	PO 3	PO 5	PO 6	PO 7	PSO 1
CO 1	3	3	3				3
CO 2	3	3	3				3
CO 3	3	3	3				3
CO 4	3	3	3				3

CO Attainments (Direct and Indirect)

CO	DIRECT	INDIRECT	Total CO Attainment
CO1	65.89	90.00	68.30
CO2	65.89	90.00	68.30
CO3	65.89	90.00	68.30
CO4	65.8875	85	67.7988

PO and PSO Attainment (Direct and Indirect)

	PO1	PO2	PO3	PSO1
CO1	68.30	68.30	68.30	68.30
CO2	68.30	68.30	68.30	68.30
CO3	68.30	68.30	68.30	68.30
CO4	67.80	67.80	67.80	67.80
PO Attainment	68.17	68.17	68.17	68.17

CO's attainment is good, try to improve further

Signature of the Program Coordinator

Lecturer in charge,
Dept of chemistry

CHEMISTRY PAPER II: Organic & General Chemistry

PROGRAM: B.Sc(MPC) **YEAR: I** **SEMESTER: 2**

COURSE: II **CREDITS: 4 + 1** **HOURS: 4+2**

COURSE OBJECTIVES

CO1 Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved

CO2 Learn and identify many organic reaction mechanisms.

CO3 Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophonic Addition and Electrophonic Aromatic Substitution.

CO4 Correlate and describe the stereochemical properties of organic compounds and reactions.

CO5 Learn and identify the concepts of a standard solutions, primary and secondary standards. Facilitate the learner to make solutions of various molar concentrations.

COURSE CONTENTS

CONTENT	CO	HOURS
UNIT I: ORGANIC CHEMISTRY: Recapitulation of Basics of Organic Chemistry Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes) General methods of preparation of alkanes- Wurtz and Wurtz-Fittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties, Free radical substitutions; Halogenations, concept of relative reactivity v/s selectivity. Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane) General molecular formulae of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane conformations with energy diagram, Conformations of monosubstituted cyclohexane.	**1,2,3**	**12**
UNIT II: Carbon-Carbon pi Bonds(Alkenes and Alkynes) General methods of preparation, physical and chemical properties. Mechanism of E1, E2, E1 cb reactions, Saytzeff and Hofmann eliminations, Electrophilic Additions ,mechanism (Markovnikov/Anti Markovnikov addition) with suitable examples,, syn and anti-addition; additionofH2,X2, HX. Oxymercuration, demercuration, hydroboration-oxidation, ozonolysis, hydroxylation, Diels Alderreaction,1,2- and1,4-addition reactions in conjugated dienes. Reactions of alkynes; acidity, electrophilic and nucleophilic additions, hydration to form carbonyl compounds,	**1, 2, 3**	**12**

Alkylation of terminal alkynes.		
UNIT III: Benzene and its reactivity Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation) Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel- Craft's alkylation and acylation. Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO2 and Phenolic). Orientation of i. Amino, methoxy and methyl groups ii. Carboxy, nitro, nitrile, carbonyl and sulfonic acid groups iii. Halogens (Explanation by taking minimum of one example from each type)	**1, 2, 3**	**12**
UNIT IV: GENERAL CHEMISTRY 1. Surface chemistry and chemical bonding Surface chemistry Colloids- Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number. Adsorption- Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption. 2. Chemical Bonding Valence bond theory, hybridization, VB theory as applied to ClF3,Ni(CO)4, Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules(N2,O2,CO and NO). 3. HSAB Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.	**1,4**	**12**
UNIT V: Stereochemistry of carbon compounds Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. Chiral molecules- definition and criteria (Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples- Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane. D,L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)	**1, 4**	**12**
Volumetric Analysis Lab Use glassware, equipment and chemicals and follow experimental procedures in the laboratory • Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibria • Learn and identify the concepts of a standard solutions, primary and secondary standards • Facilitate the learner to make solutions of various molar concentrations. • This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.	**5**	**30**

ASSESSMENT/EVALUATION METHODS

ASSESSMENT TOOL	WEIGHTAGE (Marks)
MID I (20 Marks)	TOTAL 50 Marks
MID II (15 Marks)	

ASSIGNMENTS (5 Marks)	SCALE DOWN TO 25 Marks
CLASSROOM ACTIVITIES (5 Marks)	
CLEAN & GREEN ACTIVITIES (5 Marks)	
FINAL EXAMINATION	75 Marks
TOTAL	**100**

MID I Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Explain Bayer's strain theory OR Write the preparation of alkanes	1,2& 3	Remembering and Understanding
Write the Diels alder reaction with examples	3 & 4	Analyzing and Evaluating
Explain the conformations of butane and write its stability order	1&3	Analyzing
Explain Saytzev's rule with example	1, 2 & 3	Understanding
Write Markonikov's rule with eg	1 & 3	Remembering
Write the reaction of ozonolysis	1 & 3	Remembering
Write the free radical substitution in alkanes	3	Understanding and analyzing
Explain Anti Markonikov's rule	1&2	Remembering
How many carbon atoms are in butane A. 4 B. 6 C. 8 D.10	1&2	Remembering
What is suffix for hydrocarbon with single bond A. Yne B. ene C ane D. one	1&2	Remembering
What is the first step of halogenation of alkanes A. homolytic cleavage B. heterolytic cleavage C. propagation D termination	1&2	Remembering
Identify the addition reaction which is not	1&2	Remembering

underdone by alkenes A. mercurization B. oxy mercurization C. Hydroboration D. Halogenation		
Chemical formula of ethane A. C3H8 B. C4H10 C. C2H6 D.CH4	2	Applying
Both alkanes and alkenes are A. saturated B. unsaturated C. HC D. Inorganic compounds	2	Applying
Write the structure of ethene	2	Understanding
CH2 = CH2 + H2 --→	1 & 2	Remembering
Alkanes are also called as	1 & 3	Remembering and applying
Which is the alkane that is used as fuel for cigarette lighter A. Ethane B. Methane C Butane D Pentane	1&2	Remembering and applying

MID II Questions

Question	**Course Objective**	**Bloom's Taxonomy Level**
Explain langmuir adsorption isotherm	4	Remembering and Understanding
What is LCAO and draw MO diagram for O2,CO	1 .2	Remembering
Write about D,L configuration	4	Understanding and apply
Explain R,S configuration	4	Understanding and apply
Write about resolution method	4	Understanding and apply

Assignments

S. No.	**Topic**	**Bloom's Taxonomy Level**
1	Explain Bayers strain theory	Understanding

	Explain the mechanism of halogenation	
2	Exlain about markownikovs and anti markonikovs rule.	Remembering and understanding
3	Explain aromaticity of benzene Explain AES reaction in benzene with mechanism	Understanding and analyzing
4	What is LCAO and draw MO diagram for O2.N2,CO,NO	Remembering
5	Write about D,L configuration Explain R,S configuration	Remembering
6	Explain E,Z configuration with eg Write about resolution method	Understanding and evaluation

Classroom Activities

S. No.	**Activity and Topic**	**Bloom's Taxonomy Level**
1	Student seminars	Understanding and Analysis
2	Cross word puzzle	Applying, Analyzing and Evaluating
3	Clean and Green	Understanding
4	Google Quiz	Remembering, Understanding and Applying
5	Student seminars	Understanding and Analysis

Mapping of Course Outcomes with program and Program Specific Outcomes (CO, PO & PSO Matrix)

CO/PO/ PSO	PO 1	PO 2	PO 3	PO 5	PO 6	PSO 1	PSO 2
CO 1	3					3	
CO 2		3				3	
CO 3				3	3		3
CO 4			3				3
CO 5						3	3

CO Attainments (Direct and Indirect)

CO	DIRECT	INDIRECT	Total CO Attainment
CO1	66.19	90.00	68.57
CO2	66.58	92.50	69.17
CO3	66.64	90.00	68.97
CO4	66.28	92.50	68.90
CO5	66.29	95.00	69.16

PO and PSO Attainment (Direct and Indirect)

	PO1	PO2	PO3	PO5	PO6	PSO1	PSO2
CO1	68.57					68.57	
CO2		69.17				69.17	
CO3				68.97	68.97		68.97
CO4			68.90				68.90
CO5						69.16	69.16
CO6							
PO Attainment	68.57	69.17	68.90	68.97	68.97	68.95	69.03

CO's attainment is good, try to improve further

Signature of the Program Coordinator

Lecturer in Charge,
Dept. of Chemistry