List of Revised Courses

Department : *Chemistry*

Program Name : *B.Sc.*

Academic Year : 2019-20

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	SEC-1	Skill Enhancement Course-1
02.	SEC-2	Skill Enhancement Course-2

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2019-20

School : *School of Physical Sciences*

Department : *Chemistry*

Date and Time : *April 25, 2019 – 04:00 PM*

Venue : *Faculty room of New Chemistry Building*

The scheduled meeting of member of Board of Studies (BoS) of Department of Chemistry, School of Studies of Physical Science, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the content of each paper of U.G. (CBCS), P.G. (ECS) and Ph. D Course work (ECS).

The following members were present in the meeting:

1. Prof. Prof. Alok Mittal, (External Expert Member BoS, Dept. of Chemistry, MNIT, BHOPAL)
2. Prof. G. K. Patra (Member BoS, Dept. of Chemistry)
3. Dr. Bhaskar Sharma (HOD, Assistant Prof., Dept. of Chemistry.-cum Chairman, BOS)
4. Dr S. K. Singh (Member BoS, Associate Professor, Dept. of Chemistry)
5. Dr. Subhash Banerjee (Member, Assistant Professor, Dept. of Chemistry)

Following points were discussed during the meeting

1. The course content of Ph. D. Course work teaching was modified in light of incorporation of Computer Applications and other slight modification of course content.
2. The syllabi of Skill Enhancement Course (SEC) of B.Sc. III and B.Sc. IV sem. were also modified.

The committee discussed and approved the scheme and syllabi. The following courses were revised in the of B. Tech. Final year (VII and VIII Semesters) :

- Skill Enhancement Course-1 (SEC-1)
- Skill Enhancement Course-2 (SEC-2)
- Research Methodology & Computer Applications (SPC-R1)
- Thrust Area in Chemical Sciences (CH-R2)
- Seminar (CH-R3)

Signature & Seal of HoD

अध्यक्ष/Head
रसायन शास्त्र विभाग
Deptt. of Chemistry
गुरु घासीदास विश्वविद्यालय,
Guru Ghasidas Vishwavidyalaya,
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C.G.)

Scheme and Syllabus

SUMMER Internship: 15 days			**Swayam Swachhta / NSS / Industrial/ others**	**2**	**100**
III	Core-5	CBT-5	Inorganic Chemistry II	4	4
	Core -5 Practical	CBL-5	Inorganic Chemistry II: Practical	2	4
	Core -6	CBT-6	Organic Chemistry-II	4	4
	Core -6 Practical	CBL-6	Organic Chemistry-II : Practical	2	4
	Core - 7	CBT-7	Physical Chemistry-III	4	4
	Core – 7 Practical	CBL-7	Physical Chemistry-III: Practical	2	4
	Generic Elective -3		3A 3B 3C 3D	4	4
	Generic Elective - Practical			2	4
	Skill Enhancement Course (SEC - 1)		Select one from the Pool of SEC courses offered by different departments	4	2 (4)
			Total	28	34
IV	Core-8	CBT-8	Inorganic Chemistry III:	4	4
	Core -8 Practical	CBL-8	Inorganic Chemistry III: Practical	2	4
	Core -9	CBT-9	Organic Chemistry III	4	4
	Core -9 Practical	CBL-9	Organic Chemistry III: Practical	2	4
	Core - 10	CBT-10	Physical Chemistry-IV	4	4
	Core -10 Practical	CBL-10	Physical Chemistry-IV: Practical	2	4
	Generic Elective - 4		4A 4B 4C 4D	4	4
	Generic Elective - Practical			4	4
	Skill Enhancement Course (SEC -2)		Select one from the Pool of SEC courses offered by different departments	4*	2 (4)
			TOTAL	28	34
SUMMER Internship: 15 days			**Swayam Swachhta / NSS / Industrial/ others**	**2**	**100**
V	Core-11	CBT-11	Organic Chemistry IV	4	4
	Core -11 Practical	CBL-11	Organic Chemistry IV: Practical	2	4

SKILL ENHANCEMENT COURSE

SEC-1: BASIC ANALYTICAL CHEMISTRY
(Theory 02 Credits; Practicals 02 Credits)
Total 60 Lectures

Introduction: Introduction to Analytical Chemistry and its interdisciplinary nature. Concept of sampling. Importance of accuracy, precision and sources of error in analytical measurements. Presentation of experimental data and results, from the point of view of significant figures.

Analysis of soil: Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators

a. Determination of pH of soil samples.
b. Estimation of Calcium and Magnesium ions as Calcium carbonate by complexometric titration.

Analysis of water: Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods.

a. Determination of pH, acidity and alkalinity of a water sample.
b. Determination of dissolved oxygen (DO) of a water sample.

Analysis of food products: Nutritional value of foods, idea about food processing and food preservations and adulteration.

a. Identification of adulterants in some common food items like coffee powder, asafoetida, chilli powder, turmeric powder, coriander powder and pulses, etc.
b. Analysis of preservatives and colouring matter.

Chromatography: Definition, general introduction on principles of chromatography, paper chromatography, TLC etc.

a. Paper chromatographic separation of mixture of metal ion (Fe^{3+} and Al^{3+}).
b. To compare paint samples by TLC method.

Ion-exchange: Column, ion-exchange chromatography etc.
Determination of ion exchange capacity of anion / cation exchange resin (using batch procedure if use of column is not feasible).

Analysis of cosmetics: Major and minor constituents and their function

a. Analysis of deodorants and antiperspirants, Al, Zn, boric acid, chloride, sulphate.
b. Determination of constituents of talcum powder: Magnesium oxide, Calcium oxide, Zinc oxide and Calcium carbonate by complexometric titration.

25-04-19

Suggested Applications (Any one):

a. To study the use of phenolphthalein in traps cases.
b. To analyze arson accelerants.
c. To carry out analysis of gasoline.

Suggested Instrumental demonstrations:

a. Estimation of macro nutrients: Potassium, Calcium, Magnesium in soil samples by flame photometry.
b. Spectrophotometric determination of Iron in Vitamin / Dietary Tablets.
c. Spectrophotometric Identification and Determination of Caffeine and Benzoic Acid in Soft Drink.

Reference Books:

1. Willard, H. H. *Instrumental Methods of Analysis*, CBS Publishers.
2. Skoog & Lerry. *Instrumental Methods of Analysis*, Saunders College Publications, New York.
3. Skoog, D.A.; West, D.M. & Holler, F.J. *Fundamentals of Analytical Chemistry 6th Ed.*, Saunders College Publishing, Fort Worth (1992).
4. Harris, D. C. *Quantitative Chemical Analysis*, W. H. Freeman.
5. Dean, J. A. *Analytical Chemistry Notebook*, McGraw Hill.
6. Day, R. A. & Underwood, A. L. *Quantitative Analysis*, Prentice Hall of India.
7. Freifelder, D. Physical Biochemistry *2nd Ed.*, W.H. Freeman and Co., N.Y. USA (1982).
8. Cooper, T.G. *The Tools of Biochemistry*, John Wiley and Sons, N.Y. USA. 16 (1977).
9. Vogel, A. I. *Vogel's Qualitative Inorganic Analysis 7th Ed.*, Prentice Hall.
10. Vogel, A. I. Vogel's *Quantitative Chemical Analysis 6th Ed.*, Prentice Hall.
11. Robinson, J.W. *Undergraduate Instrumental Analysis 5th Ed.*, Marcel Dekker, Inc., New York (1995).

SEC-2: INTELLECTUAL PROPERTY RIGHTS (IPR)

(42 Credits)

Total 60 Lectures

In this era of liberalization and globalization, the perception about science and its practices has undergone dramatic change. The importance of protecting the scientific discoveries, with commercial potential or the intellectual property rights is being discussed at all levels – statutory, administrative, and judicial. With India ratifying the WTO agreement, it has become obligatory on its part to follow a minimum acceptable standard for protection and enforcement of intellectual property rights. The purpose of this course is to apprise the students about the multifaceted dimensions of this issue.

Introduction to Intellectual Property:
Historical Perspective, Different Types of IP, Importance of protecting IP.

Copyrights
Introduction, How to obtain, Differences from Patents.

Trade Marks
Introduction, How to obtain, Different types of marks – Collective marks, certification marks, service marks, Trade names, etc. Differences from Designs.

Patents
Historical Perspective, Basic and associated right, WIPO, PCT system, Traditional Knowledge, Patents and Healthcare – balancing promoting innovation with public health, Software patents and their importance for India.

Geographical Indications
Definition, rules for registration, prevention of illegal exploitation, importance to India.

Industrial Designs
Definition, How to obtain, features, International design registration.

Layout design of integrated circuits
Circuit Boards, Integrated Chips, Importance for electronic industry.

Trade Secrets
Introduction and Historical Perspectives, Scope of Protection, Risks involved and legal aspects of Trade Secret Protection.

Different International agreements

(a) Word Trade Organization (WTO):

(i) General Agreement on Tariffs & Trade (GATT), Trade Related Intellectual Property Rights (TRIPS) agreement

(ii) General Agreement on Trade related Services (GATS)

(iii) Madrid Protocol

(iv) Berne Convention

(v) Budapest Treaty

(b) Paris Convention

WIPO and TRIPS, IPR and Plant Breeders Rights, IPR and Biodiversity

IP Infringement issue and enforcement – Role of Judiciary, Role of law enforcement agencies – Police, Customs etc. Economic Value of Intellectual Property – Intangible assets and their valuation, Intellectual Property in the Indian Context – Various laws in India Licensing and technology transfer.

Reference Books:

1. N.K. Acharya: *Textbook on intellectual property rights*, Asia Law House (2001).
2. Manjula Guru & *M.B.* Rao, *Understanding Trips: Managing Knowledge in Developing Countries*, Sage Publications (2003).
3. P. Ganguli, Intellectual Property Rights: *Unleashing the Knowledge Economy*, Tata McGraw-Hill (2001).
4. Arthur Raphael Miller, Micheal H.Davis; *Intellectual Property: Patents, Trademarks and Copyright in a Nutshell*, West Group Publishers (2000).
5. Jayashree Watal, *Intellectual property rights in the WTO and developing countries*, Oxford University Press, Oxford.

SEC-3: GREEN METHODS IN CHEMISTRY
(Theory 02 Credits; Practicals 02 Credits)
Total 60 Lectures

Tools of Green chemistry, Twelve principles of Green Chemistry, with examples.

The following Real world Cases in Green Chemistry should be discussed:

1 A green synthesis of ibuprofen which creates less waste and fewer byproducts (Atom economy).
2 Surfactants for Carbon Dioxide – replacing smog producing and ozone depleting solvents with CO_2 for precision cleaning and dry cleaning of garments.
3 Environmentally safe antifoulant.
4 CO_2 as an environmentally friendly blowing agent for the polystyrene foam sheet packaging market.