

**Manonmaniam Sundaranar University
Tirunelveli – 627 012**

University Departments

Integrated PG Degree Programmes

**Odd & Even semesters /
Semester - III (July – November 2018) &
Semester - IV (December 2018 – April 2019)**

**List of Non-Major Elective Courses offered by
University Departments**

List of Non-Major Elective Courses offered by the University Departments for Integrated PG Programmes in this Odd semester (July - November 2018) – Semester III & Even semester (December 2018 – April 2019) - Semester – IV) :

Sl. No (1)	University Department / Centre (2)	Integrated P.G. Programmes offered (3)		Non-Major Elective Courses offered under Integrated PG Programme as per the SCAA approval / ratification (4)	Title of the Non-Major Elective course offered in the Odd Semester (III) (July-November 2018) (5)	Title of the Non-Major Elective course offered in the Even Semester (IV) (December 2018-April 2019) (6)
1	Chemistry	1	M.Sc. Chemistry	1. Food Chemistry 2. Water Management 3. Applied Chemistry 4. Clinical Chemistry	Water Management	Applied Chemistry
2	Communication	2	M.Sc. Electronic Media	1. Basic Photography 2. Videography	Basic Photography	Videography
3	Mathematics	3	M.Sc. Mathematics	1. Basic Mathematics 2. Discrete Mathematics	Basic Mathematics	Discrete Mathematics
4	Physics	4	M.Sc. Physics	1. Conventional and Non-conventional Energy Sources 2. Biomedical Instrumentation	Conventional and Non-conventional Energy Sources	Biomedical Instrumentation

DEPARTMENT OF CHEMISTRY

Integrated Chemistry

2016-17 / MSU / Univ. Depts / Integ.M.Sc.Chemistry/ Sem.- III / Ppr.- 11 / NME -1(b)

NON-MAJOR ELECTIVE

WATER MANAGEMENT

Objectives:

To realize the importance of quality water in day to day life

Unit I WATER POLLUTION

Definition-sources of water pollution-types of water pollutants: sewage and domestic wastes, industrial effluents, agricultural discharges, detergents, disease causing agents and radioactive materials. Eutrophication and its effects.

Unit II WATER QUALITY PARAMETERS

Physical, chemical and biological water quality parameters-water quality standards for drinking water –BIS and WHO. Determination of pH, Total hardness, DO, BOD and COD.

Unit III WATER PURIFICATION

Purification of water for drinking purposes: Sedimentation, filtration and disinfection-Desalination: reverse osmosis-Purification of water for industrial purposes: water softening-permutit process and ion-exchange process.

Unit IV WASTE WATER TREATMENT

Elementary ideas of waste water treatment: pre-treatment-primary treatment-secondary treatment: aerobic and anaerobic processes –tertiary treatment: evaporation adsorption – chemical precipitation.

Unit V RESTORATION AND MANAGEMENT

Importance of lakes and rivers-stresses on the Indian rivers and their effects –A restoration case study: Ganga Action Plan: objectives implementation and drawbacks. Rain water harvesting –water recycling- The water Prevention and control of Pollution Act 1974.

References :

1. A. K. De, Environmental Chemistry, Wiley Eastern Ltd., New Delhi.
2. B. K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut.
3. R. K. Trivedy and P. K. Goel, Chemical and biological methods for water pollution studies, Environmental Publications, Karad, India.
4. BIS 1991, Specification for drinking water, Bureau of Indian Standards, New Delhi
5. WHO 1992, International standards for drinking water, World Health Organisation, Geneva.

NON-MAJOR ELECTIVE

APPLIED CHEMISTRY

Objectives:

To acquire knowledge about the chemicals used in day to day life

Unit I SOAPS AND DETERGENTS

Soaps: Definition-classification-raw materials used in the manufacture of soap –manufacture of toilet soap.

Detergents: Definition –various types with examples- advantages of detergents over soaps – cleansing action of soap.

Unit II FERTILIZERS

Definition-characteristics of a good fertilizer- role of nitrogen, potassium and phosphorous in plant growth – natural fertilizers- chemical fertilizers: urea, muriate of potash and triple superphosphate - mixed fertilizers - biofertilizers – advantages of biofertilizers.

Unit III POLYMERS

Fibers: Classification –uses of terylene, nylon and orlon.

Resins: Natural resins- synthetic resins-type-uses of fevicol, quick fix, araldite, glyptal and Bakelite.

Plastics: classification- differences between thermoplasts and thermosets. Advantages of plastics-uses of polythene, PVC, polystyrene, Teflon and thermocole.

Rubber: Types-defects in natural rubber-vulcanization-synthetic rubbers- uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

Unit IV CHEMICALS IN PHARMACY

Definition and therapeutic uses of the following (an elementary study only)

Antiseptics: alum, boric acid

Mouth washes: Hydrogen peroxide

Antacids: Aluminium hydroxide

Analgesics: Aspirin, paracetamol

Antibiotics: Penicillins, tetracyclines

Haematinics: Ferrous fumerate, ferrous gluconate

Laxatives: Epsom salt, milk of magnesia

Sedatives: Diazepam

Unit V CHEMICALS IN DAY-TO-DAY LIFE

An outline of the preparation and uses of the following articles.

Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls.

Books for reference:

1. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.
2. Jeyashree Gosh, A text book of Pharmaceutical Chemistry, S. Chand and Company, NewDelhi.
3. B. N. Chakrabarty, Industrial Chemistry, Oxford and IBH Publishing Co. Pvt.Ltd., Calcutta.

DEPARTMENT OF COMMUNICATION

**5 years Integrated M.Sc Electronic Media
III Semester**

Non Major Elective

BASIC PHOTOGRAPHY

Objective

To introduce students to photography. To help them develop the skills involved in photography.

Unit I

Introduction to Photography, Characteristics of light, Human Eye and Camera – structure and function of camera, Exposure – focusing, aperture, shutter speed, Depth of field. Basic shots, angle, and view.

Unit II

Types of camera, Lens and its function, types of lenses and their use, Different styles of Photography – Portrait, Landscape and Documentary.

Unit III

Sources of Light – Nature, Artificial and Available. Lighting techniques – three point lighting.– Electronic flash and artificial lights, Light meters, Different kinds of filters.

Unit IV

Films, film speed and types of film, Papers - kinds of paper, developing and printing. Accessories used in photography.

Unit V

Digital photography, memory storage, resolution; understanding exposure and controls, Transferring image to PC, file formats, managing digital pictures.

Reference Books:

1. Julian Calder, John Garrett (1999). The 35 mm Photographer's Handbook, Marshall Editions Limited, London,
2. The Focal Encyclopaedia of Photography : Richard Zakia, LeatieStroebe
3. Dave Johnson (2001). How to do everything with your Digital Camera, Tata McGrawHill, New Delhi.
4. Lighting for Portrait Photography, Steve Bavister, Rotovision SA, 2001

5 years Integrated M.Sc Electronic Media
IV Semester
Non Major Elective
Videography

Objective

The students will be given theoretical exposure to Videography with additional practical classes.

Unit I

Understanding Videography, video formats-VHS, U-matic, beta, etc, characteristics of television medium television genres.

Unit II

Video Camera parts, shots, movements, angle, lenses, indoor-outdoor shooting, studio setup, single camera and multi camera production.

Unit III

Video production stages: pre-production, production, post production.

Unit IV

Lighting and sound – natural and artificial, dramatic effect and special effect lighting, three point, high key and low key lighting, basic of sound recording, microphones, sound manipulations.

Unit V

Editing- Types of editing, grammar of editing, transition editing the visual, editing the soundtrack

Reference Books:

1. Vasuki Belavadi (2008). Video Production, Oxford University Press.
2. Ken Pender (2002). Digital Video for the Desktop, Focal Press.
3. Esta De Fossard, John Riber (2005). Writing and Production for TELEVISION & FILM, Sage Publication.

DEPARTMENT OF MATHEMATICS

Integrated Mathematics

**2017-18 / MSU /Univ.Depts / Integ.M.Sc. Maths / Sem. –III / Non Major Elective -1
Non - major Elective**

Basic Mathematics

(45 hours)

UNIT I : Numbers - Face value and place value of a digit in a number - test of divisibility, Applications of algebraic formulae, unit digit - series. **(10**

hours)

UNIT II : H.C.F. and L.C.M. of numbers - factorization method - common division method, H.C.F. and L.C.M. of decimal fraction - comparison of fractions. **(10**

hours)

UNIT III : Decimal fraction- conversion of decimal into vulgar fraction-operation on decimal fractions- comparison of fractions-recurring decimal-mixed recurring decimal.

(9 hours)

UNIT IV: Simplification - BODMAS Rule - modulus of a real number - virnaculum - Some real life problems - missing numbers in the expression. **(8**

hours)

UNIT V: Square root and cube root - finding square root by factorization method- perfect square and perfect cube. **(8 hours)**

Text Book: Quantitative Aptitude – R.S. Aggarwal (2014), S. Chand & Co., Chapters 1 to 5

Non- Major Elective

Discrete Mathematics

(45 hours)

Unit I : Mathematical logic: Logical statement or proposition- type of propositions- the propositional calculus - the negation of a proposition- disjunction- conjunction- tautologies and contradictions- logical equivalence - the algebra of propositions- conditional propositions- converse inverse and contrapositive propositions-the negation of a conditional proposition- biconditional propositions- arguments.
(10 hours)

Unit II : Set theory: Set- set designation- null sets and unit sets- special sets of numbers- universal set- subsets, proper subsets and equal sets- set operations- union operations- properties of union operation- intersection- properties of intersection operation. **(10 hours)**

Unit III : Distributive properties- complementation- relative complement- properties of complement- properties of difference- symmetric difference- power set- Cartesian products.
(9 hours)

Unit IV : Relation and functions: Relation- equivalence relation- partition- partial order relation.
(8 hours)

Unit V : Function – inverse mapping- composition mappings- binary operations- countable and uncountable sets. **(8 hours)**

Text book: Discrete Mathematics - B. S. Vatssa , 3rd Edition , Wishwa Prakashan , Chapters 1, 2 (except 2.20) and 3.

DEPARTMENT OF PHYSICS

Integrated M.Sc. Physics

2017-18 / MSU /Univ.Depts / Integ.M.Sc. Physics / Sem. –III / Non Major Elective -1

CONVENTIONAL AND NON – CONVENTIONAL ENERGY SOURCES

Objective:

- To understand the different kinds of Energy Sources
- To study the basics of Renewable & Non-renewable energy sources
- To learn the fundamental principles and theory of Solar, Wind energy
- To understand the Biogas production from Biomass

L	T	P	C
3	0	0	3

UNIT- I: Conventional Energy Sources

Conventional energy sources: coal – oil – agricultural and organic waste – water power – Nuclear power – New energy technologies.

(9 hrs)

UNIT- II: Non-conventional Energy Sources: Solar energy

Basis of solar energy – solar radiation and its measurement – solar energy collector – Solar energy storage – applications of solar energy.

(9 hrs)

UNIT- III: Wind energy

Basic principles of wind energy conversion- the nature of the wind – the power of the wind – maximum power – wind energy conversion – basic components of wind energy conversion systems.

(9 hrs)

UNIT- IV: Bio mass energy

Basis of bio mass energy – bio mass conversion – technologies – wet process – dry process – photosynthesis. Bio gas plants – classification – methods of obtaining energy from bio mass. (9 hrs)

UNIT-V: Additional alternate energy sources

Geothermal energy sources – energy from ocean – chemical energy sources – hydrogen energy – magneto hydrodynamic – thermo electric power. (9 hrs)

hrs)

(Total : L =

45 hrs)

Books for study:

1. G. D. Rai, Non – Conventional Energy Sources, Khanna Publishers, New Delhi, 5th Edition, 2012.
2. Godfrey Boyle, Renewable Energy: Power for a sustainable Future, Alden Oess Limited, Oxford, 1996.
3. D. P. Kothari, K. C. Singal & Rakesh Ranjan, Renewable energy sources and emerging Technologies, Prentice Hall of India pvt. Ltd., New Delhi, 2008.

Books for references:

1. H.P. Garg and J. Prakash, Solar Energy Fundamentals and application, Tata McGraw- Hill Publishing company ltd, 1997.
- S. P. Sukhatme, Solar energy, Tata McGraw- Hill Publishing company ltd, 1997.

Non Major Elective - II : BIOMEDICAL INSTRUMENTATION

L	T	P	C
3	0	0	3

Objective:

- *The principle, design and working of various biomedical instruments are dealt in a simple manner.*
- *It will stimulate the students to understand the design and functioning of various medical equipment.*

UNIT – I: Biopotential Recorders

Characteristics of the recording system – Electrocardiography (ECG) - Electroencephalography (EEG) - Electromyography (EMG) – Electroretinography (ERG) – Electroculography (EOG).

(9 hrs)

UNIT – II: Physiological assist devices

Pacemakers – Pacemaker batteries - Artificial heartvalves - (Principle - block diagram and operation) – Defibrillators – Nerve and muscle stimulators – Heart –lung machine – Kidney machine. (9 hrs)

UNIT-III: Operation theatre equipment

Introduction – Surgical diathermy – Short-wave diathermy – Microwave diathermy – Ultrasonic diathermy – Ventilators - Anesthesia machine – Flowmeters – Blood flowmeter and its applications – Ultrasonic Blood flowmeter – Laser based Doppler blood flow meter.

(10 hrs)

UNIT – IV: Specialised Medical equipment

Blood cell counter – Electron Microscope – Radiation detectors – Geiger Muller Counter – Cloud chamber – X-ray tube & Machine – Radiography and Fluoroscopy – Image intensifiers – Angiography – Applications of X-ray examination.

(10 hrs)

UNIT – V: Advances in Biomedical Instrumentation

Computers in medicine – Lasers in medicine – Endoscopes– Nuclear imaging techniques – Computer tomography – Ultrasonic imaging systems – Magnetic resonance imaging.

(7 hrs)

(Total : L = 45 hrs)

Book for study:

1. M. Arumugam, Bio-medical Instrumentation, Anuradha Agencies, Chennai, 10th edition, reprint, 2013.

Books for references:

1. R.S. Khandpur, Handbook of Biomedical Instrumentation, Tata McGraw Hill Publishing Company Limited, Newdelhi, Reprint, 2002.
2. [Nandini K. Jog](#), Electronics in Medicine and Biomedical Instrumentation, PHI Learning Pvt. Ltd., 2nd Edition, 2013.