

Title of the Course: Chemistry in Daily Life- I

Course Code: MDCCHM1

Nature of the Course: NATURAL SCIENCE

Total Credits: 3

Distribution of Marks: 40 (End Sem) (TH) + 30 (In-Sem)

Course Objective: The course introduces the students to the fascinating chemistry of some food products. Keeping the importance of food industry in mind this course is aimed to introduce food packaging, processing and preservation.

Learning Outcome: At the end of this course, students will be able to understand the composition, processing and analysis of dairy products, to learn about the various food preservatives and artificial food colorants and their role in food processing industries, to aware the adverse effects of food adulterants in human health.

UNITS	CONTENTS	L	T	P	Total Hours
I	Dairy Products: Composition of milk and milk product. Principles of dairy safety; Milk processing.. Qualitative analysis of fat content, minerals in milk and butter. Qualitative analysis of caffeine in coffee and tea, detection of chicory in coffee, chloral hydrate in toddy. Marks: 10	10	-	-	10
II	Food additives: Food preservatives like benzoates, propionates, sorbates, disulphites. Artificial sweeteners: Aspartame, saccharin, dulcin, sucralose, and sodium cyclamate. Flavors: Vanillin, alkyl esters (fruit flavors), and monosodium glutamate. Marks: 10	10	-	-	10
III	Food adulterants, and contaminants: Food processing and packaging; Food adulteration: definition and its importance, adulterants present in coffee, tea, milk, spices, grains and food colour; Difference between food adulteration and contamination Marks: 10	10	-	-	10
IV	Artificial food colorants: Natural and synthetic colors, fake colors, inorganic pigments, application of colors in food industry,	10			10

	flavoring agents, Coal tar dyes and non-permitted colors and metallic salts. Utility of coal tar dyes in food and cosmetics and its harmful effect. Marks: 10				
Total	Marks: 40	40	0	0	0

L: Lectures

T: Tutorials

P: Practical

MODES OF IN-SEMESTER ASSESSMENT: 30 Marks

Two Internal Examination - 20 Marks

Others - 10 Marks

- o Assignment/Seminar
- o Lab note book/Attendance
- o Group Discussion

Recommended Books:

1. Food Science & Quality Control by SMT. B. Poornima - Centrum Press First edition 2014.
2. Post-Harvest Management of Horticultural crops - S. Saraswathy, T.L. Preethi AGROBIOS (India) 2013.
3. A Handbook of Agn. Food processing and marketing by S.C. Gaur, Agro Bios (India) 2012.
4. Quality Control for value edition in Food processing – by Dev Raj, Rakesh Sharma & V.K. Joshi New India Publishing Agency, 2011.
5. Food processing and preservation – Subbulakshmi, G. Shobha, A. Udipi, New Age International (P) Ltd., 2006.

B. A/B.SC. IN MATHEMATICS PROGRAMME (NEP)

DETAILED SYLLABUS OF 1st SEMESTER

Title of the Course	History of Mathematics
Course Code	MDCM101
Nature of the Course	MDC
Total Credits	03(L=2, T=1,P=0)
Distribution of Marks	(TH)+ (IA)=

Course Learning Outcomes: This course will enable the students to:

- Introduce the historical perspective of mathematics such as numerical symbol, word numerals, place value notation.
- Explain the arithmetic algorithms, construction of sine tables and Diophantine equation in ancient and medieval India.
- Explain how mathematics has evolved in India.
- Analyze and critically reflect on ancient and modern mathematical issues.
- Conduct historical research on ancient Indian mathematical ideas with the texts of classical mathematics and their historical interpretation.
- Explain some of the mathematical concepts developed in ancient time and evaluate the relevance in modern mathematics and sciences.

UNITS	CONTENTS	L	T	P	Total Hours	Total Marks
I	A glimpse of ancient India; Hindus and mathematics; Scope and development of Hindu mathematics.	06	01	-	07	
II	Numeral terminology; The development of Numerical Symbol; The decimal place-value system; Persistence of the old system; Word numerals; Alphabetic notations; The zero symbol; The place-value notation in Hindu literature.	10	01	-	11	
III	Euclid: Introduction to the Elements; Book I and Pythagorean Theorem; Book II and Geometric Algebra. Archimedes; Estimating the values of pi. Ramanujan's view on Magic square.	13	01	-	14	
IV	Ancient and Medieval India: Arithmetic algorithms; Geometry; Linear congruence; Construction of Sine tables; Transmission to and from India. Diophantine Equations in Greece and India; Early Mathematics in India. Linear Equations in One and Two unknown. The Rule of three	12	01	-	13	
	Total	41	04	-	45	

Where, **L: Lectures**

T: Tutorials

P: Practicals

Recommended TextBooks:

1. History of Hindu Mathematics (Part I), Datta B., Narayan Singh A., Gyan Publishing House, 2021.
2. A History of Mathematics: An Introduction, Katz Victor J., Pearson, 2009
3. Ramanujan's Notebooks: Part I, Berndt Bruce C., Springer, 1985.
4. The History of Mathematics: An Introduction, Burton David M., Mc Graw Hill, 2011.

Semester (I)

Open Elective: (I)

Paper Name: Physics for All (Credit: 3)

Total Marks: 60

Unit-I Energy and Power: Explosions and energy; Energy, heat and its units; Energy table and discussions; Discussion of cost of energy; Measuring energy; Power; Different power sources; Kinetic energy. (10)

Unit-II Gravity, Force and Space: The force of Gravity; Newton's third law; Weightlessness; Low earth orbit; Geosynchronous satellites; Spy satellites; Medium Earth Orbit satellite; Circular Acceleration; momentum; Rockets; Airplanes, helicopters and fans; Hot air and helium balloons; angular momentum and torque. (20)

Unit-III Nuclei and radioactivity: Radioactivity; Elements and isotopes; Radiation and rays; Seeing radiation; The REM – The radiation poisoning; Radiation and cancer; The linear hypothesis; Different types of radiation; The half-life rule; Smoke detectors; measuring age from radioactivity; Environmental radioactivity; Glow of radioactivity; Nuclear fusion. (30)

Reference Books:

Physics and Technology for Future Presidents: An Introduction to the Essential Physics Every World Leader Needs to Know" by Richard A Muller, WW Norton and Company, 2007.

**SYLLABUS FOR MULTI-DISCIPLINARY COURSE ON SOCIAL SCIENCES
UNDER NEP, 2023**

Title of the Course	: Multi-Disciplinary Course on Social Sciences
Course Code	:
Nature of the Course	: Multi-Disciplinary
Total Credits	: 3
Distribution of Marks	: 70 (End Sem) + 30 (In-Sem)

The multi-disciplinary course on Social Sciences is prescribed for undergraduate 1st Semester students of science and commerce subjects under National Education Policy, 2023. The primary objective of this course is to acquaint the undergraduate students about the basic foundations of the expansion of various disciplines/ subjects, which will help them in preparing for acquiring lateral knowledge of the relevant disciplines after being graduated. The proposed course endeavours to cover these areas with an inter-disciplinary approach.

Course Structure:

The Multi-disciplinary Course shall cover the following areas in total 5 (five) units:

- I. Main Currents of Indian History (14 Marks)
- II. Indian Polity & Human Rights (14 Marks)
- III. Major Features of Indian Economy (14 Marks)
- IV. Basics of Education & Pedagogy (14 Marks)
- V. Indian Society and Social Institutions (14 Marks)

Unit I: Main Currents of Indian History (15 Classes, Marks 14)

Indus and the Vedic Culture- Basic Features, States in Early India- Mahajanapadas and Empires- Maurya and Gupta Religious Movements, Basic Teachings of Buddhism and Jainism, Medieval India- Sultanate and the Mughal rule, State and Administration, Colonial Times-19th century reforms and Constitutional Developments till 1935, Freedom Struggle of India- Major Phases

Unit II: Indian Polity & Human Rights (15 Classes, Marks 14)

Constitutional Developments, Framing of the Constitution, Features of the Indian Constitution, Preamble, Citizenship, Fundamental Rights and Duties, The Directive Principles of State Policy, Structure of the Government, Features of Federalism in India, Party System in India
Meaning and Development of Human Rights, International conventions- UDHR, International Covenant on Civil and Political Rights, International Covenant on Socio- Economic and Cultural Rights, Institutional mechanisms- National Commission for Human Rights, State Commission for Human Rights

Unit III: Major Features of Indian Economy (15 Classes, Marks 14)

Main Features of Indian Economy Natural and Human resources, Overview of Indian agriculture- broad features- Cropping Pattern, Land Reforms, Green Revolution, Agricultural

Finance & Marketing, Agriculture price policy, Shifting cultivation. Industry & Tertiary sectors in India- Achievements and failures of industrial sector, Industrial policy, Causes of slow pace of industrial growth, problems & prospects of Small-Scale Industries and Cottage Industries- Development in tourism sector. Economic planning & Economic Reforms, Five-Year Plans, NITI Ayog, Economic Reforms since 1991- Liberalization, Privatization and Globalization.

Unit IV: Basics of Education & Pedagogy (15 Classes, Marks 14)

Types of education: Formal, Informal, and Non-formal. Recent modes of education: Continuing, Distance and Adult education. Understanding concepts of developmental psychology: Physical, Mental, Social and Emotional development at various stages of human life, viz., Infancy, Childhood & Adolescence. Factors affecting human development: Home, School, and Society. Role of heredity and environment and its developmental implications. Concept and Factors of Learning: Cognitive, Affective and Psycho-motor learning. Adjustment: Concept, Nature, Problems of Adjustment and Mechanisms of Adjustment. Principles of Teaching and Learning, Methods and Approaches of Teaching. Significance and Uses of Educational Technology in modern classroom teaching.

Transaction of the Course:

- A. The faculty of the concerned subject shall teach the concerned unit(s) of the syllabus.
- B. For convenience of the transaction of the course, the following table may be followed:
Unit(s)

Examination & Evaluation:

Modes of In-Semester Assessment	: 30 Marks
Two Sessional Tests	: 10+ 10= 20 Marks
Seminar/ Group discussion/ Assignment	: 5 Marks
Attendance	: 5 Marks
Final Examination	: 70 Marks

Title of the Course : Natural Resource Management

Course Code : MDC 101

Nature of the Course : Multi Disciplinary Course

Total Credits : 03

Distribution of Marks : 70 (End Sem.) + 30 (In-Sem.)

COURSE OBJECTIVES: *The objective of this course is to provide knowledge to the students on importance, sustainable utilization, conservation and management of natural resources.*

UNITS	CONTENTS	L	T	P	Total Hours
I 15 MARKS	Natural resources: Definition and types. Natural resources of NE India.	8	01	-	09
II 20 MARKS	Sustainable utilization of land and water resources; Soil degradation and management; water resources and their management. Renewable and non-renewable sources of energy.	12	01	-	13
III 15 MARKS	Forests: Definition, Significance; Types of vegetation in India; NTFC Depletion and Management, JFM.	08	02	-	10
IV 20 MARKS	Contemporary practices in resource management: EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint, Resource Accounting; Waste management. National and international efforts in resource management and conservation	10	03	-	13
	Total	38	07	-	45

Where,

L: Lectures

T: Tutorials

P: Practicals

MODES OF IN-SEMESTER ASSESSMENT:

(30 Marks)

- Two Sessional Examinations 20 Marks
- Attendance 5 Marks
- Assignment/Seminar 5 Marks

LEARNING OUTCOMES:

1. Know about the natural resources, its types, sustainable utilization and management practices.

SUGGESTED READINGS:

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi

