St. FRANCIS COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD-500016
(An Autonomous College Affiliated To Osmania University)
FACULTY OF SCIENCE- DEPARTMENT OF CHEMISTRY
PRACTICAL SYLLABUS CBCS-2024
SEMESTER -IV
SYNTHESIS OF ORGANIC COMPOUNDS AND FUNCTIONAL GROUP ANALYSIS

Program: B.Sc.
Course Code: U24/CHE/DSC/401/P
Course: DSC-4
No. of Credits: 1

Max. Hours: 20 Hrs
Max. Marks: 50
Hours per week: 2

Course Objective

- To prepare simple organic compounds and systematically analyse functional groups based on their nature and chemical reactivity.

Course Outcomes

CO1: Utilise the knowledge of organic reaction mechanisms in their preparations.
CO2: Categorise functional groups present in organic compounds using systematic quantitative analysis.

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono functional groups (-COOH, phenolic, aldehydic, ketonic, carbohydrate, amide, nitro, amines) and preparation of one derivative.

Synthesis of organic compounds:

a. Acetylation – Preparation of Acetanilide.
b. Halogenation – Preparation of p-Bromo acetanilide.
c. Oxidation – Preparation of Benzoic acid.
d. Esterification - Preparation of n-butyl acetate.
e. Methylation – Preparation β-Naphthyl methyl ether.
f. Nitration – Preparation of Nitrobenzene
g. Reduction – Preparation of m-Nitroaniline

Reference Books:

- Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., *Textbook of Practical Organic Chemistry*, Prentice-Hall, 5th edition, 1996.
- Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry* Orient-Longman, 1960.
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry,* Universities Press.

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6. Syllabus Focus

a. Relevance to Local, Regional, National and Global Development Needs

Local /Regional/ National /Global Development Needs	Relevance
Local	Knowledge of the basic principles of Chemistry to help in day-to-day life.
Regional	Learn about the concepts and significance of carbohydrates and bioinorganic chemistry.
National	Understand the basics of organometallic compounds, non-aqueous solvents and dipole moments.
Global	Application of basic principles of rotational, IR, UV-Vis Spectroscopy techniques, concepts of chemical kinetics, heterocyclic compounds and pericyclic reactions.

b. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	Practical syllabus which includes Organic preparations and Qualitative analysis in Organic Chemistry Problem solving in Physical Chemistry	Students perform the experiments based on the procedure and also analyse the unknown compounds. Students solve the problems
ED	Organic preparations and analysis. Structural investigation of organic compounds based on spectroscopy	Students prepare organic compounds, analyse the functional groups and carry out the structural analysis based on spectral data
EMP	Inorganic, Organic, Physical Chemistry and Spectroscopy	Tutorials and assignments

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7. Pedagogy

S. No.	Student Centric Methods Adopted	Type / Description of Activity
1	Experiential	Experiments, attending seminars/workshops and field visits
2	Participative	Group discussion, quiz, presentations etc.
3	Problem solving	Solving problems in Physical Chemistry and structural elucidation based on spectral data.

8. Course Assessment Plan

a. Weightage of Marks in Continuous Internal Assessments & End Semester Examination

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination-60%
CO1	CIA1-Written Exam	Written Exam
CO2	CIA 2- Skill based test like poster/powerpoint presentation, collage, 3D model making, problem solving and quiz.	
CO3	CIA1-Written Exam	
CO4	CIA 2- Skill based test like poster/powerpoint presentation, collage, 3D model making, problem solving and quiz.	

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b. Model Question Paper - End Semester Exam

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Faculty of Science – Department of Chemistry

MODEL PAPER

B.Sc. II YEAR SEMESTER -IV

CHEMISTRY - PAPER IV

Course Code: U24/CHE/DSC/401

TIME: 2 hrs
Max. Marks: 60

SECTION –A (Essay Questions)

.Answer the following

4X10=40 Marks

1. a) Explain the classification of organometallic compounds based on metal-carbon bonds. (CO1) **L1** 5M
   b) Discuss the reactions in liquid ammonia with suitable examples. (CO1) **L2** 5M

OR

2. a) Describe the preparation, properties and applications of Grignard reagent. (CO1) **L3** 6M
   b) How does fixation of carbon dioxide occur in photosynthesis? (CO1) **L2** 4M
3. a) Derive an expression for the rate constant of first order reaction. (CO2) **L3** 5M
   b) A first order reaction is 50% complete in 100 minutes. How long will it take for 90% completion? (CO2) **L5** 5M

OR

4. Explain different methods of experimental determination of order oa a reaction. (CO2) **L2** 10M
5. a) Discuss the open chain structure of Glucose. (CO3) **L2** 5M
   b) Write the equations involved in Killiani-Fischer synthesis. (CO3) **L2** 5M

OR

6. a) Explain the synthesis of Furan, Pyrrole and Thiophene from 1,4-dicarbonyl compounds. (CO3) **L2** 5M
   b) What are pericyclic reactions? Give their classification with an example each. (CO3) **L4** 5M
7. a) What is a dipole moment? Predict the structure of CO_2 and SO_2 based on dipole moment. (CO4) **L4** 5M
   b) Explain the various molecular vibrations seen in IR spectroscopy. (CO4) **L2** 5M

OR

8. a) Describe in detail about the electronic transitions observed in UV-VIS spectroscopy. (CO4) **L2** 5M
   b) Explain the basic principles of Raman spectroscopy. (CO4) **L2** 5M

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SECTION –B

II. Answer any four. **4x5=20 Marks**

9. Write a note on the biological significance of calcium and chloride ions. (CO1) **L1**
10. Give two methods of preparation of ferrocene. (CO1) **L1**
11. Discuss briefly about collision theory. (CO2) **L2**
12. Explain the factors affecting the rate of a reaction. (CO2) **L2**
13. Explain mutarotation taking glucose as an example. (CO3) **L2**
14. Explain the concept of chromophore and auxochrome. (CO4) **L2**

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b. Model Question Paper - End Semester Exam

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(An Autonomous College Affiliated to Osmania University)
Faculty of Science – Department of Chemistry
B.SC. II YEAR SEMESTER -IV

TIME: 2 hrs
Max. Marks: 60

Course Code: U24/CHE/DSC/401
Credits: 4

SECTION –A (Essay Questions)
SECTION –A

SECTION A - INTERNAL CHOICE			**4 X 10 M = 40M**	
Question Number	**Question**		**CO**	**BTL**
1	**Module 1**	a) Explain the classification of organometallic compounds based on metal-carbon bonds. 5M b) Discuss the reactions in liquid ammonia with suitable examples. 5M **OR**	**CO 1**	**(Level I,II)**
2	**Module 1**	a) Describe the preparation, properties and applications of Grignard reagent. 6M b) How does fixation of carbon dioxide occur in photosynthesis? 4M	**CO 1**	**(Level III,II)**
3	**Module 2**	a) Derive an expression for the rate constant of first order reaction. 5M b) A first order reaction is 50% complete in 100 minutes. How long will it take for 90% completion? 5M **OR**	**CO 2**	**(Level III, V)**
4	**Module 2**	Explain different methods of experimental determination of order oa a reaction. 10M	**CO 2**	**(Level II)**
5	**Module 3**	a) Discuss the open chain structure of Glucose. 5M b) Write the equations involved in Killiani-Fischer synthesis. 5M **OR**	**CO 3**	**(Level II)**

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6	**Module 3**	a) Explain the synthesis of Furan, Pyrrole and Thiophene from 1,4-dicarbonyl compounds. (CO3) **L2** 5M b) What are pericyclic reactions? Give their classification with an example each. (CO3) 5M	**CO 3**	**(Level II, IV)**
7	**Module 4**	a) What is a dipole moment? Predict the structure of CO_2 and SO_2 based on dipole moment. 5M b) Explain the various molecular vibrations seen in IR spectroscopy. 5M **OR**	**CO 4**	**(Level II, IV)**
8	**Module 4**	a) Describe in detail about the electronic transitions observed in UV-VIS spectroscopy. 5M b) Explain the basic principles of Raman spectroscopy. 5M	**CO 4**	**(Level II)**
SECTION B - ANSWER ANY 4 OUT OF 6				**4 X 5M = 20 M**
9	**Module 2**	Write a note on the biological significance of calcium and chloride ions.	**CO 1**	**(Level I)**
10	**Module 1**	Give two methods of preparation of ferrocene.	**CO 1**	**(Level I)**
11	**Module 2**	Discuss briefly about collision theory.	**CO 2**	**(Level II)**
12	**Module 2**	Explain the factors affecting the rate of a reaction.	**CO 2**	**(Level II)**
13	**Module 3**	Explain mutarotation taking glucose as an example.	**CO 3**	**(Level II)**
14	**Module 4**	Explain the concept of chromophore and auxochrome.	**CO 4**	**(Level II)**

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DEPARTMENT OF NUTRITION

DSC- 1V	COMMUNITY NUTRITION SEMESTER- IV	60 HRS
Module 1 - Assessment of Nutritional Status **Module 2 - Nutritional Problems** **Module 3 - Nutrition and Health Education** **Module 4 - Mother and Child Care and Health Organizations**		

- The syllabus contains four Modules. Paper should give equal weightag e to all Modules. Four long questions- One question per module with internal choice

SEMESTER- IV

COMMUNITY NUTRITION

1. Course Description

Programme : B.Sc.
Course Code : U20/NUT/DSC/401
Course Type : DSC – 4
No. of credits : 4

Max. Hours : 60
Hours per week : 4
Max. Marks : 100

2. Course Objectives:

- Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of the community.
- It inculcates leadership qualities in conducting various extension and community outreach programs.

3. Course Outcomes:

After the successful completion of the course, the student will be able to

CO1: Create skills to conduct simple nutrition assessments
CO2: Evaluate and prevent common nutritional problems in India
CO3: Understand different nutritional tools in educating the community
CO4: Analyze the role of various government and non government agencies in combating malnutrition.

4. Course Content

MODULE 1 : ASSESSMENT OF NUTRITIONAL STATUS (15 hrs)

1.1. Introduction: Factors affecting Nutritional status, Methods of assessment, Anthropometry measurements

1.2 Biochemical Analysis, Clinical examination and Vital Statistics: Laboratory and Biochemical tests, Parameters for vital statistics, Mortality and morbidity.

1.3. Diet Survey: Individual, Institutional and national , uses and limitations.

MODULE 2: NUTRITIONAL PROBLEMS: (15 hrs)

2.1. Common nutritional problems in India: Protein Energy Malnutrition and Vitamin A deficiency- Etiology, Diagnosis, Treatment and Prophylaxis programme.

2.2. Anemia: Iron deficiency, folic acid deficiency and Vitamin-B12 deficiency- Etiology, Diagnosis ,Treatment and Prophylaxis programme

2.3. Iodine deficiency disorders: Etiology, Diagnosis, Treatment and Prophylaxis programme.

MODULE 3: NUTRITION AND HEALTH EDUCATION (15 hrs)

3.1. Importance of Nutrition and health education: Definition, Principles of health education components.

3.2. Tool and techniques of Health Education: Audio Aids, Visual aids Audio- Visual aids, Advantages and Disadvantages.

3.3. Types of approaches: Individual, Group and Mass, advantages and disadvantages.

MODULE 4: MOTHER AND CHILD CARE AND HEALTH ORGANIZATIONS (15 hrs)

4.1. Mother and child health: Primary Health care systems with special reference to maternal and child health, infant mortality, morbidity, primary health center functioning in rural areas (Anganwadi).

4.2. Inborn errors of metabolism: Types, causes, maintenance – Lactose intolerance, Glycogen storage disorder, Phenylketonuria, Maple syrup urine disorder.

4.3. International Agencies and National agencies: WHO, FAO, UNICEF, CARE, NIN, ICMR, CFTRI, NNMB, NSI

5. References

1. Chalkey M.A, 2014, A Textbook For The Health Worker, volume I, New Age International Publishers.
2. Park K, 2011, Preventive and Social Medicine, 21" edition, Banarsidas Bhanot Publishers.
3. Swaminathan M, 2014, Handbook of Food and Nutrition, BAPPCO Publishers, Bangalore.
4. Srilakshmi B, 2014, Nutrition Science, New Age International Publishers, New Delhi.
5. Begum R. M, 2014, A Textbook of Foods, Nutrition and Dietetics, 3rd revised edition, Sterling Publishers Pvt. Ltd New Delhi.
6. Bamji M.S, Krishnaswamy K and Brahman GNV, 2009, TextBook of Human Nutrition, 3rd edition, Oxford and IBH publishing Co Pvt Ltd, New Delhi.
7. ICMR, 2011, Dietary Guidelines For Indians, a manual, NIN.
8. WHO child growth standards, 2006, Methods and Development Height, University Press Oxford
9. Public Health Nutrition – Michale J. Gibney, Barrie M. Margetts, John M. Kearney and Lenore Arab (Eds.) – Nutrition Society Textbook Series, Blackwell Publishing.
10. The Management of Nutrition in Major Emergencies, WHO in collaboration with UNHCR, International Federation of Red Cross and Red Crescent societies and WFP.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Local	Learning how to assess personal nutritional status as well as of the community they are living in
National	Awareness about the major Nutritional problems of India
Global	Gaining knowledge about the usage of different tools and techniques to educate the masses about health and nutrition globally

SECTION A - INTERNAL CHOICE
5 Q X 10 M = 50 M

Question Number	Question	Question	CO	BTL (Blooms Taxonomy Level)
1	Module 1	Describe the Anthropometric methods of assessing Nutritional status in a community.	CO 1	I
2	Module 1	What are Diet surveys? Discuss the uses and limitations of Diet surveys.	CO 1	I
3	Module 2	Explain Vitamin A deficiency as Nutritional problem? What measures can be taken to control it?	CO 2	II
4	Module 2	What is Anaemia? What measures are being taken by the Indian Govt. to prevent it?	CO 2	I
5	Module 3	What is the most accepted definition of Health Education? What are the Tools and techniques used for Health Education?	CO 3	I
6	Module 3	What are the various types of approaches to communication in Health education?	CO 3	I
7	Module 4	Elaborate about any three types of Inborn errors of metabolism.	CO 4	VI
8	Module 4	What is the roles and objectives of WHO and UNICEF in maintaining community?	CO 4	I

SECTION B - ANSWER ANY 5 OUT OF 7
5 Q X 2 M = 10 M
(To compulsorily have **ONE** question from **each** module)

9	Module 1	Explain BMI- uses and limitation.	CO 1	II
10	Module 2	What is IDD?	CO 2	I
11	Module 3	Describe Audio Visual aids.	CO 3	I
12	Module 4	Explain about FAO.	CO 4	II
13	Module 1	What are Vital Statistics?	CO 1	I
14	Module 2	Describe Marasmus.	CO 2	I

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b) Components on Skill Development/Entrepreneurship Development/ Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1	Hands on training of assessing the Nutritional status of an individual
EMP	3	Teaching the tools and techniques to be used for promotion of health education

7. Pedagogy:

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Presentation , Assignments	Participative Learning
2.	Quiz	Experiential Learning
3.	Group Discussion, Seminar	Participative Learning

8. Course Assessment Plan

a)Weightage of Marks in Continuous Internal Assessments and End Semester Examination

CO	Continuous Internal Assessments CIA -50%	End Semester Examination-50%
CO1	CIA-1	Written examination
CO2	CIA-1	
CO3	CIA-2 Poster	
CO4	CIA-2 Quiz/ crossword/MCQ	

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COMMUNITY NUTRITION
PRACTICAL

Programme: B.Sc.
Course Code: U24/NUT/DSC/401/P
Course Type: DSC 4
No. of credits: 1

Max.Hours : 30
Hours per week: 3
Max.Marks: 50

Course Objectives:

1. Create awareness among students by assessing the nutritional status using Anthropometry, Biochemical tests, clinical examination and Diet survey.
2. Evaluation of students on the basis of visual aids prepared by them which will enable them to educate the community at large.

Course Outcomes :

After the successful completion of the practical course, the student will be able to

- Apply their skills to assess the health status of individuals by using ABCD methods of nutritional assessment .
- Create awareness about nutrition by educating the community using the different audio visual aids prepared by them.

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Practical Course Content:

Identifying at risk and vulnerable groups.

1. Assessment of Nutritional status —

a) Anthropometric measurements :

i) Height, weight, waist circumference, waist to hip ratio, skin fold thickness, MUAC

ii) Body Composition Analysis

b) Biochemical tests and Clinical Examination :

i) BP Monitoring, Estimation of Glucose and Haemoglobin.

ii) Observing Clinical symptoms of Nutrition deficiency.

c) Dietary Evaluation :

i) Planning Questionnaire

ii) Nutrition and Diet Survey using software

2. Methods Of Extension Used In The Community

a) Preparation of visual aids, charts, poster, 3D models

3. Planning and preparation of a low cost recipe.

4. Visit to any National Organization/ICDS.

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COMMUNITY NUTRITION
MODEL QUESTION PAPER
PRACTICAL

Course Code: U24 /NUT/DSC/401/P
No. of credits: 1

Marks : 50M
Time : 2 Hrs

Answer the following

1. Write a report on the prepared Poster	**05 M**
2. Write briefly about the following programmes	**15 M**
a. ICDS	
b. UNICEF	
c. NIN	
3. Visual Aid (Internal)	**20 M**
4. Viva	**05 M**
5. Record	**05 M**

Prepared by	Checked & Verified by	Approved by
Ananya Sarkar Ms Ananya Sarkar Signature of the teaching faculty	Ms. Tabitha Ramona Name and Signature of HoD	Dr. Uma Joseph Name and Signature of Principal

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SEMESTER- IV
INTELLECTUAL PROPERTY RIGHTS

1. Course Description

Programme: B. Sc.
Course Code: U24/CHE/SEC/401
Course Type: SEC
No. of credits: 2

Max. Hours: 30 hrs
Hours per week: 2
Max. Marks: 50

2. Course Objectives

- To create awareness on the concept of Intellectual Property Rights that has assumed a great importance in recent times because of the recognition that "knowledge is property".
- To understand the importance of international treaties and organizations involved in the protection of Intellectual property.
- To enable students to comprehend the various aspects of Patent.

3. Course Outcomes

CO 1: Recall the various types of Intellectual properties and their importance.

CO 2: Recognise the importance of international treaties and organisations in promoting and protecting intellectual property rights.

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4. Course Content

MODULE I: INTRODUCTION TO I.P.R & INTERNATIONAL TREATIES 15 Hrs

Concept of Property, Kinds of Property, General concept and Significance of Intellectual Property (IP), Introduction to Intellectual Property Rights (IPR) and their protection, Recent Developments, Introduction to Patents, Trademarks, Copyrights, Trade secrets, Industrial designs and Geographical indications. Paris Convention for the Protection of Industrial Property, Trade Related Aspects of Intellectual Property TRIPS, TRIMS, WIPO, Budapest treaty on the international recognition of the deposit of microorganisms for the purpose of patent procedure.

MODULE 2: PATENTS 15 Hrs

Introduction, The Patent's act 1970, Protectable Subject Matter- patentable invention, Procedure for Obtaining patent, Provisional And Complete Specifications, Rights conferred on a Patentee, Transfer of Patent, Revocation and surrender of Patents, Infringement of patents, Action for Infringement, Patent Agents, Patent Cooperation Treaty (PCT) Brief Discussion on Case Law on Patents.

5. References

1. Dhyani, *Fundamentals of Jurisprudence*: Allahabad Publication, Central Law.
2. Dwivedi S.P. *Jurisprudence of Legal Theory.* Allahabad Central Law Agency.
3. *Treaties on Intellectual Property Rights* Blackstone.
4. Myneni. T.O. Asia Law House.
5. Wadhera B.L., *Intellectual property rights* Universal Law Publications.
6. Narayana P, *Patent Law* Eastern Book Company.
7. Acharya, N.K.: *Textbook on intellectual property rights*, (2001) Asia Law House.
8. Guru M., Rao M.B. (2003). *Understanding Trips: Managing Knowledge in Developing Countries*, Sage Publications.
9. Ganguli P. (2001)., *Intellectual Property Rights: Unleashing the Knowledge Economy*, Tata McGraw-Hill.
10. Miller A.R., Davis M. (2000): *Intellectual Property: Patents, Trademarks and Copyright in a Nutshell,* West Group Publishers.
11. Watal J., *Intellectual property rights in the WTO and developing countries*, Oxford University Press.

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6. Syllabus Focus

a. Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Local, Regional	Allow students to own their innovations in the same way that physical property can be owned.
National, Global	Enables students to develop innovative and valuable work with a strong IP system.

b. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	All	Establish guidelines for creating intellectual property and analyse third party interactions.
ED	All	IPR can be used to protect the technology, brand name, design and creativity behind the concept.
EMP	All	Multifacet involves a variety of responsibilities like research and development, experimentation, data analysis, documentation, collaboration and innovation.

7. Course Assessment Plan

a. Weightage of Marks in Continuous Internal Assessments and End Semester Examination

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination- 60%
CO1	CIA1-Mock courts	Written Exam

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CO2	CIA1-Case Studies	

b). Question Paper Pattern

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CHEMISTRY
Model Paper
B.Sc. II - Semester IV
SKILL ENHANCEMENT COURSE
INTELLECTUAL PROPERTY RIGHTS (IPR)

Time: 1 Hr **Course Code: U24/CHE/SEC/401**
Max. Marks: 30

SECTION A - Answer any six questions **6 x 5 = 30 Marks**

Question Number	Question		CO	BTL
1	Module 1	1.Illustrate the importance of Trademarks and Geographical indications.	CO 1	(Level II)
2	Module 1	2. Explain the significance of intellectual property rights.	CO 1	(Level I)
3	Module 2	3. Outline the importance of TRIPS in promoting IPR. (CO 2) **L2**	CO 2	(Level I)
4	Module 1	4. What is the Budapest treaty on the international recognition of microorganisms?	CO 1	(Level I)
5	Module 1	5. Describe in brief the role of WTO in promoting IP.	CO 1	(Level I)
6	Module 2	6. Summarize a note on rights conferred on a patentee.	CO 2	(Level II)

7	Module 2	7. Give a description on patentable subject matter.	CO 2	(Level I)
8	Module 2	8. Explain briefly the action for infringement of patents.	CO 2	(Level I)

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(AN AUTONOMOUS COLLEGE AFFILIATED TO OSMANIA UNIVERSITY)
CHEMISTRY
Model Paper
B.Sc. II - Semester IV
SKILL ENHANCEMENT COURSE
INTELLECTUAL PROPERTY RIGHTS (IPR)

Time: 1 Hr **Course Code: U24/CHE/SEC/401**
Max. Marks: 30

SECTION A - Answer any six questions **6 x 5 = 30 Marks**

1.Illustrate the importance of Trademarks and Geographical indications. (CO 1)**L2**
2. Explain the significance of intellectual property rights. (CO 1)**L1**
3. Outline the importance of TRIPS in promoting IPR. (CO 2)**L2**
4. What is the Budapest treaty on the international recognition of microorganisms? (CO 1)**L1**
5. Describe in brief the role of WTO in promoting IP. (CO 1)**L1**
6. Summarize a note on rights conferred on a patentee. (CO 2)**L2**
7. Give a description on patentable subject matter. (CO 2) **L1**
8. Explain briefly the action for infringement of patents. (CO 2)**L1**

Prepared by	Checked & verified by	Approved by
Name and Signature of the teaching faculty Dr. Shikha Chander Ms. Deepthi	Name and Signature of the HoD Dr. D. Sumalatha	Name and Signature of the Principal Dr. Uma Joseph

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SEMESTER IV

Skill Enhancement Course II

NURSERY MANAGEMENT

1. Course Description

Programme:	**B. Sc**	**Max. Hours:**	**30**
Course Code:	**U24/BOT/SEC/401/P**	**Hours per week:**	**2**
Type of Course:	**SEC - 401**	**Max. Marks:**	**30**
No. of Credits:	**2**		

2. Course Objectives

1. Describe the methods of growing plants in a safe and sustainable way, and how to run their own successful gardens.
2. Interpret various methods of plant propagation and maintenance.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO 1: Describe the process of nursery bed preparation for growing plants along with various vegetative propagation methods.

CO 2: Describe the methods for skill acquisition in garden creation and horticultural practices

4. Course content

1. Preparation of nursery bed and polybag filling
2. Preparation of potting mixture – Potting and repotting.
3. Vegetative propagation methods – Cutting, grafting, budding and layering
4. Identification and use of garden tools and implements.
5. Laying out drip irrigation & sprinklers.
6. Establishment and management of vegetable garden.
7. Identification of common plant pests and diseases.

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5. Reference Books

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs (Mention any ONE at a time)	**Relevance** (Describe how the course addresses the need) Maximum 15 words
Local developmental needs	Integrating nursery and gardening practices into local development can create sustainable environment that address socio-economic and health challenges.

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b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
ED	Practical paper	• Run a profitable nursery business • Laying out irrigation set up for the nursery

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Participative Learning	• Presentations and Group discussions • Quiz and Just a Minute (JAM)
2.	Problem solving	• Minor projects • Reviewing research articles on syllabus topics

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

CO	Continuous Internal Assessments CIA - 20%	End Semester Examination- 30%
CO1	CIA 2 – Test 1: MCQ's, Quiz test, Practical project	Written Exam
CO2	CIA 2 – Test 2: MCQ's / Presentation / Seminar topics	

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b) Model Question Paper – End Semester Exam Practical

NURSERY MANAGEMENT

Course Code: U24/ BOT/ SEC/401/P **Max. Marks: 30**
Time: 1 Hour

Q I. Demonstrate the type of Grafting Technique with the given plant.	8 Marks
Q II. Demonstrate the Propagation Technique.	5 Marks
Q III. Identify the Spots A & B	5 Marks
Q IV. Project + Viva	7 + 3 - 10 Marks
Q V. Record	2 Marks

Prepared by	Checked &verified by	Approved by
Basanti. ch **Dr. Basanti Chintapalli** **Teaching faculty**	Basanti. ch **Dr. Basanti Chintapalli** **HoD**	**Dr. Uma Joseph** **Principal**

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SEMESTER IV

PLANT ANATOMY & EMBRYOLOGY

1. Course Description

Program:	**B. Sc**	**Max. Hours:**	**60**
Course Code:	**U24/ BOT/ DSC/401**	**Hours per week:**	**4**
Type of Course:	**DSC-4**	**Max. Marks:**	**60**
No. of Credits:	**4**		

2. Course Objectives

1. To explain anatomical structure and functions of various tissues.
2. To describe Pollen formation and morphology to shape, Megaspore formation, pollen pistil interaction and relationship between embryo and endosperm.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO1: Describe the tissue systems, structure of stomata and recognize the anatomy and ontogeny of leaves

CO2: Compare the normal and anomalous secondary growth in plants in addition to examining the properties and economic importance of wood.

CO3: Explain the scope of Embryology alongside the structure of anther and ovule; discuss microsporogenesis, megasporogenesis, pollination types and pollen – pistil interaction.

CO4: Describe the structure and functions of embryo, endosperm and seed.

4. Course content

Module I: Meristematic and permanent tissues **15 Hours**

1.1 Meristems: Types, histological organization of shoot and root apices and theories. Simple Tissues.

1.2 Complex (Xylem and Phloem) and Secretory tissues (Hydathodes, Laticiferous, Salt glands and Nectaries

1.3 Leaf: Ontogeny, diversity of internal structure; stomata and epidermal outgrowths.

Module II: Secondary growth **15 Hours**

2.1. Secondary growth in Dicot stem and root, Vascular cambium – Formation and function.

2.2. Anomalous secondary growth – A*chyranthes, Boerhaavia, Bignonia* & *Dracaena*

2.3. Wood structure: General account. Study of local timbers – Teak (*Tectona grandis*), Rosewood (*Dalbergia latifolia*), Red sanders (*Pterocarpus santalinus*), Nallamaddi (*Terminalia tomentosa)*, Neem (*Azadiracta indica*).

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Module III: Structural organization of Flower **15 Hours**

3.1 Structure of anther and pollen; microsporogenesis and development of male gametophyte.
3.2 Structure and types of ovules; megasporogenesis; types and development of female gametophyte.
3.3 Types of embryo sacs, Pollination types & Pollen – Pistil interaction; Double fertilization.

Module IV: Embryo & Endosperm **15 Hours**

4.1 Endosperm: Types, structure and functions; Dicot and monocot embryo; Embryo-endosperm relationship.
4.2 Seed-structure (Dicot and Monocot), Appendages and dispersal mechanisms.
4.2 Apomixis and Polyembryony

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5. Reference Books

1. Esau, K. 1971. *Anatomy of Seed Plants*. John Wiley and Son, USA.
2. Bhojwani, S. S. and S. P. Bhatnagar. 2000. *The Embryology of Angiosperms (4th Ed.),* Vikas Publishing House, Delhi.
3. Singh, V., Pande, P.C and Jain, K.2004. *Embryology of Angiosperms (1st Ed.),* Rastogi Publications, Meerut.
4. Maheswari, P. 1971. *An Introduction to Embryology of Angiosperms*. McGraw Hill Book Co., London.
5. Fahn.1997. *Plant Anatomy*. Aditya Book (P) Ltd. New Delhi.
6. P.C. Vasishta. 1991.*Plant Anatomy*. Pradeep Publications, Jalandhar, New Delhi.
7. M.S. Tayal. 1990. *Plant Anatomy*. Rastogi Publications, New Delhi.
8. H.N. Srivastava. 1993. *Introductory Botany, Volume II*. Pradeep Publications, New Delhi.
9. Esau, K.1971.Anatomy *of Seed Plants*. John Wiley and Son, USA.
10. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
11. Eames.A.J and Laurence H. Mac Daniels. (1953). An introduction to plant anatomy. New York ;London : McGraw-Hill, 1925.

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6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs (Mention any ONE at a time)	**Relevance** (Describe how the course addresses the need) Maximum 15 words
Regional needs	Research in plant anatomy provides sustainable agricultural practices to mitigate environmental degradation. Insights into embryonic development aid in breeding programs.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP (Mention any ONE of the above at a time)	**Syllabus Content** (Mention Module No. or part content applicable)	**Description of Activity** (Activity that will be conducted in class to support the focus of SD/ED/EMP in the syllabus content)
SD	Module II: Secondary growth	Understanding the anatomical structures of root, leaf and stem through hand sectioning of samples and observing under microscope

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7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Participative Learning	• Presentations and Group discussions • Reading and gathering information from library
2.	Experiential Learning	• Preparing models • Testing viability of pollen grains from different flowers specific examples
3.	Problem solving	• Research Projects • Reviewing research articles

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination- 60%
CO1	CIA 2 – Test 1: MCQ's, Quiz test or subjective	Written Exam
CO2	CIA 1 - Subjective	
CO3		
CO4	CIA 2 – Test 2: MCQ's / Presentation / Seminar topics	

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b) Model Question Paper – End Semester Exam Theory

PLANT ANATOMY & EMBRYOLOGY

Course Code: U24/ BOT/ DSC/401 **MAX MARKS: 60**

Credits: 4 **TIME: 2 hours**

Note: This question paper consists of Section A and B. The answer to Section A and B must be written in the answer book given.

Section A (Long Essay Type)

I. Answer all Questions **Marks: 4 x 10 – 40**

1. Explain different types of meristematic tissues.
   OR
2. Describe in detail about stomata.

3. What is anomalous secondary growth? Describe secondary growth in *Boerhaavi*a stem.
   OR
4. Describe in detail about a. Teakwood b. Red sanders.

5. Illustrate in detail about the nuclear behavior in tapetal cells.
   OR
6. Describe the Bisporic Embryosac.

7. Describe in detail structure and functions of endosperm.
   OR
8. What are the different seed dispersal mechanisms?

Section B (Short Essay Type)

II. Write short notes on any **FOUR** of the following: **Marks: 4 x 5 - 20**

9. What is Xylem? List out its components and function
10. What is vascular cambium? Mention its functions.
11. Explain the anther structure.
12. Describe the structure of dicot embryo
13. List types of ovules
14. Describe Apomixis

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SECTION A - INTERNAL CHOICE				4Q X 10 M = 40 M
Question Number	Question	Question	CO	BTL (Blooms Taxonomy Level)
1	Module 1	Explain different types of meristematic tissues.	CO 1	Level I
2	Module 1	Describe in detail about stomata.	CO 1	Level II
3	Module 2	What is anomalous secondary growth? Describe secondary growth in *Boerhaavia* stem.	CO 2	Level I, II
4	Module 2	Describe in detail about a. Teakwood b. Red sanders	CO 2	Level I, II
5	Module 3	Illustrate in detail about the nuclear behavior in tapetal cells.	CO 3	Level II
6	Module 3	Describe the Bisporic Embryosac.	CO 3	Level I, II
7	Module 4	Describe in detail structure and functions of endosperm.	CO 4	Level I, II
8	Module 4	What are the different seed dispersal mechanisms?	CO 4	Level I
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have ONE question from each module)				4Q X 5 M = 20 M
9	Module 1	What is Xylem? List out its components and function	CO 1	Level I
10	Module 2	What is vascular cambium? Mention its functions.	CO 2	Level I
11	Module 3	Explain the anther structure.	CO 3	Level II
12	Module 4	Describe the structure of dicot embryo	CO 4	Level I, II
13	Module 3	List types of ovules	CO 3	Level I, IV
14	Module 4	Describe Apomixis	CO 4	Level I, II

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c) Question Paper Blueprint

Modules	Hours Allotted in the Syllabus	COs Addressed	Section A (No. of Questions)	Total Marks	Section B (No. of Questions)	Total Marks
1	15	CO 1	2	10 each	1	5
2	15	CO 2	2	10	1	5
3	15	CO 3	2	10	1	5
4	15	CO 4	2	10	1	5

9. CO-PO Mapping

CO	PO	Cognitive Level	Classroom sessions (hrs)
1	1, 5	Understand	15
2	1, 2, 3, 5, 7, 8	Analyzing	15
3	1, 5	Understand	15
4	1, 5	Understand	15

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PLANT ANATOMY & EMBRYOLOGY

Practical Syllabus

1. Course Description

Programme:	**B. Sc**	**Max. Hours:**	**30**
Course Code:	**U24/ BOT/ DSC/401/P**	**Hours per week:**	**2**
Type of Course:	**DSC - 4**	**Max. Marks:**	**50**
No. of Credits:	**1**		

2. Course Objectives

1. To develop skills in taking anatomical sections of stem & root along with observing the distribution of various tissues.
2. To analyze knowledge on pollen morphology, viability, microsporogenesis, embryo types through slides and specimens.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO 1: Identify the Individual Cells and Tissues by observing permanent slides and by taking anatomical sections

CO 2: Describe the concepts of palynology and embryology.

4. Course Content

1. Apical meristem of root, shoot and vascular cambium. Distribution and types of parenchyma, collenchyma and sclerenchyma.
2. Epidermal system: cell types, stomatal types.
3. Preparation of double stained Permanent slides: Primary structure: Root - *Cicer, Canna*; Stem – *Tridax, Sorghum*; Secondary structure: Root – *Tridax* sp.; Stem – *Pongamia*; Anomalous Secondary Structure: *Boerhaavia, Bignonia, Dracaena.*
4. Structure of anther and microsporogenesis using permanent slides.
5. Structure of pollen grains using whole mounts (*Catheranthus, Hibiscus, Acacia*, and Ocimum).
6. Pollen Viability test using in - vitro germination- *Hibiscus.*
7. Study of ovule types; Development stages of monocot and dicot embryos using permanent slides.

4. Model Question Paper – End Semester Exam Practical

PLANT ANATOMY & EMBRYOLOGY

Course Code: U24/ BOT/ DSC/401/P

Time: 2 Hours **Maximum Marks: 50 Marks**

Q I. Prepare a double stained permanent mount of transverse section of the given material 'A', with a well labelled diagram. Give description and identify. Mention stains used and leave the slide for valuation by the examiner.

(Slide preparation –2; description – 3; stains used –1; identification –1; Diagram –3) **10 marks**

Q II. Prepare a temporary mount of the pollen from the pre-processed given material **'B'**. Identify, draw and describe.

(Identification – 1; slide preparation – 1; characters – 2; diagram – 1) **5 marks**

Q III. Identify and describe the stomatal type **'C'**.

(Identification – 1; description & diagram – 4) **5 marks**

Q IV. Critical notes on THREE spotters. **D, E, F.** **5 x 3 – 15 marks**

Q V. Project. (Conduct field work for a period of not less than 5 days under the guidance of a teacher and submit field report) **10 Marks**

Q VI. Record **5 Marks**

Prepared by	Checked &verified by	Approved by
S. Revathi **Dr. S. Revathi** **Teaching faculty**	Basanti. ch **Dr. Basanti Chintapalli** **HoD**	**Dr. Uma Joseph** **Principal**

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ST.FRANCIS DEGREE COLLEGE FOR WOMEN BEGUMPET
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(AN AUTONOMOUS COLLEGE OF OSMANIA UNIVERSITY)
DEPARTMENT OF NUTRITION

SEC-2	QUANTITY FOOD PRODUCTION SEMESTER- IV	30 HRS
Module 1 - Quantity Food Production and Food Management **Module 2 - Standardization of Recipes**		

- The syllabus contains four Modules. Paper should give equal weightage to all Modules. Four long questions- One question per module with internal choice

SEMESTER - IV

QUANTITY FOOD PRODUCTION

1. Course Description

Programme: B.Sc
Course Code: U24/NUT/SEC/401
Course Type: SEC -2
No. of credits: 2

Max. Hours: 30
Hours per week: 2
Max. Marks: 50

2. Course Objectives

- To gain knowledge on different types of food service layouts.
- To plan and prepare different types of menus for food production.

3. Course Outcomes

After the successful completion of the SEC course, the student will be able to

- Acquire knowledge of the different types of food service styles and to apply the skills in menu planning for the food service Modules.
- Acquire skill in cost concepts in the food industries.

4. Course Content

MODULE I: QUANTITY FOOD PRODUCTION AND FOOD MANAGEMENT (15 Hrs)

1.1 Principles of food production-menu, ingredient control etc. Production control -use of standardized recipes.
1.2 Safeguarding food Production-Quality control in food preparation, control of the microbial quality of food.
1.3 Purchasing - market and the buyer, mode of purchasing, methods of purchase.Storage. Cooking Equipment. Records necessary for catering.

MODULE II: STANDARDIZATION OF RECIPES (15 Hrs)

1. Standardization of rice items
2. Standardization of dals and sambar
3. Standardization of vegetable fry
4. Standardization of Vegetable curries
5. Standardization of deep fried foods
6. Standardization of commercially available products

5. References

1. Catering Management - An Integrated Approach — Mohini Sethi, Surjeet Malhan, 3rd edition, New Age International Publishers.
2. Institutional Food Management - Mohini Sethi. New Age International Publishers.
3. Foodservice management, principles and practices, 13" edition- June Pyne Palacio, Monica thiece. Pearson publishers

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Local	Planning standardized recipes for the food service unit.

b) Components on Skill Development/Entrepreneurship Development/ Employability

SD/ED/EMP	Syllabus Content	Description of Activity
ED	I	Preparation of Standardized recipes in the food service unit.

7. Course Assessment Plan

a)Weightage of Marks in Continuous Internal Assessments and End Semester Examination

Formative Assessment - FA (40)	Summative Assessment - SA (60)
CIA-20 marks Fill in the blanks/ MCQ/ Crossword	End Semester exam-30 Marks

b) Model Question Paper- End Semester Exam

QUANTITY FOOD PRODUCTION
MODEL QUESTION PAPER
THEORY

Course Code: U24/NUT/SEC/401 **Max Marks: 30**

Credits: 3 **Time: 1 Hrs**

I. Answer any five of the following **5x6 = 30M**

1. Ingredient control
2. Production control
3. Process of standardization
4. Quality control in food preparation
5. Modes of purchasing
6. Records necessary in catering
7. Storage of cooking equipments
8. Microbial identification in food

Prepared by	Checked & Verified by	Approved by
Ms Indu Bhargavi Signature of the teaching faculty	Ms. Tabitha Ramona Name and Signature of HoD	Dr. Uma Joseph Name and Signature of Principal

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FACULTY OF SCIENCE- DEPARTMENT OF CHEMISTRY
PRACTICAL SYLLABUS CBCS-2024
SEMESTER -IV
SYNTHESIS OF ORGANIC COMPOUNDS AND FUNCTIONAL GROUP ANALYSIS

Program: B.Sc.
Course Code: U24/CHE/DSC/401/P
Course: DSC-4
No. of Credits: 1

Max. Hours: 20 Hrs
Max. Marks: 50
Hours per week: 2

Course Objective

- To prepare simple organic compounds and systematically analyse functional groups based on their nature and chemical reactivity.

Course Outcomes

CO1: Utilise the knowledge of organic reaction mechanisms in their preparations.
CO2: Categorise functional groups present in organic compounds using systematic quantitative analysis.

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono functional groups (-COOH, phenolic, aldehydic, ketonic, carbohydrate, amide, nitro, amines) and preparation of one derivative.

Synthesis of organic compounds:

a. Acetylation – Preparation of Acetanilide.
b. Halogenation – Preparation of p-Bromo acetanilide.
c. Oxidation – Preparation of Benzoic acid.
d. Esterification - Preparation of n-butyl acetate.
e. Methylation – Preparation β-Naphthyl methyl ether.
f. Nitration – Preparation of Nitrobenzene
g. Reduction – Preparation of m-Nitroaniline

Reference Books:

- Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., *Textbook of Practical Organic Chemistry*, Prentice-Hall, 5th edition, 1996.
- Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry* Orient-Longman, 1960.
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry,* Universities Press.

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6. Syllabus Focus

a. Relevance to Local, Regional, National and Global Development Needs

Local /Regional/ National /Global Development Needs	Relevance
Local	Knowledge of the basic principles of Chemistry to help in day-to-day life.
Regional	Learn about the concepts and significance of carbohydrates and bioinorganic chemistry.
National	Understand the basics of organometallic compounds, non-aqueous solvents and dipole moments.
Global	Application of basic principles of rotational, IR, UV-Vis Spectroscopy techniques, concepts of chemical kinetics, heterocyclic compounds and pericyclic reactions.

b. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	Practical syllabus which includes Organic preparations and Qualitative analysis in Organic Chemistry Problem solving in Physical Chemistry	Students perform the experiments based on the procedure and also analyse the unknown compounds. Students solve the problems
ED	Organic preparations and analysis. Structural investigation of organic compounds based on spectroscopy	Students prepare organic compounds, analyse the functional groups and carry out the structural analysis based on spectral data
EMP	Inorganic, Organic, Physical Chemistry and Spectroscopy	Tutorials and assignments

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7. Pedagogy

S. No.	Student Centric Methods Adopted	Type / Description of Activity
1	Experiential	Experiments, attending seminars/workshops and field visits
2	Participative	Group discussion, quiz, presentations etc.
3	Problem solving	Solving problems in Physical Chemistry and structural elucidation based on spectral data.

8. Course Assessment Plan

a. Weightage of Marks in Continuous Internal Assessments & End Semester Examination

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination-60%
CO1	CIA1-Written Exam	Written Exam
CO2	CIA 2- Skill based test like poster/powerpoint presentation, collage, 3D model making, problem solving and quiz.	
CO3	CIA1-Written Exam	
CO4	CIA 2- Skill based test like poster/powerpoint presentation, collage, 3D model making, problem solving and quiz.	

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b. Model Question Paper - End Semester Exam

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Faculty of Science – Department of Chemistry

MODEL PAPER

B.Sc. II YEAR SEMESTER -IV

CHEMISTRY - PAPER IV

TIME: 2 hrs **Course Code: U24/CHE/DSC/401**

Max. Marks: 60

SECTION –A (Essay Questions)

.Answer the following

4X10=40 Marks

1. a) Explain the classification of organometallic compounds based on metal-carbon bonds. (CO1) **L1** 5M
   b) Discuss the reactions in liquid ammonia with suitable examples. (CO1) **L2** 5M

OR

2. a) Describe the preparation, properties and applications of Grignard reagent. (CO1) **L3** 6M
   b) How does fixation of carbon dioxide occur in photosynthesis? (CO1) **L2** 4M
3. a) Derive an expression for the rate constant of first order reaction. (CO2) **L3** 5M
   b) A first order reaction is 50% complete in 100 minutes. How long will it take for 90% completion? (CO2) **L5** 5M

OR

4. Explain different methods of experimental determination of order oa a reaction. (CO2) **L2** 10M
5. a) Discuss the open chain structure of Glucose. (CO3) **L2** 5M
   b) Write the equations involved in Killiani-Fischer synthesis. (CO3) **L2** 5M

OR

6. a) Explain the synthesis of Furan, Pyrrole and Thiophene from 1,4-dicarbonyl compounds. (CO3) **L2** 5M
   b) What are pericyclic reactions? Give their classification with an example each. (CO3) **L4** 5M
7. a) What is a dipole moment? Predict the structure of CO_2 and SO_2 based on dipole moment. (CO4) **L4** 5M
   b) Explain the various molecular vibrations seen in IR spectroscopy. (CO4) **L2** 5M

OR

8. a) Describe in detail about the electronic transitions observed in UV-VIS spectroscopy. (CO4) **L2** 5M
   b) Explain the basic principles of Raman spectroscopy. (CO4) **L2** 5M

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SECTION –B

II. Answer any four. **4x5=20 Marks**

9. Write a note on the biological significance of calcium and chloride ions. (CO1) **L1**
10. Give two methods of preparation of ferrocene. (CO1) **L1**
11. Discuss briefly about collision theory. (CO2) **L2**
12. Explain the factors affecting the rate of a reaction. (CO2) **L2**
13. Explain mutarotation taking glucose as an example. (CO3) **L2**
14. Explain the concept of chromophore and auxochrome. (CO4) **L2**

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