

Qualification for Admission

Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu with Physics as one of the subject in Higher Secondary Education.

Duration of the Course

The Students shall undergo the prescribed course of study for a period of three academic years (six semesters).

Subject of Study

- Part I: Tamil
- Part II: English
- Part III:
 1. Core Subjects
 2. Allied Subjects
 3. Electives
- Part IV :
 1. Non Major Electives
 2. Skill Based Subjects
 3. Environmental Studies
 4. Value Education
- Part V :
 - Extension activities

The scheme of Examination

The components for continuous internal assessment are:

Two tests and their average	--15 marks
Seminar /Group discussion	--5 marks
Assignment	--5 marks
Total	--25 marks

**Pattern of the question paper (Summative Examinations)
(For Part I, Part II, Part III , NME & Skilled Paper in Part IV)**

The question paper may have 3 parts.
Duration of the Summative Examinations is 3 hours

Part –A

Five questions (answer all) 5 x 02 = 10 Marks
(One question from each Unit)

Part –B

Five questions (‘either or ‘ type) 5 x 07 = 35 Marks
(One question from each Unit)

Part –C

Three questions out of five 3 x 10 =30 Marks
(One question from each Unit)

Total	75 Marks

Question paper pattern

(for part IV – Environmental Studies and Value Education only)

Part –A

Five questions (either or type) 5 x 06 =30 marks

Part –B

Three questions out of Five 3 x 15 = 45 marks

Total

75 marks

Note: No unit shall be omitted ;not more than two question from each unit

Pattern of the Question paper (Internal)

Part –A

Five questions (answer all) 5 x 02=10 Marks

Part –B

Two questions (‘either or ‘ type) 2 x 05=10 Marks

Part –C

One questions out of two 1 x 10 =10 Marks

Total

30 Marks

Pattern of the Question paper for Environmental Studies & Value Education only) (Internal)

Part –A

Four questions (‘either or ‘ type) 4 x 05=20 Marks

Part –B

One question (‘either or ‘ type) 1 x 10=10 Marks

Total

30 Marks

Minimum Marks for a Pass

1. 40% of the aggregate (Internal +Summative Examinationss).
2. No separate pass minimum for the Internal Examinations.
3. 27 marks out of 75 is the pass minimum for the Summative Examinationsss.

Program Specific Outcome

PSO1 Gives in-depth ideas and Description of atomic structure, Nuclear Reactor, Materials function, types of spectrum, medical equipments

PSO2 Covers concepts, definitions, properties of matter, Electricity, Electromagnetism, optics, atomic physics, Nuclear Physics, Digital Electronics, Material Science.

PSO3 Helps the students to analyze the circuit models and to design the circuit.

PSO4 Helps the students to solve the theoretical problems

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
B.Sc (Physics)
Table : I : Course pattern
(Those Who Joined in 2015-2016 and after)

Study Component	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem	Total Hours	Total Credits	No. Of Courses	Total marks
Part –I Tamil	6(3)	6(3)	6(3)	6(3)			24	12	4	400
Part – II English	6(3)	6(3)	6(3)	6(3)			24	12	4	400
Part –III										
Core Subjects	4(4)	4(4)	4(4)	4(4)	5(5) 5(5) 4(4)	5(5) 5(5) 4(4)	44	44	10	1000
Core Subject(P)	2(0)	2(2)	2(0)	2(2)	2(0) 3(0) 3(0)	2(5) 3(5) 3(5)	24	19	5	500
Allied Subject - I	6(4)	3(2) 3(2)	4(4)	2(2) 2(2)	-	-	20	16	6	600
Allied Subject – I (T)	4(4)	4(3)	4(4)	4(3)			24	16	6	600
Allied Subject – I (P)	2(0)	2(1)	2(0)	2(1)						
Allied Subject - II (T)			4(4)	4(3)	4(4)	4(3)	24	16	6	600

Allied Subject - II (P)			2(0)	2(1)	2(0)	2(1)				
Part – IV										
Skill Based Subject	2(2)	2(2)			2(2)	2(2)	12	12	6	600
Non Major Elective			2(2)	2(2)			4	4	2	200
EVS/ Value Education	2(2)	2(2)					4	4	2	200
Part – V										
Extension activities				0(1)			0	1	1	100
Total	30 (20)	30 (22)	30 (20)	30 (23)	30 (20)	30 (35)	180	140	46	4600

SEMESTER – III								
Subject Code	Subjects	No. Of Courses	Hours/ Week	Credits	Maximum Marks			
					Int	Ext	Tot	
15UTAG31	Tamil –III: Idaikkala Ilakkiyamum Puthinamum	1	6	3	25	75	100	
15UENG31	English-III: Language Through Literature-III	1	6	3	25	75	100	
15UPHC31	Medical Physics	1	4	4	25	75	100	
15UPHA31	Allied Mathematics – IV	1	4	4	25	75	100	
15UMTA31	Allied Physics– III Electricity and Electronics	1	4	4	25	75	100	For B.Sc Maths Students
15UMTAP2	Allied Physics Practical - II	-	2	-	-	-	-	
15UCHA31	Allied Chemistry – I Organic, Inorganic and Physical Chemistry – I	1	4	4	25	75	100	
15UCHAP1	Allied Chemistry Practical Volumetric Analysis	-	2	--	--	--	--	
15UPHCP2	Major Physics Practical - II	-	2	--	--	--	--	
15UBAN31	Business Management	1	2	2	25	75	100	
	TOTAL	6	30	20	--	--	600	

SEMESTER – IV								
Subject Code	Subjects	No. Of Courses	Hours/ Week	Credits	Maximum Marks			
					Int	Ext	Tot	
15UTAG41	Tamil – IV: Kappiya Ilakkiyamum Nadagamum	1	6	3	25	75	100	
15UENG41	English-IV: Language Through Literature-IV	1	6	3	25	75	100	
15UCHA41	Allied Chemistry - II Organic and Physical Chemistry-I	1	4	3	25	75	100	
15UCHAP1	Allied Chemistry Practical Volumetric Analysis	1	2	1	40	60	100	
15UPHC41	Optics and Spectroscopy	1	4	4	25	75	100	
15UPHA41	Allied Mathematics – V	1	2	2	25	75	100	
15UPHA42	Allied Mathematics - VI	1	2	2	25	75	100	
15UMTA41	Allied Physics –IV Optics, Spectroscopy and Modern Physics	1	4	3	25	75	100	For B.Sc Maths Students
15UMTAP2	Allied Physics Practical - II	1	2	1	40	60	100	
15UPHCP2	Major Physics Practical - II	1	2	2	40	60	100	
15UBAN41	Entrepreneurship Development	1	2	2	25	75	100	
15UETN41- 15UETN45	Extension Activities	-	0	1	100	--	100	
	TOTAL	9	30	23	--	--	1000	



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)

DEPARTMENT OF PHYSICS

Course Structure - Semester wise CBCS (w.e.f. 2015-2016)

Class : B.Sc (Physics)

Part III : Core

Semester : III

Hours : 04

Subject Code : 15UPHC31

Credits : 04

MEDICAL PHYSICS

Course Outcomes

CO1 To enable the students to understand the basic concepts in medical physics.

CO2 To study the design of medical instruments.

CO3 To understand the working of ECG, scanning (CT, MRI) and medical applications of laser.

Unit – I

Transport of ions through the cell membrane – Bio electric potential – Design of medical instruments – Component of bio-medical instrument system – Electrodes – Electrode potential – Types of electrodes – 1. Micro electrodes –(a) Metal micro electrode,(b) Micropipet –2.(a) Depth electrode, 2.(b) needle electrode. 3. Surface electrodes – (a) Metal plate (b) Suction cup (c) Adhesive tape and (d) Multipoint electrode.

Unit – II

Transducers – Performance of characteristics of transducers – Static and dynamic active transducers – (a) Magnetic induction type (b) Piezo-electric type (c) Photo voltaic type (d) Thermoelectric type – Passive transducers – (a) Resistive type – Loading effect and sensitivity of a bridge (b) Capacitive transducers (c) Linear Variable Differential Transformer(LVDT).

Unit – III

Characteristics of basic recording system – Electro Cardiography (ECG) – Block diagram of E.C.G. Leads – Unipolar and bipolar – ECG recording set up - Electro Encephalograph (EEG) – Origin – Block diagram of EEG unit - Electro Myograph (EMG) – Block diagram of EMG recorders.

Unit – IV

Electron Microscope – Scanning E.M – Digital thermometer - Audiometers –Defibrillators – Internal and external type – A.C, D.C , square wave.

Unit – V

Lasers in medicine – Laser instrumentation – Advantages of laser surgery – Medical applications of laser – Photo thermal applications and photo chemical applications – Computer tomography (CT) principle – Block diagram of CT scanner – Applications of ultrasonic imaging system - Block diagram - Applications of diagnostic ultrasound.

Text Book:

1. M.Arumugam, **Biomedical Instrumentation**, Anuradha Publications, Chennai, Second Edition 1994.
Unit I: Chapter 1 and 2 (Section 1.4,1.6, 2.2,2.3,2.4,2.4.1,2.4.4,2.4.4 to 2.4.7)
Unit II: Chapter 2(Section 2.5,2.5.1,2.5.2,2.5.3,2.5.4,2.5.5,2.5.6,2.5.7,2.5.13,2.2.15)
Unit III: Chapter 4(Section4.2,4.3,4.3.1,4.3.2,4.3.3,4.4,4.4.1,4.4.4,4.5,4.5.1)
Unit IV: Chapter 7and 5(Section7.3,7.6,7.7,5.5,5.5.1)
Unit V: Chapter 10(Section10.3,10.7,10.9,10.9.1,10.9.2,10.9.3,10.9.8)

Reference Books:

1. R.S. Khandpur , **Hand Book of Biomedical Instrumentation**, Tata McGraw-Hill, First Edition, New Delhi, 1999.
2. L. Cromwell, F.J. Welbell, E.J. Pfeiffer, **Biomedical Instrumentations and Measurements**, PHI Ltd, NewDelhi, Second Edition, 2006.
3. **John G. Webster, Editor, Medical Instrumentation Application and Design. John Willey and Sons. INC, Third Edition, Singapore, 1998.**



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class	: B.Sc (Physics)	Part III	: Allied
Semester	: III	Hours	: 04
Subject Code:	15UPHA31	Credits	: 04

ALLIED MATHEMATICS – IV

Course Outcomes

CO1 To develop the skills in formulation of LPP.

CO2 To learn about different techniques on solving LPP.

CO3 To teach Transportation and Assignment problems

Unit – I

Definition – Nature and scope – models – Definitions of a standard programming problems
– Definition of feasible solution – Optimal solution – basic feasible solutions – Degenerate solution of a LPP.

Unit-II

Mathematical Formulation of a LPP – Slack and Surplus variables – Graphical solution of a LPP.

Unit –III

Simplex method of solving a LPP – Charles method of penalties – Concept of Duality-
Formation of Dual LPP – the dual of the dual is the primal (Only Problems).

Unit –IV

Transportation Problem –Finding Initial feasible solution by North West Corner method and Vogel's Approximation method – Optimal solution of Transportation problem.

Unit-V

Assignment problem – Solution of Assignment problems – Travelling sales man problem.

Text Books:

1. Kanti Swarup ,Manmohan and Gupta, **Operations Research** , Sultan Chand Publications, New Delhi, 2006
 - Unit I - From text book 1: Chapter 1
 - Unit II - From text book 1: Chapter 3 : Sections : 3.1 to 3.4
2. Dr.S.Arumugam and Isaac, **Topics in Operations Research** (Linear Programming) New Gamma Publishing House, Palayamkottai, June 2012.
 - Unit III - From text book 2: Chapter 3:Sections: 3.5 to 3.10
 - Unit IV - From text book 2: Chapter 4 : Sections 4.1 and 4.2
 - Unit V - From text book 2: Chapter 5 : Sections 5.1 and 5.

Reference books:

1. R.K. Gupta, **Operations Research**, Krishna Prakash Mandir, Meerut, Second Edition 1987- 1988
2. Kanti Swarup , P.K. Gupta and Man Mohan, **Introduction to Operations Research** , Sultan Chand and sons Publications, New Delhi, August 1997.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS

Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class : B.Sc (Physics)	Part III : Allied
Semester : III	Hours : 04
Sub code : 15UCHA31	Credits : 04

ALLIED CHEMISTRY I - ORGANIC, INORGANIC AND PHYSICAL CHEMISTRY - I

Course Outcomes

CO1 To have the basic idea of gaseous state of chemistry

CO2 To gain the basic knowledge of colloidal chemistry and chemical bonding

CO3 To understand the basic knowledge of organic types of reactions and detection and estimation of nitrogen and halogens

Unit-I

Detection and estimation of Nitrogen and Halogens in organic compounds - Empirical formula, Molecular formula and structural formula definitions only- Calculation of Empirical formula & Molecular formula from percentage composition - Tetrahedral arrangement of the valencies of carbon atom(4 hrs) .

Nucleophiles and Electrophiles– Definition- types and examples. – Specific reactions involving these –carboniumion, carbanions and free radicals – Definition and examples. (4 hrs).

Types of reactions – substitution – addition – elimination – rearrangement and polymerization reactions – Illustration with examples.(4 hrs)

Unit- II

Oxides – classification – examples

Hydrides – classification – examples – ortho and para hydrogen – properties of ortho and para hydrogen Isotopes of hydrogen. (5 hrs)

Hydrogen peroxide – Manufacture, properties structure and uses.(3 hrs)

Water – Hardness of water – types of hardness – removal of hardness – Industrial implications of hardness of water – estimation of hardness by EDTA Method (outline only) – Units of hardness of water (4 hrs)

Unit - III

Gaseous state – Postulates of Kinetic theory of gases – derivation of expression for pressure of an ideal gas on the basis of Kinetic theory –deducing the basic gas laws. (3 hrs)

Deviation of real gases from ideal behaviour – reasons for deviation – derivation of Vanderwall’s equation. (3 hrs)

Average, rootmeansquare and most probable velocities – (equations only) relationship between these different velocities. (3 hrs)

Liquefaction of gases: Modern methods – Joule Thomson effect – Inversion temperature. (3 hrs)

Unit-IV

Colloidal state of matter – various types – classification (2 hrs).

Sols – Dialysis – electro osmosis – electrophoresis – stability of colloids – protective action – Hardy Schulze law – gold number (3 hrs).

Emulsion: types of emulsions – emulsifier with examples (2 hrs).

Gels: classification, preparation (3 hrs).

Applications of colloids (2 hrs).

Unit -V

Bonding – V.B. Theory – Postulates of V.B Theory – Application to the formation of simple molecules like H₂ and O₂ overlap of atomic orbitals – s-s, p-p and s-p overlap – Hybridization of sp, sp² & sp³ – VSEPR theory (7hrs)

M.O theory – formation of Mo’s Bonding, anti bonding and non-bonding Mo’s, M-o diagram of H₂, He₂, N₂, O₂ & F₂ molecules (5 hrs)

Text Book:

K.Rathinamuthu(*), R.Victoria(**), **Ancillary Chemistry**, (*) Head of the Department of Chemistry, Vivekanadha College, Thiruvadakam,(**) Head of the Department of Chemistry, Lady Doak College, Madurai, 2012.

Unit I	: Pg No. 39–76
Unit II	: Pg No. 1–38
Unit III	: Pg No. 78–98
Unit IV	: Pg No. 120-134
Unit . V	: Pg No. 99-119

Reference Books:

1. Bahl and Arun bahl, **Advanced Organic Chemistry**, Sulthan and Chand Company, New Delhi, 19th Edition, 2005.
2. M.K. Jain, **Organic Chemistry**, Sulthan and Chand Company, New Delhi, 12th Edition, 2003.
3. R.D. Madan, J.S. Tiwari and G.L. Mudhara, **A text book of first year B.Sc, Chemistry**, Sulthan and Chand Company, New Delhi, 2002.
4. B.R. Puri and L.R. Sharma, **Principes of Inorganic Chemistry**, Shoban lal, Nagin Chand and Company, New Delhi, 2000.
5. B.R. Puri, L.R. Sharma and S.Patharia, **Principles of Physical Chemistry**, Shoban lal, Nagin Chand and Co, New Delhi, 2001.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class : B.Sc(Physics) Part IV : NME
Semester : III Hours : 02
Subject Code : 15UBAN31 Credit : 02

BUSINESS MANAGEMENT

Course Outcome:

CO1: On successful completion of this syllabi the students will

CO2: Understand the basic of knowledge of business organization through the process of management.

CO3: Understand modern business practices, forms, procedures and functioning of various business organizations

Unit- I :

Business – Concept & Definition, Role of Business in the Modern Indian Economy -
Management – Definition – Nature – of Business Management – Universality of Management
Principle – Planning – Definition, Characteristic, Importance, Advantages and Limitations –
Steps in Planning.

Unit- II :

Organising – Definition – Steps in organising – Importance of Organising – Bases of Organising
– Function, Territory – Customer – Uses of Staff – Delegation of Authority.

Unit- III :

Staffing – Definition – Recruitment – Sources, Selection – Techniques, Training Methods,
Performance Appraisal and its Importance.

Unit- IV :

Directing – Definition – Elements of Direction – Motivation – Meaning and Importance.
Leadership – Meaning, Styles and Importance. Communication – Meaning – Process and
Importance. Barriers in Communication and Ways to Overcome.

Unit- V :

Controlling – Meaning, Steps in Controlling. Qualities of a Good Control System. Benefits of
Controlling.

Text Book:

1. S. PandiSakthiRajan, Principles of Management, Merit India, Madurai.

Reference Books:

1. T.Ramasamy, **Principles of Management**, Himalaya Publishing House, 'Ramdoot'
Dr.BhaleraoMarg, Girgaon, Mumbai – 400 004.
2. T.Jayasankar, **Principles of Management**, Margham Publications, 24, Rameswaram
Road, T.Nagar, Chennai-600 017.
3. P.C.Tripathi and P.N.Reddy, **Principles of Management**, McGraw Hill, New Delhi.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class : B.Sc (Physics)

Part III : Allied

Semester : IV

Hours : 04

Sub code : 15UCHA41

Credits : 03

ALLIED CHEMISTRY – II - ORGANIC AND PHYSICAL CHEMISTRY – I

Course Outcomes

CO1 To enable the students

CO2 To learn the basic idea of amino acids carbohydrates and stereoisomerism.

CO3 To know about the organic metallic compounds and nuclear chemistry

Unit - I

Amino Acids and Proteins, Classification, Synthesis, Properties of amino acids, Poly peptides, Proteins, Classification and biological functions (6 hrs) Dyes – Definition – theory of colour and constitution classification of dyes based on structure and mode of applications – Preparation of Methyl orange – Bismark brown – Malachite green – Vat dye – Indigo.
(6 hrs)

Unit- II

Carbohydrates – Definition – Classification – Mono saccharides – Properties and uses of glucose and fructose – Structure of glucose and fructose - Haworth structure – conformational structure – Conversion of glucose into fructose and vice versa (6 hrs). Disaccharides – Sucrose – manufacture – Properties and uses – Structure – conformational structure (No structural elucidations) Distinction between glucose, fructose and sucrose Poly saccharides – Strach and Cellulose(Structure only) - - amylose - - amylose – difference between these two.(6 hrs)

Unit- III

Organo metallic compounds – Definition – preparation and synthetic applications of Grignard reagent. (4 hrs) Mechanisms of aliphatic substitution Reactions: Mechanism – SN1 and SN2 – Illustration with examples and differences – Saytzeff and Hofmann rules. (3 hrs)

Aliphatic halogen compounds – preparation - properties and uses of ethyliodide, chloroform, Iodoform and carbon tetra chloride.(5 hrs)

Unit -IV

Nuclear chemistry –Composition of Nucleus – Nuclear forces- Mass defect – binding energy – Nuclear stability and binding energy comparison of Alpha, Beta & Gamma rays

– Soddy’s group displacement law – Illustration – law of radioactive disintegration constant- average life period –half life period. (8 hrs) Nuclear Fission: Definition – Principle of atom bomb – Nuclear fusion – Definition – Principle of hydrogen bomb – Comparison of Nuclear Fission and Fusion – Radio active isotopes — radiocarbon dating technique – Applications of radioactivity. (4 hrs).

Unit -V

Stereoisomerism: Chiral center – optical activity of compounds containing one or two chiral centers – R-S notation – diastereoisomers – racemisation – resolution.(6 hrs)

Geometrical isomerism of maleic and fumaric acids – E-Z notation of geometrical isomers.(6hrs)

Text Book:

K.Rathinamuthu(*), R.Victoria(**), Ancillary Chemistry, (*) Head of the Department of Chemistry, Vivekanadha College, Thiruvudakam,(**) Head of the Department of Chemistry, Lady Doak College, Madurai, 2012.

Unit I : Pg No. 113-132

Unit II : Pg No. 31- 60

Unit III : Pg No. 82-92, 102-107

Unit IV : Pg No. 1-28

Unit V : Pg No. 61-80

Reference books:

1. B.S.Bahl and Arun Bahl , A Text book of Organic Chemistry, Sultan Chand and Co Ltd, New Delhi,1996.
2. P.L.Soni, H.M. Chawla , A Text book of Organic Chemistry, Sultan Chand and Sons, New Delhi, 30th Edition, 2001.
3. Jaya Shree , G .Ghosh, Fundamental Concepts of Applied Chemistry, Sultan Chand and Co. Ltd, New Delhi,2008.
4. B.R. Puri, L.R. Sharma and S.Patharia , Principles of Physical Chemistry, Shoban lal Nagin Chand and Co, New Delhi, 2001.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class : B.Sc (Physics)

Part III : Allied

Semester : IV

Hours : 02

Sub code : 15UCHAP1

Credits : 01

ALLIED CHEMISTRY - II - PRACTICAL – I VOLUMETRIC ANALYSIS

Course Outcomes

CO1 To develop skill in Acidimetry and alkalimetry

CO2 To learn about Iodimetry

CO3 To understand permanganometry

1. Estimation of Sodium Hydroxide
(Na_2CO_3 X HCl X NaOH)

2. Estimation of Hydrochloric Acid
($\text{H}_2\text{C}_2\text{O}_4$ X NaOH X HCl)

3. Estimation of Oxalic Acid
(FeSO_4 X KMnO_4 X $\text{H}_2\text{C}_2\text{O}_4$)

4. Estimation of Ferrous Sulphate
($\text{H}_2\text{C}_2\text{O}_4$ X KMnO_4 X FeSO_4)

5. Estimation of FAS
(FeSO_4 x KMnO_4 x FAS)

6. Estimation of KMnO_4
($\text{K}_2\text{Cr}_2\text{O}_7$ X FAS X KMnO_4)

7. Estimation of Sodium Hydroxide
(KMnO_4 X $\text{H}_2\text{C}_2\text{O}_4$ X NaOH)

8. Estimation of $\text{K}_2\text{Cr}_2\text{O}_7$
(KMnO_4 X FAS X $\text{K}_2\text{Cr}_2\text{O}_7$)

9. Estimation of Na_2CO_3
(NaOH X HCl X Na_2CO_3)

10. Estimation of Iodine
(KMnO_4 x Thio x Iodine)



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class : B.Sc(Physics)
Semester : IV
Subject Code : 15UPHC41

Part III : Core
Hours : 04
Credit : 04

OPTICS AND SPECTROSCOPY

Course Outcomes

CO1 To understand the basic concepts in optics.

CO2 To understand the properties of light like reflection, refraction, interference, diffraction and polarization

CO3 To study the infrared spectroscopy, Raman effect, Doppler Effect and fiber optic communication system.

Unit I - Geometrical optics

Equivalent focal length of a system of two thin lenses in contact- Separated by a distance. Aberrations in lenses- Chromatic aberration (longitudinal and lateral) - Achromatic combination (lenses in contact and separated by a distance). Spherical aberration – Minimizing spherical aberration - Separation by a distance.

Unit II - Physical optics – Interference

Coherent sources - Colours of Thin films - Interference by reflected light only - Michelson's interferometer -Applications- Determination of wave length-Resolution of spectral line- Refractive index of glass –Fabry-Perot interferometer-sharpness of fringes -Resolution- Types of interference fringes (Reflection only)-Holography.

Unit III - Diffraction

Zone plate -Theory-Comparison with convex lens – Fresnel and Fraunhofer diffraction in straight edges – Circular aperture - Rectangular aperture- -Concave reflection grating- Eagle mounting only - Resolving power of optical instruments - Telescope, prism, grating.

Unit IV – Polarization

Introduction - Double refraction- Huygens's Theory of Double Refraction in Uniaxial Crystals- Nicol prism- Plane, Circularly and Elliptically Polarized Light –Theory of Production of Elliptically and Circularly Polarized Light - Quarter Wave Plate - Half wave

Plate- Optical activity – Introduction – Biot’s Laws – Fresnel’s Theory of Optial Rotation – Experimental Verification of Fresnel’s Theory – Specific Rotation – Laurent’s Half Shade Polarimeter – Specific Rotation of Sugar Solution.

Unit V - Spectroscopy

Infrared Spectroscopy - Sources – Detection and its Applications –Ultraviolet Spectroscopy - Sources – Detection and its Applications - Raman effect – Experimental study – Quantum theory of Raman effect – Applications - Doppler Effect in light and its applications - Fibre optics – Fibre Construction – Light Propagation in Fibres – Fibre Optic Communication System – Advantages.

Text Book:

1. R.Murugesan, **Thermal Physics and Sound, Optics and Spectroscopy**, Madurai, First Edition, 2007
Unit I: Chapter 1(Section 1.5,1.6, 1.8 – 1.14)
Unit II: Chapter 2(Section 2.1, 2.3, 2.5 – 2.13)
Unit III: Chapter 3(Section 3.1 - 3.7, 3.12 – 3.16)
Unit IV: Chapter 4(Section 4.1, 4.5, 4.6, 4.8 – 4.12 and 4.14 – 4.20)
Unit V: Chapter 5(Section 5.1 - 5.11, 5.13 and 5.14)

Reference Books:

- 1.Kakani and Bhandari Sultan , **Optics and Spectroscopy**, Chand and Sons, New Delhi,2000.
- 2.Brijlal and Subramanyam, **A Text book of Optics**, S.Chand and Co., New Delhi, 2004.
3. B.K.Sharma, Spectroscopy, GOEL Publishing House, Meerut, 2006.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)

DEPARTMENT OF PHYSICS

Course Structure - Semester wise CBCS (w.e.f.2015-2016)

**Class : B.Sc (Physics) Part III : Allied Semester :
IV Hours : 02**

Sub code : 15UPHA41 Credits : 02

ALLIED MATHEMATICS - V

Course Outcomes

CO1 To develop logical skills in the formation of differential equations.

CO2 To introduce different techniques of finding solutions to DE.

CO3 To familiarize the applications

Unit – I

Exact Differential Equation –Second Order Differential Equations. Unit –II Second Order Equation with RHS x^n , e^{ax} , $\sin ax$, $\cos ax$, $e^{ax} \sin ax$, $e^{ax} \cos bx$ etc. Unit –III Laplace Transforms- Solution of Differential Equation using Laplace Transforms.

Unit –IV

Partial Differential Equation– Formation – Solution. Unit – V Growth and Decay –Chemical reaction-Simple electric circuits and Planetary motion.

Text Books:

1. Dr.S.Arumugam, Ancillary Mathematics Volume III, New Gamma publishing House, Palayamkottai, July 2009.

Unit I - Chapter 1 : Section 1.3 & 1.5

Unit II - Chapter 2 : Section 2.1 to 2.3

Unit III - Chapter 3 : Full

Unit IV - Chapter 4 : Section 4.1 to 4.3

Unit V- Chapter 5 : Section 5.2 to 5.6 &5.11

Reference books:

1. S. Narayanan and T.K. Manicavasagam Pillai, Differential Equation and its Application,

S.Viswanathan Printers and Publishers Pvt. Ltd., Chennai, Reprint 2006.

2. P.Durai pandian and Dr. S. UdayaBaskaran, Allied Mathematics Volume II,

S.Chand and Company LTD, New Delhi, Revised edition 2008.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)

DEPARTMENT OF PHYSICS

Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class	: B.Sc (Physics)	Part III	: Allied
Semester	: IV	Hours	: 02
Sub code	: 15UPHA42	Credits	: 02

ALLIED MATHEMATICS –VI

Course Outcomes

CO1 To introduce the concepts of an analytic function.

CO2 To familiarize bilinear transformations.

CO3 To teach various types of Groups through examples.

Unit – I

Analytic Functions -Properties- C-R equations.

Unit –II

Bilinear Transformations -Cross Ratio.

Unit –III

Groups -Abelian Groups-Sub Groups.

Unit –IV

Permutation Groups including theorems.

Unit – V

Cyclic Groups -Homomorphisms-Isomorphisms.

Text Book :

1. Dr.S.Arumugam, Ancillary Mathematics Volume III, New Gamma publishing House- July -2009.

Unit I - Chapter 6 : Full

Unit II - Chapter 7 : Full

Unit III - Chapter 8 : Section 8.1 to 8.3 & 8.5

Unit IV - Chapter 8 : Section 8.4

Unit V - Chapter 8 : Section 8.6,8.10,& 8.11

Reference books:

1. Dr.S.Arumugam, Complex Analysis, Scitech Publication, Chennai, reprint, June 2004.
2. Dr.S.Arumugam and Isaac, Modern Algebra, Scitech Publication, Chennai, Reprint, December 2007.



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class	: B.Sc (Physics)	Part III	: Core
Semester	: III & IV	Hours	: 02
Subject Code	:15UPHCP2	Credits	: 02

MAJOR PHYSICS PRACTICAL – II

Course Outcomes

CO1 To develop experimental knowledge by handling various apparatus

CO2 To know the various components and its important

CO3 To know the circuit connections an functioning of experiments.

Any 14 experiments.

- | | |
|--------------------------------------|--------------------------------------|
| 1. Determination of M and B_H | - Tan C method |
| 2. Determination of B_H | - Axial coil |
| 3. Determination of M | - Axial coil |
| 4. Potentiometer | - Temp. Coefficient of coil |
| 5. Potentiometer | - Comparison of EMF's |
| 6. Table Galvanometer | - Figure of merit |
| 7. Spot Galvanometer | - Figure of merit |
| 8. Spot Galvanometer | - Charge sensitiveness |
| 9. Owen's Bridge | - Determination of L |
| 10. De sauty's Bridge | - C_1/C_2 |
| 11 Spot Galvanometer | - Comparison of EMF's |
| 12. Spot Galvanometer | - Comparison of capacities |
| 13. Refractive Index of the material | - Spectrometer |
| 14. Grating | - N and λ |
| 15. Air Wedge | - Thickness of a wire |
| 16. Newton's Rings | - Radius and wavelength measurements |



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)

DEPARTMENT OF PHYSICS

Course Structure - Semester wise CBCS (w.e.f.2015-2016)

Class : B.Sc(Physics)

Semester : IV

Subject Code: 15UBAN41

Part IV : NME

Hours : 02

Credits : 02

ENTREPRENEURIAL DEVELOPMENT

Course Outcomes

CO1 After the completion of course the learner should be able to Understanding of the sources of opportunities and development of the skills to identify and analyze these opportunities for entrepreneurship.

CO2 Understanding of the industry dynamics of and factors for developing successful innovations and apply this understanding to different sectors.

CO3 Development of a personal skill set for entrepreneurship and specific concepts and tools for combining and managing an organization

Unit- I : Entrepreneur: Meaning and Types - Qualities– Factors Affecting Entrepreneurial Growth – Challenges of Women Entrepreneurs.

Unit- II : Entrepreneurial Development – Meaning, Need, objectives – Entrepreneurial Training – Institution – Skill Development for Entrepreneurs - Identification of Business Opportunities in the context of Tamil Nadu – Industrial Policies

Unit- III : Micro Small and Medium Enterprises – Steps to Start a MSME’s and SSI - Legal Framework – Licenses.

Unit- IV : Project Management – Feasibility and Viability Analysis – Technical – Financial – Market – Appraisal and Evaluation – Project Report Preparation

Unit- V : Role of Promotional Institutions with Special Reference to TIIC, SIDCO, DIC, SIDBI - Credit Facilities from Banks.

Text Book:

1. E.Gordon and K.Natarajan, **Entrepreneurship Development**, Himalaya Publishing House, No: 8/2 Madley Street, Ground Floor, T.Nagar, Chennai – 600 017.

Reference Books:

1. S.S. Kanka, **Entrepreneurial Development**, Sultan Chand and Sons, New Delhi.
2. C.B. Gupta & N.P. Sreenivasan, **Entrepreneurial Development**, Sultan Chand and sons, New Delhi.
Vasantha Desai, **Dynamics of Entrepreneurial Development**, Himalaya ALLIED