MANNAR THIRUMALAI NAICKER COLLEGE

PASUMALAI, MADURAI– 625 004

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

(Re-accredited with 'A' Grade by NAAC)

B.Sc., Chemistry

SYLLABUS AND REGULATIONS

UNDER
CHOICE BASED CREDIT SYSTEM (CBCS)
(For those who joined during 2017-2018 and after)

Qualification for Admission

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

Duration of the Course

The Students shall undergo the prescribed B.Sc (Chemistry) 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 x02=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 x05=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 Examinations).
2. No separate pass minimum for the Internal Examinations.
3. 27 marks out of 75 is the pass minimum for the Summative Examinations.

PROGRAMME SPECIFIC OUTCOMES

PSO1: To develop **s**kill in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

PSO2: To appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.

PSO3: To ability to employ critical thinking and efficient problem-solving skills in the areas of analytical, inorganic, organic, and physical chemistry.

PSO4: To demonstrate proficiency in writing and speaking about chemistry topics in a clear and concise manner to both chemists and non-chemists according to professional standards

MANNAR THIRUMALAI NAICKER COLLEGE(Autonomous)
DEPARTMENT OF B.Sc CHEMISTRY
(For those who joined in 2017 and after)
COURSE PATTERN

Study Component	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem	Total Hours	Total Credit	No. of course	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) 2(0)	4(4) 2(2)	4(4) 2(0)	4(4) 2(2)	5(5) 5(5) 4(4) 3(0) 3(0) 2(0)	5(5) 5(5) 4(4) 3(6) 3(5)	64	59	14	1400
Part-III Core Elective						4(4)	4	4	8	100
Allied Physics	4(4) 2(0)	4(3) 2(1)	4(4) 2(0)	4(3) 2(1)			24	16	6	600
Allied Mathematics			4(4)	4(4)	6(4)	6(4)	20	16	4	400
Part-IV										
Skill Based Subjects	2(2) 2(2)	2(2) 2(2)			2(2)	2(2)	12	12	6	600
Environment studies / value education	2(2)	2(2)					4	4	2	200
Non Major Elective			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**	**44**	**4400**

SEMESTER – I							
Subject Code	**Title of the Paper**	**No. of Courses**	**Hours/ Week**	**Credits**	**Maximum Marks**		
					Int	**Ext**	**Tot**
15UTAG11	Part-I: Tamil இக்காலக்கவிதையும் சிறுகதையும்	1	6	3	25	75	100
15UENG11	English-I: Language Through Literature-1	1	6	3	25	75	100
	Part-III Core Subject						
17UCHC11	Inorganic Chemistry -I	1	4	4	25	75	100
~~17UCHCP~~1	Major Chemistry Practical – I (Inorganic semi micro Qualitative analysis)	-	2	-	-	-	-
	Part-III Allied Subject						
15UMTA11	Allied Physics – I (Mechanics, Properties of matter)	1	4	4	25	75	100
~~15UMTAP1~~	Allied Physics Practical-I		2	-	-	-	-
	Part-IV Skill Subject						
17UCHS11	Sugar Technology	1	2	2	25	75	100
17UCHS12	Perfume Chemistry	1	2	2	25	75	100
	Part-IV Mandatory Subject						
15UEVG11	Environmental Studies	1	2	2	25	75	100
	TOTAL	**7**	**30**	**20**	**175**	**525**	**700**

SEMESTER – II

Subject Code	Title of the Paper	No. of Courses	Hours/ Week	Credits	Maximum Marks		
					Int	Ext	Total
15UTAG21	Part II :Tamil இடைக்கால இலக்கியமும் புதினமும்	1	6	3	25	75	100
15UENG21	English-II: Language Through Literature-II	1	6	3	25	75	100
	Part-III Core Subject						
17UCHC21	Organic Chemistry-I	1	4	4	25	75	100
17UCHCP1	Major Chemistry Practical – I (Inorganic semi micro Qualitative analysis)	1	2	2	40	60	100
	Part-III Allied Subject						
15UMTA21	Allied Physics –II (Thermal Physics and Sound)	1	4	3	25	75	100
15UMTAP1	Allied Physics Practical – I	1	2	1	40	60	100
	Part-IV Skill Subject						
17UCHS21	Leather Technology	1	2	2	25	75	100
17UCHS22	Paper and Pulp Technology	1	2	2	25	75	100
15UVLG21	**Part –IV Mandatory Subject** Value Education	1	2	2	25	75	100
	Total	**9**	**30**	**22**	**255**	**645**	**900**

SEMESTER –III

Subject Code	Title of the Paper	No. of Courses	Hours/ Week	Credits	Maximum Marks		
					Int	Ext	Total
15UTAG31	Tamil –III: காப்பிய இலக்கியமும் நாடகமும்	1	6	3	25	75	100
15UENG31	Part –II English Subject English-III: Language Through Literature-III	1	6	3	25	75	100
	Part-III Core Subject						
17UCHC31	Physical Chemistry-I	1	4	4	25	75	100
~~17UCHCP2~~	Major Chemistry Practical – II (Volumetric Analysis)	-	2	-	-	-	-
	Part-III Allied Subject						
17UCHA31	Allied Mathematics-I	1	4	4	25	75	100
15UMTA31	Allied Physics – III (Electricity and Electronics)	1	4	4	25	75	100
~~15UMTAP2~~	Allied Physics Practical – II	-	2	0	-	-	-
	Part-IV Non Major Elective						
17UFDN31	Nutrition for Health and Fitness	1	2	2	25	75	100
	Total	**6**	**30**	**20**	**150**	**450**	**600**

SEMESTER IV

Subject Code	Title of the Paper	No. of Courses	Hours /Week	Credits	Maximum Marks		
					Int	Ext	Total
15UTAG41	**Part –I Tamil** சங்க இலக்கியமும் உரைநடையும்	1	6	3	25	75	100
15UENG41	**Part –II English Subject** English-IV: Language Through Literature-IV	1	6	3	25	75	100
	Part-III Core Subject						
17UCHC41	Inorganic Chemistry - II	1	4	4	25	75	100
17UCHCP2	Major Chemistry Practical – II (Volumetric Analysis)	1	2	2	40	60	100
	Part-III Allied Subject						
17UCHA41	Allied Mathematics – II	1	4	4	25	75	100
15UMTA41	Allied Physics - IV (Optics, Spectroscopy and Modern Physics)	1	4	3	25	75	100
15UMTAP2	Allied Physics Practical -II	1	2	1	40	60	100
	Part IV -Non Major Elective						
17UFDN41	Food Preservation and Safety	1	2	2	25	75	100
15UEAG40 - 15UEAG49	**Part V- Extension Activities**	1	0	1	100	-	100
	Total	**9**	**30**	**23**	**355**	**645**	**900**

SEMESTER – V							
Subject Code	**Title of the Paper**	**No. of Courses**	**Hours /Week**	**Credits**	**Maximum Marks**		
					Int	**Ext**	**Total**
	Part-III Core Subject						
17UCHC51	Organic Chemistry-II	1	5	5	25	75	100
17UCHC52	Inorganic and Analytical Chemistry	1	5	5	25	75	100
17UCHC53	Physical Chemistry-II	1	4	4	25	75	100
17UCHCP3	Major Chemistry Practical-III (Physical Chemistry experiments)		3	0			
17UCHCP4	Major Chemistry Practical-IV (Gravimetric Analysis and Organic Preparation)		3	0			
17UCHCP5	Major Chemistry Practical-V (Organic Analysis and Estimation)		2	0			
	Part-III Allied Subject						
17UCHA51	Allied Mathematics – III	1	6	4	25	75	100
	Part-IV Skill Subject						
17UCHS51	Drug Chemistry	1	2	2	25	75	100
	Total	**5**	**30**	**20**	**125**	**375**	**500**

SEMESTER – VI							
Subject Code	**Title of the Paper**	**No. of Courses**	**Hours /Week**	**Credits**	**Maximum Marks**		
					Int	**Ext**	**Total**
	Part-III Core Subject						
17UCHC61	Organic Chemistry-III	1	5	5	25	75	100
17UCHC62	Physical Chemistry-III	1	5	5	25	75	100
17UCHC63	Industrial Chemistry	1	4	4	25	75	100
17UCHCP3	Major Chemistry Practical-III (Physical Chemistry experiments)	1	3	6	40	60	100
17UCHCP4	Major Chemistry Practical-IV (Gravimetric Analysis and	1	3	5	40	60	100
17UCHCP5	Organic Preparation) Major Chemistry Practical-V (Organic Analysis and Estimation)	1	4	4	40	60	100
	Part-III Allied Subject						
17UCHA61	Allied Mathematics – IV	1	6	4	25	75	100
	Part-IV Skill Subject						
17UCHS61	Polymer Chemistry	1	2	2	25	75	100

மன்னர் திருமலைநாயக்கர் கல்லூரி (தன்னாட்சி)
DEPARTMENT OF CHEMISTRY
Course Structure – Semester wise CBCS (w.e.f. 2015 – 2016)

வகுப்பு	: B.Sc (Chemistry)	பகுதி I	: தமிழ்
பருவம்	: மூன்றாம்பருவம்	நேரம்	: 06
பாடக்குறியீட்டுஎண்	: 15UTAG31	மதிப்பீடு	: 03

காப்பிய இலக்கியமும் நாடகமும்

கூறு:1 காப்பிய இலக்கியம்

சிலப்பதிகாரம் - வழக்குரை காதை
மணிமேகலை - பாத்திரம் பெற்றகாதை
சீவகசிந்தாமணி - விமலையார் இலம்பகம்
(26பாடல்கள்)

கூறு:2

கம்பராமாயணம் - அங்கதன் தூது படலம்
பெரியபுராணம் - திருநீலநக்கநாயனார் புராணம் - முதல் 38பாடல்கள்
சீறாப்புராணம் - மானுக்குப் பிணைநின்ற படலம்.
இயேசுகாவியம் - 1. விபசாரத்தில் பிடிபட்ட பெண்
2. பணக்கார வாலிபன்
3. ஊசியின் காதில் ஒட்டகம் நுழைவது எளிது

கூறு:3நாடகம் - இலக்கிய நாடகங்கள் - ஜெயந்திநாகராஜன்

கூறு:4 இலக்கணம்

பா வகைகள்

1.வெண்பா
2.ஆசிரியப்பா
3.கலிப்பா
4.வஞ்சிப்பா

அணிகள்

1.உவமைஅணி
2.உருவகஅணி
3.பிறிதுமொழிதல் அணி
4.தற்குறிப்பேற்றணி
5.வஞ்சப்புகழ்ச்சிஅணி
6.சிலேடைஅணி
7.வேற்றுமைஅணி
8.உயர்வுநவிற்சிஅணி

கூறு:5 இலக்கிய வரலாறும் படைப்பாற்றலும்

அ. ஐம்பெருங்காப்பியங்கள்,
இஸ்லாம்,கிறித்தவர்களின் தமிழ்த் தொண்டு,
நாடக இலக்கியவரலாறு

ஆ. கடிதம் வரைதல்
பாராட்டுக்கடிதம்,புகார்க்கடிதம்,விண்ணப்பக்கடிதம்

பாட நூல்கள்:

1. சிலப்பதிகாரம், மணிமேகலை,சீவகசிந்தாமணி,கம்பராமாயணம்,பெரியபுராணம், இயேசுகாவியம்,சீறாப்புராணம் **(கூறு 1,2)**
2. இலக்கியநாடகங்கள் – ஜெயந்திநாகராஜன்
தாமரைபப்ளிகேஷன்ஸ் (பி) லிட்
41டீ,சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்
அம்பத்தூர்,சென்னை – 600098 **(கூறு 3)**

3. **நற்றமிழ் இலக்கணம் (கூறு 4)**
-டாக்டர் சொ. பரமசிவம், எம். ஏ. எம்.லிட்., பி.எச்.டி,
பட்டுப் பதிப்பகம், 1269, 32-ம் தெரு,
'ஐ'பிரிவு,அண்ணாநகர் மேற்கு,
கம்பர் குடியிருப்பு,
சென்னை – 600 040
முதற்பதிப்பு – 1966
13-ம் பதிப்பு – 2013

4.தமிழ் இலக்கிய வரலாறு (கூறு 5)

மு. வரதராசன்,
சாகித்திய அகாதெமி,
இரவீந்திரபவன், 35,பெரோஸ்கோ சாலை,
புதுதில்லி, – 110001
முதற்பதிப்பு – 1972
இருபத்தி மூன்றாம் பதிப்பு : 2007

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

Class	**: B.Sc (Chemistry)**	**Part II**	**: English**
Semester	**: III**	**Hours**	**: 06**
Sub Code	**: 15UENG31**	**Credits**	**: 03**

LANGUAGE THROUGH LITERATURE - III

Unit - I Prose Passage

Jawaharlal Nehru- A Glory Has Departed

John Holt – Discipline is a Great Teacher

Unit - II Poetry Passage

Nissim Ezekiel - Night of the Scorpion

A.K.Ramamujan – A River

Unit – III Drama

Arthur Miller – The Death of a Salesman

Unit - IV Vocabulary-II

One word substitution

Spotting the error

Idioms and Phrases/ Phrasal verbs

Unit - V Composition

Drafting Advertisements.

Developing the hints.

Text Books:

1. G. RadhakrishnaPillai, **English for Success**, Emerald Publication,Chennai,2012.
2. Lewis, Norman, **Word Power Made Easy**, Pocket Books, New York,1978.
3. C.N.Srinath,**Indian Verse in English**, Macmillan Publishers Indian Ltd,2003.
4. A.Shanmugakani, **Prose for Communication**, Manimekala Publishing house, 2008.

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DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Programme	**: B.Sc (Chemistry)**	**Part III**	**: Core**
Semester	**: III**	**Hours**	**: 04**
Subject Code	**: 17UCHC31**	**Credits**	**: 04**

PHYSICAL CHEMISTRY-I

CourseOutcomes:

CO1: To study the essentials of gaseous state and colloidal state of matter
CO2: To have the basic idea of chemical kinetics
CO3: To know about the adsorption & catalysis
CO4: To study the kinetics of chemical equation in various fields.

Unit -1: Gaseous State

a. Postulates of kinetic theory gases – Derivation of ideal gas laws from the expression on the basis of kinetic theory of gases – Deviations – Vander Wall's equation – Reduced equation of state – Law of corresponding states compressibility factor for gases – Boyle and inversion temperatures of gases.

b. Maxwell – Boltzmann law of distribution of velocities (Derivation not necessary) graphical representation – Effect of temperature on various velocities – Experimental verification of Maxwell's law.

c. Mean free path – Viscosity of gases – Collision number – Brownian movement and determination of Avogadro number – Loschmidt number – Principle of equipartition of energy.

Unit -2: Colloidal State

a. Colloidal State of matter – Various types – Classification
b. Sols – Dialysis – Electro osmosis – Electrophoresis – Stability of colloids – Protective action – Hardy – Schulze law - Gold number
c. Emulsion – Types of emulsions – Emulsifier with examples
d. Gels – Classification – Preparation and applications of colloids

Unit -3: Adsorption

Adsorption: Definition of various terms – Adsorption of gases on solids characteristics of adsorption of gases on solids – Physisorption and chemisorption– Factors influencing adsorption – adsorption isotherm – BET (Elementary idea only) – Applications of adsorption

Unit-4: Catalysis

Catalysis: Definition – Characteristics – Theories of catalysis – Promoters - Poisons – Enzyme Catalysis – Mechanism – Michaleis Menten equation - acid base catalysis - Autocatalysis – Application of catalysis.

Unit -5: Chemical Kinetics

a. Introduction – Rate of reaction – Rate law and Rate constant – Order and molecualrity of a reaction. Reaction of first and pseudo unimolecular reaction Catalytic decomposition of hydrogen peroxide – Decomposition of dinitrogen pentoxide. Inversion of cane sugar and hydrolysis of ester by acid.
b. Second, third and Zero order reactions – examples – rate equation – half period (no derivation required)
c. Influence of temperature on the rate of reaction – Arrhenius rate equation and its significance – Measurement of parameters. Theory of reaction rates - Bimolecular collision theory – Unimolecular reactions – Lindemann hypothesis – Absolute Reaction Rate theory.
d. Influence of ionic strength on reaction rate – primary and secondary salt effect – kinetics of fast reactions – Relaxation method.

Text Books

1. Arun Bahl, B.S Bahl & G.D. Tuli, Essentials of Physical Chemistry, S.Chand and Co, New Delhi, 2014.

Unit- 1: Page No's – 387-456

Unit -2: Page No's – 890-928

Unit-3: Page No's – 928-945

Unit -4: Page No's – 863-890

Unit -5: Page No's - 808-863

Reference Books

1. Gilbert. W. Castellan, Physical Chemistry, Narosa publishing house, third edition 1985.
2. P.W. Atkins, Physical Chemistry, 7th edition, Oxford university press, 2001.
3. S.K. Dogra and S. Dogra, Physical Chemistry Through Problems, New age international, 4th edition 1996.
4. B.R. Puri, L.R. Sharma and S.Pathania, Principles of Physical Chemistry, Shoban Lal Nagin chand and Co, 47th edition, 2017.
5. S.H. Maron and J.B. Lando, Fundamentals of Physical Chemistry, Macmillan limited, New York, 1966.

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DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Programme	**: B.Sc (Chemistry)**	**Part III**	**: Core**
Semester	**: IV**	**Hours**	**: 02**
Subject Code	**: 17UCHCP2**	**Credits**	**: -**

Major Chemistry Practical –II
Volumetric Analysis (Practical)

(A double titration involving the making up of the solution to be estimated and the preparation of a primary standard.)

CourseOutcomes:

CO1: To develop skill in Acidimetric and alkalimetric analysis
CO2: To gain knowledge in redox, iodometry and dichrometry
CO3: To study about the argentimetry and EDTA titration
CO4: To determine the percentage of substance in Industry through volumetric analysis.

List of Experiments

I. Acidimetry and Alkalimetry

1. Estimation of Na_2CO_3
2. Estimation of NaOH / KOH
3. Estimation of oxalic acid.

II. Redox Titrations

a. Permanganometry

1. Estimation of ferrous ion
2. Estimation of oxalic acid
3. Estimation of calcium (direct method)

b. Dichrometry

1. Estimation of ferrous ion
2. Estimation of ferric ion using external indicator

III. Iodometry and Iodimetry

1. Estimation of potassium dichromate
2. Estimation of potassium permanganate
3. Estimation of copper

IV. Argentimetry

Estimation of Potassium Chloride

V. EDTA Titration

Estimation of Hardness of water using EDTA.

Distribution of Marks (Max.marks -100)

Duration of examinations: 3hrs

Int: 40

Class work	: 30 marks
Observation note book	: 10 marks
Total	: 40 marks

Ext: 60

Viva Voce	: 5 marks
Record Notebook	: 10 marks
Procedure writing	: 15 marks
Volumetric estimation	: 30 marks
TOTAL	: 60 marks

For Volumetric Estimation if the student have

Less than 2% Error	-	30 marks
2-3% Error	-	25 marks
3-4% Error	-	20 marks
3-5% Error	-	15 marks
Greater than 5%	-	10 marks

Text Book:

1. Vogel, Text book of Inorganic quantitative analysis, Longman Sc & Tech, 2008.

Reference Books:

1. Jeyavathana Samuel, Chemistry Practical Book, G.G.Printers, Chennai, 2012.

2. Vickie.M.Williamson, M.Larry Peck, Lab manual for General Chemistry, Cengage Learning India Private Limited, New Delhi, 2009.

3. Dr. V. V. Ramanujam, Inorganic Semimicro Qualitative Analysis, National Publishing Company, Chennai, 3rd edition, 1974.

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DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class	**: B.Sc(Chemistry)**	**Part III**	**: Allied**
Semester	**: III**	**Hours**	**: 04**
Sub code	**: 17UCHA31**	**Credits**	**: 04**

ALLIED MATHEMATICS - I

CourseOutcomes:

CO1 To familiarize with the theory of equations.
CO2 To introduce transformation of equations.
CO3 To teach trigonometric expressions.
CO4 Toprovides the capability of solving the problems on skill development

Unit - I Theory of Equation – An n^{th} degree equation has exactly n roots-Relation between the rootsand the coefficients.

Unit - II Reciprocal Equations- Transformation of Equations .

Unit -III Finding the roots upto two decimals by Newton's method and Horner's Method

Unit - IV Radius of curvature, Center of curvature of plane curves.

Unit - V Trigonometry – Expression For sinnθ, cosnθ and tannθ.

Text Book:

1) S.Arumugam, **Ancillary Mathematics Volume I**, New Gamma Publication, 1999 Reprint, Palayamkottai, 2006.

Unit I - Chapter 1: Page No 1 to 26
Unit II - Chapter 1: Page No 27 to 40
Unit III – Chapter 1: Page No 40 to 48
Unit IV - Chapter 3: Page No 65 to 90
Unit V - Chapter 4: Page No 143-153

Reference Books :

1. T.K .Manickavashagam Pillai and S.Narayanan**, Algebra,Volume I and II,** S.ViswanthanPrinters and Publishers Pvt Ltd, Chennai, 2009.
2. T.KManickavashagampillai and S.Narayanan**, Trigonometry,** S.ViswanthanPrinters and Publishers Pvt Ltd, Chennai, 2009.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class	**: B.Sc(Chemistry)**	**Part III**	**: Allied**
Semester	**: III**	**Hours**	**: 04**
Subject Code	**:15UMTA31**	**Credits**	**: 04**

ALLIED PHYSICS – III

ELECTRICITY AND ELECTRONICS

CourseOutcomes:

CO1: To enable the students to understand the basic concepts of electricity and electronics.

CO2: To understand the Gauss's law, Kirchhoff's laws and torque.

CO3: To study diodes and Binary number system.

CO4: To develop the skill in the field of electricity and electronics.

Unit I:

Gaus's law – Proof – Applications – Electric field due to a charged sphere – Field near a charged conducting cylinder - Coloumb's theorem – Electric potential – Relation between electric potential and electric field – Capacitors –Expression for C of a parallel plate, spherical (outer sphere earthed) and cylindrical capacitors – Energy of a charged capacitor – Loss of energy on sharing of charges between two capacitors.

Unit II:

Kirchoff's laws – Application of Kirchhoff's laws to Wheatstone's network – Carey Foster's Bridge – Measurement of resistance and temperature coefficient of resistance – Principle of Potentiometer – Calibration of ammeter and voltmeter(low & high range) – Measurement of resistance using potentiometer.

Unit III:

Torque on a current loop – Mirror galvanometer, dead beat and ballistic galvanometers – current and voltage sensitiveness using B.G – Experiments for charge sensitiveness – comparison of emf's and comparison of capacitors.

Electro motive force generated in a coil rotating in a uniform magnetic field – RMS and Mean values – LCR circuit -Series and parallel resonant circuits.

Unit IV:

Junction Diodes – forward and reverse bias – Diode characteristics – Types of diodes (LED and Zener)-Bridge rectifier using Pi filter – Transistor – Characteristics(CE mode only) – Single transistor(CE) amplifier – Frequency response - Hartley oscillator – OPAMP and its characteristics – OPAMP as adder and subtractor.

Unit V:

Binary number system – Reason for using binary numbers – Binary to decimal and decimal to binary conversions – Addition and subtraction of binary numbers – Logic circuits – Boolean algebra – De Morgan's theorem – OR, AND, NOT, NOR and NAND gates –EX-OR gates.

Text Book:

1. R. Murugesan **,Electricity and Electronics**, S.Chand and Co, New Delhi, First Edition, June 2012.

   Unit – I : 1.1 – 1.19
   Unit – II : 2.1 – 2.10
   Unit – III : 3.1 – 3.10, 3.11 – 3.16
   Unit – IV : 4.1 – 4.18, 4.24, 4.25
   Unit – V : 5.1 – 5.18

Reference Books:

1. Narayanamoorthy and Nagarathinam , **Electricity and Magnetism,** National Publishing Co, 1997
2. Sehgal, Chopra and Sehgal, **Electricity and Magnetism**,- Sultan Chand and Sons, New Delhi, 1998
3. R. Murugesan, **Electricity and Electromagnetism**, S.Chand and Co, New Delhi, 2004.
4. Brijlal and Subramaniyam, **Electricity & Magnetism**, , S.Chand and Co, 20th revised edition, 2007.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class	**: B.Sc(Chemistry)**	**Part III**	**:Allied**
Semester	**:III & IV**	**Hours**	**:02**
Subject Code	**:15UMTAP2**	**Credits**	**:-**

ALLIED PHYSICS PRACTICAL – II

CourseOutcomes:

CO1: To understand the thickness of wire using Air wedge method, radius of curvature by Newton's rings
CO2: To analyse the spectrum with the help of a prism and grating
CO3: To enable the students to know about Bridge rectifier, Transistor characteristics
CO4: To develop the skill to mensure the physics experimental values.

Any 14 experiments.

1. Mirror Galvanometer - Voltage and current sensitiveness
2. LCR – Series resonance - Determination of L & Q factor
3. Air wedge - Thickness of a wire
4. Dispersive power of a prism - Spectrometer
5. Grating N by λ Normal incidence - Spectrometer
6. Newton's rings - Determination of radius of curvature
7. Bridge rectifier - Pi filter
8. Transistor characteristics - CE mode
9. Single stage transistor amplifier
10. Hartley oscillator
11. Logic gates – AND, OR, NOT - Truth table verification
    Using Discrete Components.
12. Logic gates – NAND, NOR - Truth table verification
    Using Discrete Components.
13. Zener diode characteristics and break down voltage
14. OP AMP as an adder and subtractor
15. Comparison of capacitances - Desauty's method using headphone
16. LCR – Parallel resonance.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class	**: B.Sc (Chemistry)**	**Part IV**	**: NME**
Semester	**: III**	**Hours**	**: 02**
Subject Code	**: 17UFDN31**	**Credits**	**: 02**

NUTRITION FOR HEALTH AND FITNESS

CourseOutcomes:

CO 1: To understand the role of food and nutrients.
CO 2: To apply knowledge in the maintenance of health and disease processes.
CO 3: To provide theoretical enlightenment about fitness for life.
CO4: To develop skill in the aea of Nutrition for Health and Fitness.

Unit-1

Introduction to Human Nutrition: Definition, History, Resent Developments, Role of Nutrition in Maintaining Health, Classification of Nutrients.

Unit -2

Nutrients - Classification, Macro nutrients - Carbohydrate, Protein and Fat - Functions, Deficiency, Sources.

Unit -3

Micro nutrients - Vitamins and Minerals - Functions, Deficiency, Sources.

Unit-4

Therapeutic Diets for Different Diseases: Obesity, Diabetes Mellitus, Cardiovascular Diseases, Kidney Diseases and Cancer - Symptoms (Clinical findings), Dietary Guidelines.

Unit -5

Fitness - Meaning, Components, types of exercises - aerobic and anaerobic, Energy expenditure for fitness, BMI, RDA.

Reference Books:

1. B. Srilakshmi, Human Nutrition (For B.Sc Nursing Students)New Age International Publishers, New Delhi.

மன்னர் திருமலை நாயக்கர் கல்லூரி (தன்னாட்சி)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

வகுப்பு	:B.Sc (Chemistry)	பகுதி I	: தமிழ்
பருவம்	: நான்காம்பருவம்	நேரம்	: 06
பாடக்குறியீட்டுஎண்	: 15UTAG41	மதிப்பீடு	: 03

சங்க இலக்கியமும் உரைநடையும்

Course Outcomes:

CO1 2000 ஆண்டுகளுக்கு முனபு எழுதப்பட்ட பாடல்கள் உலகின் சில மொழிகளுக்கிடையே மட்டுமே காணக்கிடைக்கின்றன. அந்த வகையில் தமிழ் மொழியிலுள்ள சங்க இலக்கியங்கள் காலத்தால் பழமையானவை.

CO2 தமிழர்களின் கருத்து வளத்தையும் மொழி பழமையையும் பண்பாட்டுச் சிறப்பினையும் அறிந்து கொள்ள ஏதுவாக சங்க இலக்கிய நூல் அனைத்தும் பாடமாக வைக்கப்பட்டுள்ளது.

CO3 2000 ஆண்டுகளுக்கு முற்பட்ட மொழியை, இனத்தை, நாட்டை உணரும் வகையில் கட்டுரைகள் பாடத்திட்டத்தில் இடம் பெற்றுள்ளன.

CO4: மாணவர்களின் மொழி ஆளுமை திறன் வளர்ப்பதற்கு இந்தப்பாடம் கற்பிக்கப்படுகிறது.

கூறு:1 சங்க இலக்கியம்

பத்துப்பாட்டு – முல்லைப்பாட்டுமுழுவதும்

நற்றிணை – பாடல் எண் : 69,77,80,87,110

குறுந்தொகை – பாடல் எண் : 21,28,40,75,102

ஐங்குறுநூறு – பாடல் எண் : 301 முதல் 310 வரை

கலித்தொகை – பாடல் எண் : 2, 8

அகநானூறு – பாடல் எண் : 165, 196, 204

கூறு:2 சங்க இலக்கியம்

பதிற்றுப்பத்து –ஐந்தாம் பத்து –பாடல் எண் 45 வென்றிச் சிறப்பு

பரிபாடல் – ஏழாம் பாடல் – வையை – முதல் 50 வரிகள்

புறநானூறு – பாடல் எண் : 18,112, 191,192,208,

திருக்குறள் – வாய்மை, கள்ளுணண்ணாமை,

நாலடியார் – பிறன்மனை நயவாமை பாடல் எண், 81, 82, 83, 84, 87

கூறு:3 உரைநடை

1.தமிழகமுத்துக்கள்

2. மதுரைமாநகரம்

3. சங்ககாலத்துஅங்கதம்

4. நன்மையும்உண்மையும்

5. தமிழ் இலக்கியங்களில் இதிகாசக் கருத்துக்கள்
6. பேராண்மை
7. விருந்து மற்றும் ஐம்பால்

கூறு:4 இலக்கணம்

1. அகத்திணை வகைகள்
2. புறத்திணை வகைகள்

கூறு:5 இலக்கியவரலாறு

பத்துப்பாட்டு
எட்டுத்தொகை
பதினெண்கீழ்க் கணக்கு

பாட நூல்கள்:

1. பத்துப்பாட்டு, எட்டுத்தொகை **(கூறு1, 2)**
2. நம்.சீனிவாசன்,**கட்டுரைத் தொகுப்பு,** தமிழ்த்துறை மன்னர் திருமலைநாயக்கர் கல்லூரி வெளியீடு, மதுரை – 625004, 2015 **(கூறு 3)**

3. **நற்றமிழ் இலக்கணம் (கூறு 4)**
-டாக்டர் சொ. பரமசிவம்,எம். ஏ. எம்.லிட்., பி.எச்.டி,
பட்டுப் பதிப்பகம், 1269, 32-ம் தெரு,
'ஐ'பிரிவு, அண்ணாநகர் மேற்கு,
கம்பர் குடியிருப்பு, சென்னை –600 040
முதற்பதிப்பு –1966
13-ம் பதிப்பு –2013

4.**தமிழ் இலக்கியவரலாறு (கூறு 5)**
மு. வரதராசன்,
சாகித்திய அகாதெமி,
இரவீந்திரபவன், 35,பெரோஸ்கோ சாலை,
புதுதில்லி – 110001
முதற்பதிப்பு – 1972
இருபத்தி மூன்றாம் பதிப்பு : 2007

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class	**: B.Sc (Chemistry)**	**Part II**	**: English**
Semester	**: IV**	**Hours**	**: 06**
Sub Code	**: 15UENG41**	**Credits**	**: 03**

LANGUAGE THROUGH LITERATURE-IV

CourseOutcomes:

CO1: To enable students to get acquainted with novels.

CO2: To enable students to gain proficiency in the use of English Language by relating prose texts.

CO3: To develop their spoken writing skills through public speaker, Letter writing, group discussions, etc.,

CO4: To enable the learners to create communication skill of the English language through literature.

Unit - I Fiction:

Rabindranath Tagore - The Wreck
Charlotte Bronte – Jane Eyre

Unit - II Word Power

Martin Luther King – I have a dream
A letter from Abraham Lincoln to His son's Teachers

Unit - III Composition:

Letter Writing
Job Application (Resume) Hard and Soft.
Paragraph Writing

Unit - IV Public Speaking:

Welcome Address
Presidential address
Vote of Thanks

Unit - V Art of communication

Group Discussion
Interview

Text Books:

1. R.K. Narayan, **The English Teacher**,Indain Thought Publications, New Delhi,2007 .
2. G. RadhakrishnaPillai, **English for Success**,Emerald Publication,Chennai,2012.
3. Dr.S.Kanitha**, English for Employability**,New Century Book House Pvt,Ltd.,Chennai 2011.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Programme	**: B.Sc (Chemistry)**	**Part III**	**: Core**
Semester	**: IV**	**Hours**	**: 04**
Subject Code	**: 17UCHC41**	**Credits**	**: 04**

INORGANIC CHEMISTRY-II

Course Outcomes:

CO1: To gain the basic knowledge of metallurgy.
CO2: To understand the essentials of co-ordination compounds.
CO3: To learn about the general discussion of p-block elements.
CO4: Metallurgy unit is applicable to go Industry for students.

Unit - 1 - Metallurgy

Occurrence of metals – minerals – ores - types of ores – various steps involved in metallurgy-concentration of ore : physical and chemical methods - calcination - roasting -reduction methods - smelting, alumino-thermic, air and electrolytic methods - refining methods : cupellation, electrolytic, zone refining and vapour phase method - Extraction of Vanadium, Molybdenum and Tungsten from their ore.

Unit – 2 - p - Block Elements – I (Group III A, IV A & V A elements)

General characteristics : Electronicconfiguration, metallic character, oxidation states, - allotropy, oxidation states and catenation Preparation, properties ,structure and uses of Diborane, Borazine-allotropes of carbon – detailed study of Carbides and Silicates – Preparation, properties and uses of Silicones, Carborundum, Stannous chloride, Red Lead and White Lead.- Nitrides: classification - preparation, properties and uses of microcosmic salt, Graham's salt and tartar emetic.

Unit – 3- p - Block Elements – II (Group VI A &VII A elements)

General characteristics : Electronic configuration, metallic and non-metallic character, atomicity, polymorphism, catenation and oxidation states – Anomalous behavior of oxygen - preparation, properties and uses of Caro's acid and Marshall's acid — isolation of fluorine by modern method bleaching powder : its manufacture (Modern method) and estimation of available chlorine in bleaching powder – relative strengths of oxoacids of the halogens - electropositive character of Iodine – Interhalogens & Pseudohalogens

Unit –4 - Coordination Chemistry – I

Double salts and coordination compounds – terminology: coordination sphere, coordination number, ligand and its types – nomenclature - Isomerism: structural isomerism and stereo isomerism - stability: thermodynamic and kinetic stability - factors affecting the stability of metal

complexes – Experimental determination of composition of complexes by Job's method – Chelates:classification – chelate effect and application of the formation of chelated complexes in analytical chemistry.

Unit – 5 - Coordination Chemistry – II

Werner's coordination theory: postulates and experiment evidence - Sidgwick's concept: EAN rule – applications and limitations - Valence Bond Theory: assumptions and illustration to 4 and 6-coordination ions - hybridization and geometry - limitations - Crystal Field Theory: salient features - orbital splitting as applied to octahedral, tetrahedral and square planar complexes - CFSE and its calculation - spectrochemical series- magnetic moments and colour of transition metal complexes.

Text Books

1. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Shoban Lal Nagin Chand and Co., Delhi, 2014.

   Unit- 1: Page No's – 328 - 339.

   Unit -2: Page No's – 416 – 418, 432 – 434, 437-438, 443, 443, 452-455, 468-470,480-482, 486-487, 521-522, .

   Unit-3: Page No's – 536-538, 540-541, 559-560. 570-571, 585-586, 589-590, 591-603.

Unit -4: Page No's – 743-772.

Unit -5: Page No's – 773-786.

Reference Books

1. J. E. Huheey, E. A. Kieter and R. L. Keiter, Inorganic Chemistry, 4th ed., Harper Collins, New York, 1993.

2. F. A. Cotton, G. Wilkinson, C. Murillo and M. Bochman, Advanced Inorganic Chemistry,6th ed., John Wiley, New York, 1999.

3. T. Moeller, Inorganic Chemistry: A Modern Introduction, Wiley, New York, 1990.

4. R.D Madan S.Chand, **Modern Inorganic Chemistry** band Co.Ltd, New Delhi 2012.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Programme	**: B.Sc (Chemistry)**	**Part III**	**: Core**
Semester	**: IV**	**Hours**	**: 02**
Subject Code	**: 17UCHCP2**	**Credits**	**: 02**

Major Chemistry Practical –II
Volumetric Analysis (Practical)

(A double titration involving the making up of the solution to be estimated and the preparation of a primary standard.)

CourseOutcomes:

CO1: To develop skill in Acidimetric and alkalimetric analysis
CO2: To gain knowledge in redox, iodometry and dichrometry
CO3: To study about the argentimetry and EDTA titration
CO4: To determine the percentage of substance in Industry through Volumetric analysis.

List of Experiments

I. Acidimetry and Alkalimetry

1. Estimation of Na_2CO_3
2. Estimation of NaOH / KOH
3. Estimation of oxalic acid.

II. Redox Titrations

a. Permanganometry

1. Estimation of ferrous ion
2. Estimation of oxalic acid
3. Estimation of calcium (direct method)

b. Dichrometry

1. Estimation of ferrous ion
2. Estimation of ferric ion using external indicator

III. Iodometry and Iodimetry

1. Estimation of potassium dichromate
2. Estimation of potassium permanganate
3. Estimation of copper

IV. Argentimetry

Estimation of Potassium Chloride

V. EDTA Titration

Estimation of Hardness of water using EDTA.

Distribution of Marks (Max.marks -100)

Duration of examinations: 3hrs

Int: 40

Class work	: 30 marks
Observation note book	: 10 marks
Total	: 40 marks

Ext: 60

Viva Voce	: 5 marks
Record Notebook	: 10 marks
Procedure writing	: 15 marks
Volumetric estimation	: 30 marks
TOTAL	: 60 marks

For Volumetric Estimation if the student have

Less than 2% Error	-	30 marks
2-3% Error	-	25 marks
3-4% Error	-	20 marks
3-5% Error	-	15 marks
Greater than 5%	-	10 marks

Text Book:

1. Vogel, Text book of Inorganic quantitative analysis, Longman Sc & Tech, 2008.

Reference Books:

1. Jeyavathana Samuel, Chemistry Practical Book, G.G.Printers, Chennai, 2012.

2. Vickie.M.Williamson, M.Larry Peck, Lab manual for General Chemistry, Cengage Learning India Private Limited, New Delhi, 2009.

3. Dr. V. V. Ramanujam, Inorganic Semimicro Qualitative Analysis, National Publishing Company, Chennai, 3rd edition, 1974.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
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Class	**: B.Sc (Chemistry)**	**Part III**	**: Allied**
Semester	**: IV**	**Hours**	**: 04**
Sub code	**: 17UCHA41**	**Credits**	**: 04**

ALLIED MATHEMATICS –II

Course outcomes

CO1: To familiarize Vector differentiation of vectors
CO2: To introduce basic statistical concepts and the method of interpolation.
CO3: To familiarize the concepts on attributes and index number.
CO4: To provides the capability of solving the problems on skill development

Unit - I Vector differentiation- Velocity- Acceleration – Vector Differential Operators- Gradient

Unit -II Divergence and Curl- Directional derivative- Solenoidal – Irrotational vectors.

Unit - III Lagranges and Newton's Method –Interpolation.

Unit - IV Theory of Attributes.

Unit - V Index Numbers- Aggregate Method- Average of Price Relative Method .

Weighted Index Number- Laspeyre's, Paasche's and Fisher's Index Number only.

Text Books:

1) S.Arumugan, **Ancillary Mathematics Volume II**, New Gamma Publication, Palayamkottai, Reprint 2006.

   Unit I - Chapter 1 : Page No : 1 to 20
   Unit II - Chapter 1 : Page No 20 to 34

2) S.Arumugam and A.Thangapandi Isaac, **Statistics**, New Gamma Publishing House, Palayamkottai, 2009.

   Unit III - Chapter 7 : Section 7.2 to 7.3
   Unit IV - Chapter 8 : Section 8.1
   Unit V - Chapter 9 : Section 9.1

Reference Books :

1) Durai Pandian, Laxmi Durai Pandian ,Udayabaskaran, **Algebra and Calculus of Vectors,** S.Viswanthan Printers and Publishers Pvt Ltd, Chennai,1980,

2) S.P.Gupta, **Statistical Methods** , Sultan Chand and Sons Educational Publishers, New Delhi,2014.

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Class	**: B.Sc (Chemistry)**	**Part III**	**:Allied**
Semester	**:IV**	**Hours**	**:04**
Subject Code	**:15UMTA41**	**Credits**	**:04**

ALLIED PHYSICS –IV
OPTICS, SPECTROSCOPY AND MODERN PHYSICS

Course Outcomes:

CO1: To enable the students to understand the basic concepts of optics, Spectroscopy and Modern physics.

CO2: To understand the lens, refraction, dispersion, interference and diffraction.

CO3: To Study about the IR, UV and Planck radiations and De Broglie theory

CO4: To understand the work function skill in the area of Optics, spectroscopy and Modern Physics.

Unit- I

Deviation produced by thin lens – Focal length of two thin lenses in and out of contact – Cardinal points – Refraction through a thin prism – Dispersion – Dispersive power – Combination of thin prisms to produce (a) Deviation without dispersion and (b) Dispersion without deviation – Direct vision spectroscope – Chromatic aberration in lenses – Spherical aberration in lenses – Theory of primary and secondary rainbows.

Unit -II

Interference in thin films – air wedge – Newton's rings (reflected beam only) – Determination of wavelength – Jamin's interferometer – Principle and uses – Diffraction – Theory of plane transmission grating (normal incidence only) – Experiment to determine wavelengths.

Unit -III

Double refraction – Nicol prism – Construction, action and uses – Quarter wave plate (QWP) – Half wave plate (HWP) – Optical activity – Biot's laws – Specific rotatory power – Half shade polarimeter – Determination of specific rotatory power – Fibre optics – Light propagation in fibres – Fibre optic communication system - Advantages.

Unit -IV

Infra red radiations – Sources, properties and uses – Ultra violet radiations - Sources, properties and uses – Planck's quantum theory – Raman effect – Experimental study of Raman effect(simple theory) Quantum theory of Raman effect – Applications – Photo electricity – Laws of photo electricity – Photo electric cells – Types(Photo emissive, Photoconductive and Photovoltaic cells) and their uses – Applications of photo electric cells.

Unit-V

De Broglie's theory – Electron diffraction – G.P.Thomson's experiment – Michelson Moreley experiment – Significance of the negative results – Postulates of special theory of relativity – Lorentz transformation equations - Length contraction – Time dilation – Variation of mass with velocity – Mass - energy equivalence.

Text Book:

1. R. Murugesan, **Optics, Spectroscopy and Modern Physics,** S.Chand and Company Ltd, New Delhi, 2010.

   Unit – I : 1.1 – 1.24

   Unit – II : 2.1 – 2.10

   Unit – III : 3.1 – 3.21

   Unit – IV : 4.1 – 4.14

   Unit – V : 5.1 – 5.11

Reference Books:

1. Kakani and Bhandari Sultan , **Optics and Spectroscopy,** Chand and Sons,New Delhi,2004.
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.
4. R.Murugesan and Kiruthiga Sivaprasath, **Modern Physics**, S.Chand and Co, Sixteenth Edition, New Delhi, 2012.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class	**: B.Sc (Chemistry)**	**Part III**	**:Allied**
Semester	**:III & IV**	**Hours**	**:02**
Subject Code: 15UMTAP2		**Credits**	**:01**

ALLIED PHYSICS PRACTICAL – II

Course Outcomes:

CO1: To understand the thickness of wire using Air wedge method, radius of curvature by Newton's rings
CO2: To analyse the spectrum with the help of a prism and grating
CO3: To enable the students to know about Bridge rectifier, Transistor characteristics
CO4: To develop the skill to mensure the physics experimental values.

Any 14 experiments.

1. Mirror Galvanometer - Voltage and current sensitiveness
2. LCR – Series resonance - Determination of L & Q factor
3. Air wedge - Thickness of a wire
4. Dispersive power of a prism - Spectrometer
5. Grating N by λ Normal incidence - Spectrometer
6. Newton's rings - Determination of radius of curvature
7. Bridge rectifier - Pi filter
8. Transistor characteristics - CE mode
9. Single stage transistor amplifier
10. Hartley oscillator
11. Logic gates – AND, OR, NOT Using Discrete Components. - Truth table verification
12. Logic gates – NAND, NOR Using Discrete Components. - Truth table verification
13. Zener diode characteristics and break down voltage
14. OP AMP as an adder and subtractor
15. Comparison of capacitances - Desauty's method using headphone
16. LCR – Parallel resonance.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF CHEMISTRY
(For those who joined in 2017 and after)

Class : B.Sc (Chemistry)	**Part IV: NME**
Semester : IV	**Hours : 02**
Subject Code : 17UFDN41	**Credits : 02**

FOOD PRESERVATION AND SAFETY

Course Outcomes:

CO 1 : To provide fundamental understanding of food spoilage and preservation.

CO 2: To equip with Commercial preservation technologies to maintain fresh and minimal processed food.

CO 3: To apply scientific knowledge on food safety.

CO4: To understand the skill in the area of food preservation and safety.

Unit-1

Food preservation: Food spoilage, Principles of food preservation, preservation methods.

Unit -2

Food Additives: Definition, Major categories of food additives, functions and uses

Unit -3

Food Adulteration - Adulteration, Adulterant - Definition, types - Intentional and Incidental, methods of detection.

Unit -4

Safe Food handling and Storage: Different Aspects of Food safety, Hygiene - Environmental, Personal, food handling, storage, wholesome food.

Unit -5

Food Preservation: Pickles, Sauce, Squash, jam, jelly - Skill development classes (Add on course - Certificate course).

Reference Books:

1. B. Srilakshmi, **Food science,** New Age International Publishers, New Delhi.
2. B. Srilakshmi, Human Nutrition (For B.Sc Nursing Students)New Age International Publishers, New Delhi.