248	B.Com (E-Commerce)	Modern Banking	20UEC4A4	2020
249	B.Com (E-Commerce)	Investment Management	20UEC620	2020
250	B.COM(FINANCE)	Allied –I Business Economics	20UCF1A1	2020
251	B.COM(FINANCE)	CoreVII:Banking Law and Practice	20UCF307	2020
252	B.COM(FINANCE)	Core XIV - Principles of Insurance	20UCF514	2020
253	B.Com PA	Core XVI : Financial Services	20UPA516	2020
254	B.Com (BPS)	Supply Chain Management for Business Process Services	20UBP308	2020
255	B.COM IB	Sourcing & Procurement for International Business	20UIB6E5	2020
256	M.A Tamil	Ikkala illakiyam	20PTM101	2020
257	M.A Tamil	Bhakthi ilakkamum sitrilakkiamum	20PTM205	2020
258	M.A Tamil	Kaappiangal	20PTM205	2020
259	M.A Tamil	Thonmaiilakkiam	20PTM414	2020
260	M.Sc. Botany	Enterpreneurship Botany	20PBY2N1	2020
261	M.Sc. Botany	Plant ecology, tissue culture and Phytochemical techniques	20PBY315	2020
262	M.Sc Computer Science	Advanced Database Management System	20PCS103	2020
263	M.Sc Computer Science	Advanced Java Programming	20PCS207	2020
264	M.Sc Computer Science	Cloud and Big Data Analytics	20PCS209	2020
265	M.Sc Computer Science	Programming Lab -III : Advanced Java Programming	20PCS210	2020
266	M.Sc Computer Science	R Lab	20PCS314	2020
267	M.Sc Computer Science	Network Security and Cryptography	20PCS314	2020
268	M.Sc. Physics	Non Conventional Energy Sources	20PPS2N1	2020
269	M.Sc. Chemistry	Organic Chemistry I: Reactions and Mechanism	20PCY102	2020
270	M.Sc. Chemistry	Inorganic Chemistry III-Bioinorganic and Inner Transition Elements	20PCY412	2020
271	M.Sc. Chemistry	Phytochemical Techniques and health chemistry	20PCY414	2020
272	M.Com (CA)	Higher Corporate Accounting	20PCC101	2020
273	M.Com (CA)	Basics of Income Tax	20PCC2N1	2020

BOS Highlighted

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NALLAMUTHU GOUNDER MAHALINGAM COLLEGE POLLACHI

Dr. R. MUTHUKUMARAN,
M.A.,M.Phil.,B.Ed.,Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

BOARD OF STUDIES IN M.Sc CHEMISTRY - 22.02.2020

SL. NO	MEMBERS	SIGNATURE
1.	Dr. K. POONKODI (CHAIR PERSON) Assistant Professor & Head, Post Graduate Department of Chemistry NGM College, Pollachi.	Chairman Board of Studies in Chemistry (PG) Nallamuthu Gounder Mahalingam College (Autonomous) POLLACHI-642001
2.	Dr. S. PONNUSAMY (UNIVERSITY NOMINEE) ASSOCIATE PROFESSOR, Department of Chemistry Govt Arts College, Coimbatore – 641018.	ABSENT University Nominee Board of Studies in Chemistry (PG) Nallamuthu Gounder Mahalingam College (Autonomous) POLLACHI-642001
3.	Dr. K.P. Elango [ACADEMIC AUDITOR] Professor, Department of Chemistry Gandhigram Rural Institute (Deemed to be University), Dindugul.	22/2/20 Academic Auditor Board of Studies in Chemistry (PG) Nallamuthu Gounder Mahalingam College (Autonomous) POLLACHI-642001
4.	Dr. S. Ravi [SUBJECT EXPERT] Professor & Head, Department of Chemistry Karpagam Academy of Higher Education Coimbatore.	22/2/2020 Subject Expert Board of Studies in Chemistry (PG) Nallamuthu Gounder Mahalingam College (Autonomous) POLLACHI-642001
5.	Mr. S. Elamaran [Industrial Expert] Branch Manager - QC Clean Car Industries, 20/2A-2B Amar Jothi Nagar, SIHS Colony, Coimbatore.	22/2/20.
6.	Dr. V. PRABHU Assistant Professor, PG Department of Chemistry NGM College, Pollachi.	22/2/20
7.	Ms. K. VIMALADEVI Assistant Professor, PG Department of Chemistry NGM College, Pollachi.	22/2/2020
8.	Mrs. R. MINI Assistant Professor, PG Department of Chemistry NGM College, Pollachi	22/2/2020
9.	Ms. M. ANUSUYA Assistant Professor, PG Department of Chemistry NGM College, Pollachi	22/2/2020

MINUTES

The members of board of Studies met on 22/2/2020. The Syllabi on theory, Practical and Project were thoroughly discussed. The previous suggestion in the syllabi was incorporated and the corrections were resolved.

THE FOLLOWING POINTS ARE CHAINGIED IN THE BOARD OF STUDIES;

1. Course Outcomes are changed according to the syllabus revision.
2. Included five Course Outcomes, Programme Outcomes and Programme Specific Outcomes.
3. Programme Specific Outcome designed to enrich students for the higher learning, employability and entrepreneurship.
4. Subject expert and academic Auditor suggest the following changes,
   - The components of internals are changed to weitage.
   - The Test-I and Test-II will mandatory (without writing Tests the students can easily score required minimum 12 marks by scoring other components)
   - The compulsory question (Question Number-16) in Section-C can be designed as a separate Section (Section D)
   - Section-C may be choice based.
   - Programme outcome should be included and mapping will be with CO and POs (Science Stream)
   - For value added courses the grade may be given, not completed or incompleted.
   - In practicals the credit and contact hours are included in every semester.
   - Inorganic Chemistry - II as main subject not as elective.
   - In project, examination hours may be removed.
   - In references, one foreign author must be included in text books, the titles (books for study and books for reference) changed to text books and reference books.
   - In organic chemistry Practical - I, for minizing hazardous chemicals, bulk separation is removed and removed and only pilot test is enough.
   - Subject-wise panel of examiners may be included.
   - project hours included in the syllabus.
   - In Spectroscopic Techniques - changed as Applications in organic Chemistry.
   -

5. New course introduced for Advanced learners as,
   - Phytochemical Techniques and Health Chemistry
6. Self Study portion included in each unit in entire syllabus for SET/NET requirements to motivate advanced learners.
7. Revise 30% of entire syllabus.
8. The Scheme, COs, methodology and evaluation are changed for final semester project.
9. 80% of the syllabus is correlated with CSIR-NET syllabus.

CHANGES MADE DURING SYLLABUS REVISION.

- References and text books of latest editions are added.
- Video links and open source links are added.
- The Continuous Internal Assessment (CIA) components for the academic year are modified as,

1. Test -I (50% of Syllabus)	= 70 marks
2. Test - II (remaining 50% of syllabus)	= 70 marks
3. Assignment	= 20 marks
4. Seminar/Tutorial	= 20 marks
5. Knowledge Enhancement	= 20 marks
6. Information Acquisition	= 10 marks
Total	= 210 marks
210/7	= 30 marks [as Internal]

- Changes in SEMESTER - I

* In organic Chemistry - I (Reactions and mechanism) all units are revised, Tautomerism and many naming reactions are also included.
* In Physical Chemistry - I (Group theory and Chemical kinetics) Unit - V; kinetics of polymerization is replaced by fundamentals of photochemistry.

Changes in SEMESTER - II

* In Inorganic Chemistry - II (coordination and Organometallic chemistry) of unit - I; Magnetic properties of first row transition metal complexes is included. Kinetics of octahedral substitution is removed from the unit.

Changes in SEMESTER - III

* In Major Elective - I (Spectroscopy) some contents are rearranged for continuity with minor revision.
* In Major Elective - II (Green, Nano Chemistry and Cyber Security), E-Journals, Plagiarism, IPR, Trade and copyrights are added.

Changes in SEMESTER - IV

* Major Elective - III (Medicinal Chemistry) Self study portions are modified.

22/2/2020
Chairman
Board of Studies in Chemistry (PG)
Nallamuthu Gounder Mahalingam College (Autonomous)
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22/2/20
Academic Auditor
Board of Studies in Chemistry (PG)
Nallamuthu Gounder Mahalingam College (Autonomous)
POLLACHI-642001

22/2/2020
Subject Expert
Board of Studies in Chemistry (PG)
Nallamuthu Gounder Mahalingam College (Autonomous)
POLLACHI-642001

22/2/20 [Mr. S. Elamaran, Industrial Expert]

22/2/20 [Dr. V. Prabhu, Assistant Professor]

22/2/2020 [Ms. K. Vimaladevi, Assistant Professor]

22/2/2020 [Ms. R. Mini, Assistant Professor]

22/2/2020 [Ms. M. Anusuya, Assistant Professor]

PG DEPARTMENT OF CHEMISTRY

SYLLABUS

2020-2022 Batch

Dr. K. POONKODI, M.Sc., M.Phil., Ph.D.

Mrs. K. VIMALADEVI, M.Sc., M.Phil., (Ph.D)

Ms. R. MINI, M.Sc., M.Phil., (Ph.D)

Dr. V. PRABHU, M.Sc., Ph.D.

Mrs. M. ANUSUYA, M.Sc., M.Phil., (Ph.D)

NGM COLLEGE (Autonomous)

Affiliated to Bharathiar University

Re-Accredited by NAAC & ISO 9001:2015 certified

90, Palghat road, Pollachi- 642001, Coimbatore (Dist)

Phone: 04259-234868. 234870 Fax: 04259-234869

Website: www.ngmc.org

SCHEME OF SYLLABUS & EXAMINATION

I- SEMESTER

SEM	Course Code	Title of the Paper	Duration in hours per week	Examination				Credits
				Hours	CIA	ESE	Total	
I	20PCY101	Inorganic Chemistry – I- Solid state and Nuclear Chemistry	5	3	25	75	100	5
I	20PCY102	Organic Chemistry – I- Reactions and Mechanisms	5	3	25	75	100	5
I	20PCY103	Physical Chemistry –I- Group Theory and Chemical Kinetics	5	3	25	75	100	5
I	20PCY207	Inorganic Chemistry Practical-I	5	--	--	--	--	--
I	20PCY208	Organic Chemistry Practical-I	5	--	--	--	--	--
I	20PCY209	Physical Chemistry Practical -I	5	--	--	--	--	--
		TOTAL MARKS					300	15

II-SEMESTER

SEM	Course Code	Title of the Paper	Duration in hours per week	Examination				Credits
				Hours	CIA	ESE	Total	
II	20PCY204	Inorganic Chemistry –II- Coordination and Organometallic Chemistry	5	3	25	75	100	5
II	20PCY205	Organic Chemistry-II – Organic Reactions and Stereochemistry	5	3	25	75	100	5
II	20PCY206	Physical Chemistry-II – Quantum and Electrochemistry	5	3	25	75	100	5
II	20PCY2N1/ 20PCY2N2	*Non-Major Elective: Chemistry in day today life/ Chemistry in context	1	3	--	100	100	2
II	20PCY207	Inorganic Chemistry Practical - I	5	6	40	60	100	3
II	20PCY208	Organic Chemistry Practical-I	5	6	40	60	100	3
II	20PCY209	Physical Chemistry Practical -I	4	6	40	60	100	4
		* Students can choose any one of the papers as electives						
		TOTAL MARKS					700	27

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Pollachi - 642 001, Coimbatore Dt.

III-SEMESTER

SEM	Course Code	Title of the Paper	Duration in hours per week	Examination				Credits
				Hours	CIA	ESE	Total	
III	20PCY310	Organic Chemistry – III – Natural Products and Organic Reagents	5	3	25	75	100	5
III	20PCY3E1 / 3E2/3E3	* Major Elective-I Spectroscopy/ Applied Electro Chemistry/ Polymer Chemistry	5	3	25	75	100	5
III	20PCY311	Physical Chemistry –III – Thermodynamics and Catalysis	5	3	25	75	100	5
III	20PCY3E4 / 3E5/3E6	* Major Elective –II Green, Nano chemistry and Cyber Security/ Water Pollution and Industrial Effluents treatment / Nano Technology and Supra Molecular Chemistry	3	3	25	75	100	3
III	20PCY414	Inorganic Chemistry Practical -II	4	6	--	--	--	--
III	20PCY415	Organic Chemistry Practical -II	4	6	--	--	--	--
III	20PCY416	Physical Chemistry Practical -II	4	6	--	--	--	--
	* Students can choose any one of the papers as electives						400	18

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IV-SEMESTER

SEM	Course Code	Title of the Paper	Duration in hours per week	Examination				Credits
				Hours	CIA	ESE	Total	
IV	20PCY412	Inorganic Chemistry –III- Bioinorganic and Inner Transition Elements	5	3	25	75	100	5
IV	20PCY4E7/ 4E8/ 4E9	*** Major Elective-III** Medicinal Chemistry/ Food Science and Technology/ Dye Chemistry	4	3	25	75	100	3
IV	20PCY413	Physical methods in chemistry	5	3	25	75	100	5
IV	20PCY414	Phytochemical techniques and health chemistry	Self - study	--	--	100	100	1
IV	20PCY415	Inorganic Chemistry Practical -II	5	6	40	60	100	3
IV	20PCY416	Organic Chemistry Practical -II	4	6	40	60	100	3
IV	20PCY417	Physical Chemistry Practical -II	4	6	40	60	100	4
IV	20PCY418	Project Work & viva voce	3	6	20	80	100	6
	*** Students can choose any one of the papers as electives**						800	30
		TOTAL MARKS					**2200**	**90**

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NALLAMUTHU GOUNDER MAHALINGAM COLLEGE
POLLACHI

Programme code:	M.Sc.	**Programme Title :**	Master of Chemistry	
Course Code:	**20PCY102**	**Organic Chemistry –I – Reactions and Mechanisms**	**Batch :**	2020-2022
			Semester	I
Hrs/Week:	5	**Total Hrs: 65**	**Credits:**	5

Course Objective

- To understand aromaticity and reaction mechanism.
- To provide knowledge about electrophilic, Elimination reactions and nucleophilic substitution reactions.
- To learn about the basic ideas about organic reaction intermediates.

Course Outcomes (CO)

K1	CO1	Remember the aromaticity of compounds and Develop skills for identifying the kinetics of reactions.
K2	CO2	Understand the mechanism of different types of substitution, addition and elimination reactions for synthesizing organic compounds.
K3	CO3	Apply the mechanisms in solving chemical reactions.
K4	CO4	Inspect the different types of reactions involved in chemical synthesis.
K5	CO5	Evaluate the various types of reaction intermediate.

Unit-1

Aromaticity **13Hrs**

Aromatic character – Huckel's Molecular orbital theory for aromaticity (HMO), concept of aromaticity and anti aromaticity – Critereia for aromaticity, Non-benzenoid aromatic compounds- Monocyclic and bicyclic non-benzenoid neutral compounds (Annulenes and azulenes).Antiaromatic and Homoaromatic compounds- Alternant and non-alternant hydrocarbons**.**

Kinetic and Non-kinetic Methods of Determination of Reaction Mechanisms

Reaction Mechanism: Kinetic methods- Mechanistic implications of rate law- Isotope effects. Kinetic and thermodynamic control of reactions - Hammonds postulates, linear free energy relationship- Hammett and Taft equations. Types of reactions and mechanisms, Non kinetic methods- Product analysis, intermediate criteria (isolation, trapping and detection) - Isotopic labeling and cross over experiments- Stereochemical evidence.

Self-study: Tautomerism -keto -enol, amido -imido and nitro -acinitro systems, Primary and secondary kinetic isotopic effects.

Unit-2 - Electrophilic substitution reactions **13Hrs**

Aliphatic electrophilic substitution reactions – Mechanism

SE1, SE2 and SEi mechanism. Factors affecting reactivity in SE reactions - Typical reactions – hydrogen exchange and migration of double bond, halogenation of carbonyl compounds.

Aromatic electrophilic substitution reactions

Arenium ion mechanism - orientation and reactivity in mono substituted benzene rings – steric effects and ortho/para ratios - ipso attack, orientation in di-substituted benzene rings. Typical reactions - Friedel Crafts alkylation & acylation, Vilsmeier-Haack reaction, Gattermann-Koch reaction, Hofmann-Martius, Jacobsons reaction, Houben-Hoesch reaction, Diazonium coupling.

Self-study: Stork enamine reactions, cyclic mechanism, Bradsher reaction and Bischler-Napieralski reaction

Unit-3 - Nucleophilic substitution reactions 13Hrs

Aliphatic nucleophilic substitution

S_N1, S_N2 and S_Ni reactions and mechanisms - factors affecting nucleophilic substitution reaction - ambident nucleophiles and ambident substrates. Substitution at vinyl carbon and allylic carbon - hydrolysis of esters ($A_{Ac}1$, $A_{Ac}2$ and $B_{Ac}2$ only). Typical reactions - Wurtz reaction - Claisen and Dieckmann condensation - Williamson reactions.

Aromatic nucleophilic substitution: S_NAr - benzyne mechanism - Zeigler alkylation - Chichibabin reaction - Vonbraun reaction - Cine substitution.

Self-study: Neighbouring group participation by σ and π bonds, anchimeric assistance, Rosendmund Reactions, Von Richter rearrangement

Unit-4

Addition and elimination reactions 13Hrs

Addition to C-C and C-O multiple bonds - electrophilic, nucleophilic and free-radical additions - additions to conjugated systems - orientation - Birch reduction - hydroboration - Michael condensation - 1,3 dipolar additions - Diels-Alder reactions - carbene addition to double bonds - hydration of olefines.

Elimination reactions-E1, E2, E1cB - stereochemistry of elimination, Hofmann and Saytzeff's rules - elimination versus substitution - pyrolytic cis elimination.

Self-study: Mannich reaction - Meerwein-Pondorf reduction - Darsen - Wittig - Thorpe and benzoin condensations, Chugaev reaction – dehydration of alcohols, dehydro halogenation of vicinal dihalides, Hofmann degradation, Cope elimination

Unit-5

Reactive Intermediates 13Hrs

Classical and non-classical carbocations, carbanions, radical- anions, radical-cations, carbenes, arynes and nitrenes. General methods of generation**,** detection and reactivity of these intermediates.

Types of free radical reactions, Mechanism of free radical reaction, mechanism at an aromatic substrate, Reactivity in aliphatic substrate, alkenes, alkyl side chain aromatic compound and at bridgehead. Effect of solvent on reactivity.

Self-study: Sandmeyar, Gomberg, Ullman, Pschorr and Hunsdiecker reactions.

Power point Presentations, Group discussions, Seminar, Quiz, Assignment, Experience Discussion, Brain storming activity and Case study.

Web links:

https://www.youtube.com/watch?v=T1ePwEQ4Fa0
https://www.youtube.com/watch?v=QkQUJhJYPA0
https://www.youtube.com/watch?v=hsBn-BxuN0M
https://www.youtube.com/watch?v=RtV_JxzZoss
https://www.youtube.com/watch?v=-D8tYR3LTsI

Text Books:

1. Mukherjee, S.M and Singh, S.P. (2004), *Reaction Mechanism in Organic Chemistry*. 10th Edition, Macmillan India Ltd.
2. Agarwal, O.P. (2014), *Reactions and Reagents in Organic Chemistry*. 49th Edition. Goel publishing house.
3. Ahluwalia, V.K. Rakesh K. Parashar (2010). *Organic Reaction Mechanisms*. 4th Edition. Narosa Publsihing House.
4. Tewari, Vishnoi, K.S, (2006). *Text book of Organic Chemistry*. 3rd Edition. Vikas Publication.
5. JagadambaSingh and Yadav, L.D.S, (2014), *Advanced Organic Chemistry*. 20thEdition. Pragati prakasham publishers.

Reference Books:

1. Finar, I.L. (2002) *Organic Chemistry. Vol.1*. 5th Edition. Pearson India Ltd.
2. Jerry March (2007) *Advanced organic chemistry*. 4th Edition, A Wiley-Interscience.
3. Morrison, R.T, Boyd, R.N (2013) *Organic Chemistry*.7th Edition. Pearson India Ltd.
4. Skyes, P, (2001), Guide Book to Mechanism in Organic Chemistry, Pearson Education.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	3
CO2	3	3	3	2	3
CO3	3	3	3	1	2
CO4	3	3	3	2	3
CO5	3	3	3	2	3

3-High; 2-Medium; 1-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.K.Poonkodi Signature:	Name: Dr.K.Poonkodi Signature:	Name: Mr.K.Srinivasan Signature:	Name:Dr.R. Muthukumaran Signature:

Programme code:	M.Sc.	**Programme Title :**	Master of Chemistry	
Course Code:	**20PCY412**	**Inorganic Chemistry - III Bioinorganic and Inner Transition Elements**	**Batch :**	2020-2022
			Semester	IV
Hrs/Week:	5	**Total Hrs: 65**	**Credits:**	5

Course Objective

- To allow the students to get introduced to the study of inner transition elements.
- To acquire knowledge in the nature, preparation and properties metal carbonyl complexes, photochemistry of metal complexes.
- To gain knowledge about various applications and the role of metals in biological systems.

Course Outcomes (CO)

K1	CO1	Remember the general properties of Inner Transition elements and applications of inorganic metal complexes in photochemistry.
K2	CO2	Understand the magnetic properties of Inner Transition elements and homogeneous catalysis of organometallic.
K3	CO3	Apply the catalytic property of organometallic in synthesis.
K4	CO4	Analyze the mechanism involved in organometallic and the biological function of essential and non- essential elements.
K5	CO5	Evaluate the importance of biological function of certain metals.

Unit-1

Chemistry of Inner transition elements **13 Hrs**

Color and complex formation inner transition elements- comparison between‘d’ and ‘f’ block elements - magnetic properties of Lanthanides and Actinides - complex formation and color absorption spectra of lanthanides and actinides. Comparison between lanthanides and actinides.

Self-study: Use of lanthanide compounds as shift reagents

Unit-2

Homogeneous catalyst by organometallics **13 Hrs**

Olefin hydrogenation, olefin dimerization and metathesis, Monsanto acetic acid synthesis, olefin isomerization, Wacker oxidation of alkenes, hydroformylation, water gas shift reaction, template synthesis, alkene hydrosilation, acetic acid from ethylene. Heterogeneous catalysis - Zieglar- Natta Catalysis.

Self-study: Types of reactions in Homogeneous catalyst- Zeise’s salt, Vaska complexes

Unit-3 **13 Hrs**

Inorganic Photochemistry

Introduction, $[Ru(bipy)_3]^{2+}$ complexes in solar energy, Photochemical reactions of metal carbonyls, Photolysis of water. Photochemistry of metal beta diketonates.

Insertion reaction- Introduction - CO insertion and SO_2 insertion reactions - insertion involving alkenes.

Oxidative addition and reductive elimination- Introduction, one-electron oxidative addition-addition of oxygen-mechanism, 5-coordinate 18-electron reactants, 4-coordinate 16-electron reactants, 4-coordinate 18-electron reactants.

Self-study: concerted Vs free radical mechanism, reductive elimination

Unit-4

Bioinorganic chemistry:I **13 Hrs**

Essential and non-essential elements, Biochemistry of Sodium and Potassium - The Sodium-Potassium pump - Biochemistry of Calcium-Storage and transport of Calcium-Calmodulin-Muscle constaction and blood clotting-Biochemistry of Copper- Stuctural features of different Copper proteins- Storage and transport of Copper.

Self-study: Biological Function and toxicity of Some Elements (Cr, Mn, Co, Ni, Se, Mo, Cd, Pb)

Unit-5

Bioinorganic Chemistry:II **13 Hrs**

Metalloporphyrins (heme and non-heme proteins) - cytochromes, heomoglobin, myoglobin, chlorophyll, ferridoxins, rubredoxins - Vitamin B_{12} and B_{12} coenzymes (structure and functions) - nitrogen fixation (invitro and invivo) - Metallo enzymes - Carboxypeptidase - Metallo drugs for cancer theraphy (Cis-platin).

Self-study: Cytochrome-P-450 and Carbonic anhydrase

Power point Presentations, Group discussions, Seminar, Quiz, Assignment, Experience Discussion, Brain storming activity and Case study.

Web links:

https://www.youtube.com/watch?v=7qb1RDkU9BU
https://www.youtube.com/watch?v=OgqPPFg4t6s
https://www.youtube.com/watch?v=6fRxAjMdMvE&list=PLR-lh4Ip2fLusw2XTKlgOS9c5sGHCDlqW
https://www.youtube.com/watch?v=k7Bf9p4-Kzo
https://www.youtube.com/watch?v=vnVMS_Dp0dU
https://www.youtube.com/watch?v=HkgsP0Jlc_o
https://www.youtube.com/watch?v=darVtuigUJA
https://www.youtube.com/watch?v=xzyR8Nsxloc
https://www.youtube.com/watch?v=plhLipR8yYQ

Text Books:

1. Gurdeep Raj. (2014). *Advanced Inorganic Chemistry*. 12th Edition. Geol Publishing House
2. Madan. R.D. (2011). *Advanced Inorganic Chemistry*. 3rd Edition. S. Chand & company, New Delhi.
3. Malik, U.K, Tuli, G.D & Madan, R.D (2010) *Selected Topics in Inorganic Chemistry*, S. Chand Publication.
4. Asim K. Das. (2015). *Bio-inorganic chemistry*. Books and Allied Pvt. Ltd.
5. Lehinger. ( ) *Bio-inorganic chemistry*.

Reference Books:

1. Keith F. Purcell, John. C. Kotz. (1997). *Inorganic chemistry*, Holt- Saunders International Editions.
2. James E. Huheey. (1993). *Inorganic Chemistry*, Fourth edition, HarperCollins College Publishers. (Units I, II, III, IV)
3. Basolo, F. & Pearson. R.G. (1967) *Mechanisms of Inorganic Reactions: Study of Metal Complexes in Solution.* Wiley Eastern Limited.
4. IvanoBertini, Harry B. Gray, Stephen J.Lippard, and Joan Selverstone Valentine. (1998). *Bioinorganic Chemistry*, VIVA books private Ltd. (Units III, IV).

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	2	3
CO2	3	1	2	2	2
CO3	3	1	3	1	3
CO4	3	2	3	1	3
CO5	3	3	3	3	3

3-High; 2-Medium; 1-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Ms. R.Mini Signature:	Name:Dr.K.Poonkodi Signature:	Name: Mr.K.Srinivasan Signature:	Name:Dr.Muthukumaran Signature:

Programme code:	M.Sc.	**Programme Title :**	Master of Chemistry	
Course Code:	**20PCY414**	**Phytochemical techniques and health chemistry**	**Batch :**	2020-2022
			Semester	IV
Hrs/Week:	**Self-study**		**Credits:**	1

Course Objective

- To enable post graduate students in Chemistry to gain knowledge on phyto chemical techniques.
- To enable them to be familiar with techniques of extraction, separation and purification and simple identification strategies of drugs/natural products.
- To acquaint with health and hygiene food system along carbohydrates and vitamins.
- To learn the mode of mechanism for common diseases.

Course Outcomes (CO)

K1	CO1	Understanding on necessity and role of carbohydrates and vitamins for humans.
K2	CO2	Remember the phytochemical techniques -extraction, separation and purification.
K3	CO3	Implement the basic values and analyze the functions of food, food pyramid and hygiene food system.
K4	CO4	Evaluate the mechanism for biological function of carbohydrates and vitamins
K5	CO5	Analyze the mechanism and causes of common diseases

Unit I- Extraction strategies of drugs/natural products

Extraction Techniques - Cold and hot extraction methods, liquid-liquid extraction techniques, liquid-carbon dioxide extraction, concentration and evaporation techniques, lyophilisation, principles and technique of simple distillation -reduced pressure distillation-fractional distillation- steam distillation-rotary evaporation and centrifugation.

Unit II-Separation Techniques of drugs/natural products

Separation Techniques – Simple crystallization- experimental aspects – solvents for crystallization. Special methods– flavanoid, pigment extraction - GC-MS, LC-MS-identification of phytochemicals by NIST Library

Unit III- Purification Techniques of drugs/natural products

Purification Techniques – Preliminary methods of identification of extracts – Cermin chemical aspects-colour tests – TLC and fluorescent characteristics, proximate

methods.Theory of melting and freezing – melting point and vapour pressure., Biological assays- antibacterial, antifungal, antioxidant and invitro anticancer activities.

Unit IV- Health

Definition: - Food, Food Pyramid, Health, Hygiene, mal under over nutrition, their causes and remedies, sanitation.

Carbohydrates: Classification, biological functions,Vitamins: Classification, biological functions.

Unit V-Common diseases

Toxicants in food cancer, types and causes, common diseases- jaundice, vomiting, fever, rickets, scurvy, beriberi, pellagra, gout, goiter, diabetes anemia, night blindness, ulcer, their causes.

Web links:

https://www.youtube.com/watch?v=hf6nPZjOTXo
https://www.youtube.com/watch?v=gU2st5-T1Go
https://youtu.be/LcEmwSjnLZE
https://www.youtube.com/watch?v=_Z0OCjS5EZQ
https://www.youtube.com/watch?v=GJFb_ghEFB4

Text Books:

1. Harborne. J. B,(2008), *Phytochemical methods-A guide to modern techniques of Plant analysis*, 3rdedition,Springer publication.
2. Ahluwalia &Madhu Chopra. V.K, (2008), *Medicinal Chemistry*, Ane Books India.
3. Ashutoshkar, (2010), *Medicinal Chemistry*, 5th Edition, New Age international publishers.
4. Jayashree Ghosh, (1999), *A Textbook of Pharmaceutical Chemistry*, S. Chand and Co. Ltd.
5. Alex V Ramani, (2009),*Food Chemistry*, MJP Publishers, Chennai.
6. Satake M and Mido Y, (2003),*Chemistry for the Health Science*, Discovery Publishing House, New Delhi.

Reference Books:

1. Graham L. Patrick, (2009),*An Introduction to Medicinal Chemistry*, 4th Indian Edition, Oxford publishers,
2. Krishnaswamy. N. R, (2010), *Chemistry of Natural Products*, 2ndEdition,An Unified Approach –Unified Press.
3. Krishnaswamy. N. R, (2003), *Chemistry of Natural Products A Laboratory Handbook*,1st Edition, University press India Pvt. Ltd.

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3
CO2	3	3	3	3	2
CO3	2	3	3	2	3
CO4	3	3	3	3	1
CO5	3	3	3	3	3

3-High; 2-Medium; 1-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.V.Prabhu Signature:	Name:Dr.K.Poonkodi Signature:	Name: Mr.K.Srinivasan Signature:	Name: Dr.R.Muthukumaran Signature: