JAYARAJ ANNAPACKIAM COLLEGE FOR WOMEN (AUTONOMOUS)

A Unit of the Sisters of St. Anne of Tiruchirappalli

Accredited with 'A' Grade (3rd Cycle) by NAAC

DST FIST Supported College

Affiliated to Mother Teresa Women's University, Kodaikanal

PERIYAKULAM – 625 601, THENI DT. TAMIL NADU.

ACADEMIC COUNCIL

DEPARTMENT OF CHEMISTRY

09.09.2020

PG AND RESEARCH CENTRE OF CHEMISTRY

U.G. PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
2.	Formulate hypothesis, design experiments, use appropriate tools and interpret the results.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
5.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities such as self-esteem, positive attitude, self-discipline, and self-motivation.

U.G. PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Apply knowledge in various aspects of chemistry in fields such as organic, inorganic, physical, analytical, spectral, biochemical and environment	PO-1, PO-2
2.	Exhibit problem solving skills and analytical skills	PO-2, PO-3
3.	Realize the values of chemistry in our daily life and discharge knowledge and skills as analyst in small scale industries, cottage industries and quality control sectors	PO-5, PO-6
4.	Pursue higher education in the field of chemistry and in different horizon of life	PO-4, PO-5
5.	Fix their feet and brighten their career in the field of chemistry for sustainable future and face emerging opportunities and challenges	PO-1, PO-4, PO-6

UG COURSE PATTERN (2020-2023) (UGC/ TANSCHE/ MTU)

Sem.	Part	Code	Title of the paper	Hours	Credits
I	I	20GT1GS01/ 20GH1GS01/ 20GF1GS01	Tamil - I Hindi - I French - I	6	3
	II	20GE1GS01	English - I	6	3
	III	20CH1MC01	General Concepts in Chemistry - I	6	6
		20CH1CP01	Practical: Semi-micro Inorganic Qualitative Analysis¤	3	-
		20MA1AC01/ 20ZO1AC01	Allied Mathematics - I/ Allied Zoology - I	5/3	4/3
		20ZO1AP01	Allied Zoology Practical - I	2	1
	IV	20CH1AE01	**AbilityEnhancementCompulsory Course (AECC)-1** Professional English	2	2
	IV	20SE1CE1B	**Skill Enhancement Compulsory Course (SECC)- 1** Computer Education	2	2
	V	20STPNS01/ 20STPNC01/ 20STPPE01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education		
			Total	**30**	**20**
II	I	20GT2GS02/ 20GH2GS02/ 20GF2GS02	Tamil - II Hindi - II French - II	6	3
	II	20GE2GS02	English - II	6	3
	III	20CH2MC02	General Concepts in Chemistry - II	6	6
		20CH2CP01	Practical: Semi-micro Inorganic Qualitative Analysis¤	3	3
		20MA2AC02/ 20ZO2AC02	Allied Mathematics - II/ Allied Zoology - II	5/3	4/3
		20ZO2AP02	Allied Zoology - Practical - II	2	1
	IV	20AE2ES02	**Ability Enhancement Compulsory Course (AECC)-2:** Environmental Studies	2	2
	IV	20SE2CB02	**Skill Enhancement Compulsory Course (SECC)-2:** Capacity Building	2	2
	V	20STPNS01/ 20STPNC01/ 20STPPE01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education	-	-
			Total	**30**	**23**

Sem.	Part	Code	Title of the paper	Hours	Credits
III	I	20GT3GS03/ 20GH3GS03/ 20GF3GS03	Tamil - III Hindi - III French - III	6	3
	II	20GE3GS03	English - III	6	3
	III	20CH3MC03	Inorganic and Organic Chemistry	6	6
		20CH3CP02	Practical: Microscale Analysis of Organic Substances	3	2
		20CH3AC03	Allied Physics - Theory	3	3
		20CH3AP03	Allied Physics - Lab	2	1
		20CH3DE1A/ 20CH3DE1B	**Discipline Specific Elective - 1** Electrochemistry/ Dairy Chemistry	4	3
	V	20STPNS01/ 20STPNC01/ 20STPPE01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education	-	-
			Total	**30**	**21**
IV	I	20GT4GS04/ 20GH4GS04/ 20GF4GS04	Tamil - II Hindi - II French - II	6	3
	II	20GE4GS04	English - II	6	3
	III	20CH4MC04	Physical and Organic Chemistry	6	6
		20CH4CP03	Practical: Volumetric Analysis	3	2
		20CH4AC04	Allied Physics - Theory	3	3
		20PH4AP04	Allied Physics - Lab	2	1
		20CH4DE2A/ 20CH4DE2B	**Discipline Specific Elective - 2** Co-ordination Chemistry/ Fuel Chemistry	4	3
	V	20STPNS01/ 20STPNC01/ 20STPPE01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education	-	2*
	V	20SLPEX01	**Service Learning Programme-** Extension JACEP	-	-
			Total	**30**	**21+2***

Sem.	Part	Code	Title of the paper	Hours	Credits
V	III	20CH5MC05	Organic Chemistry - I	6	6
		20CH5MC06	Physical Chemistry - I	6	6
		20CH5MC07	Inorganic Chemistry - I	5	5
		20CH5CP04	Practical: Physical Chemistry	5	3
		20CH5DE3A/ 20CH5DE3B	**Discipline Specific Elective - 3** Analytical Chemistry/ Molecules of Life	4	3
	IV	20CH5GE01/ 20GE5NC01	**Generic Elective - 1 (NME)** Applied Chemistry/ NCC - National Integration and Personality Development	2	2
	IV	20SE5AB03	**Skill Enhancement Compulsory Course (SECC)-3:** Aptitude Building	2	2
	V	20SLPEX01	**Service Learning Programme-** Extension JACEP	-	4*
			Total	**30**	**27+4***
VI	III	20CH6MC08	Organic Chemistry - II	6	6
		20CH6MC09	Physical Chemistry - II	6	6
		20CH6MC10	Inorganic Chemistry - II	5 +1#	6
		20CH6CP05	Practical: Inorganic Preparation and Gravimetric Estimation	5	3
		20CH6DE4A/ 20CH6DE4B	**Discipline Specific Elective - 4** Spectroscopy and its Applications to Chemistry/ Nano Chemistry	4	3
	IV	20CH6GE02/ 20GE6NC02	**Generic Elective - 2 (NME)** Usage of Chemicals in Daily Life/ NCC - Organization and Health Programme in NCC	2	2
	IV	20SE6CH04	**Skill Enhancement Compulsory Course (SECC) 4:** Entrepreneurship Skills in Chemistry	2	2
	V	20CH6SS01/ 20CH6SM01	**Self Study Course:** Principles and Applications of Green Chemistry/ MOOCs	-	2*
			Total	**30+1#**	**28+2***
			Total	**180**	**140+8***

¤ Credits will be awarded in II semester
*** Extra Credits**
 # Outside the class hours

ALLIED COURSES OFFERED BY THE DEPARTMENT FOR

I B.Sc. ZOOLOGY (R+SF)

Sem.	Part	Code	Title of the Paper	Hours	Credit
I	III	20CH1AC01	Allied Chemistry-I	3	3
	III	20CH1AP01	Allied Practical I: Volumetric Analysis	2	1
II	III	20CH2AC02	Allied Chemistry-II	3	3
	III	20CH2AP02	Allied Practical II: Organic Analysis	2	1

FOR II B.Sc. PHYSICS (R+SF)

Sem.	Part	Code	Title of the Paper	Hours	Credit
III	III	20CH3AC01	Allied: General Chemistry -I	3	3
	III	20CH3AP01	Allied Practical I: Organic Analysis	2	1
IV	III	20CH4AC02	Allied: General Chemistry -II	3	3
	III	20CH4AP02	Allied Practical II: Volumetric Analysis	2	1

CERTIFICATE COURSE (NON SEMESTER)

Code	Title of the Course	Hours	Credit
	Skill Development Programme (SDP)		
20CH1SD01	IT skills for Chemists	60	2

DIPLOMA COURSE (NON SEMESTER)

Code	Title of the Course	Hours	Credit
DCCHMC01	Chemistry of Modern Cosmetics	60	2
DCCHMCP1	Handling Cosmetics-Lab (Internal only)	60	2

GENERAL CONCEPTS IN CHEMISTRY - I

Semester: I **Hours: 6**

Code : 20CH1MC01 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the structure of atom and shape of the orbital	PSO-1	K, C
CO - 2	Predict the hybridization and the types of bonding	PSO-1	Ap
CO - 3	Acquire the knowledge on preparation and properties of alkanes, alkenes and alkynes	PSO-4	K, An
CO - 4	Explain the general characteristics of ideal and real Gases	PSO1,PSO-4	C
CO - 5	Summarize the various aspects of colloidal state	PSO-3	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				**GENERAL CONCEPTS IN CHEMISTRY - I**							**Hours: 6**
Code : 20CH1MC01											**Credits: 6**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO1	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	3.18
CO2	4	4	4	4	3	2	2	4	2	3	3	3.45
CO3	4	4	4	4	2	2	4	4	3	3	4	3.36
CO4	4	4	4	4	2	2	3	4	2	4	4	3.45
CO5	4	4	4	4	3	2	3	4	4	3	3	3.81
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

STRUCTURE OF ATOM:

Introduction - Bohr's postulates - Hydrogen spectrum - de Broglie concept of particle and wave character (dual character of electron)- derivation of de Broglie equation and Bohr angular momentum- experimental verification of de Broglie's relation - related simple problems - Heisenberg's uncertainty principle - Schrodinger Wave equation (equation only)- s, p, d, f orbitals and their shapes - Probability distribution of electrons around the nucleus - concept of atomic orbitals - differences between orbit and orbital - quantum numbers - Pauli's exclusion principle - Slator's rule: The concept of effective nuclear charge - simple calculations - applications - Hund's rule of maximum multiplicity - the Aufbau principle - electronic configuration of the elements - extra stability of half filled and completely filled orbitals **(18 Hours)**

UNIT II

STRUCTURE AND BONDING:

Introduction - hybridization - types of hybridization (sp^3, sp^2, sp) - types of covalent bonds - sigma bond - pi bond - bond length and factors affecting bong length: hybridization - electronegativity - delocalization - bond angles and factors affecting bond angles: hybridization - lone pair repulsion - electronegativity of central atom - bond energies - localized and delocalized chemical bonds - 1,3-butadiene and benzene - Van der Waals interactions or London Forces - inclusion compounds - charge- transfer complexes - inductive effect - application of inductive effect - field effect - electomeric effect - resonance - resonance energy - mesomeric effect- hyperconjugation - aromaticity (Huckel's Rule only) - hydrogen bonding - types of hydrogen bonding

ORGANIC REACTIONS AND INTERMEDIATES:

Introduction - notation used in organic chemistry: curved arrow notation, half headed arrow - homolytic and heterolytic bond breaking - types of reagents - electrophilic and nucleophilic reagents - types of organic reactions - substitution - addition - rearrangement - elimination reactions - $E_1$and E_2 mechanism - reactivity rates of reaction and energy profile - collision theory. Reactive intermediates - structure, formation and stability of carbocations, carbanions and carbon free radicals **(18 hours)**

UNIT III

a) ALKANES:

Introduction - IUPAC Nomenclature of branched and unbranched alkanes - the alkyl groups - classification of carbon atoms in alkanes - isomerism in alkanes - general methods of preparation : from decarboxylation of aliphatic monocarboxylic acids - Kolbe's electrolytic method - from alkyl halide - hydrogenation of alkenes and Corey -House synthesis - physical properties - chemical properties : oxidation - pyrolysis - isomerism - substitution reaction - aromatization

b) ALKENES:

Nomenclature - general methods of preparation : dehydration of alcohols and dehydrohalogenation of alkyl halide - dehalogenation of vicinal dihalides with zinc or iodide ion - electrolysis of salt of dicarboxylic acid - orientation in elimination reaction - Saytzeff and Hofmann rules - properties of alkenes: addition of halogen acids - Markownikoff's rule - alkadienes- nomenclature - classification -properties: 1,2 and 1,4 addition of halogens - Diels Alder reaction

c) ALKYNES:

Nomenclature - structure and bonding in alkynes - general methods of preparation- acidityofalkynes **(18 Hours)**

UNIT IV

GASEOUS STATE:

Kinetic molecular theory of gases- postulates of molecular theory of gases- kinetic energy and temperature- derivation of gas laws: Boyle's law, Charle's law, Avagadro's law, ideal gas equation, Graham's law of diffusion, Dalton's law of partial pressures - thermal motion of the molecules - Real gases - deviation of real gases from ideal behavior and compressibility factor - effect of temperature on deviations from ideal behavior- explanation for the deviations -van der Waals equation of state - derivation of the van der Waals equation- critical constants of a gas - P-V isotherms of carbon dioxide - molecular velocities: Maxwell's law of distribution of molecular velocities - types of molecular velocities - collision diameter- collision number - collision frequency- mean free path - liquefaction of gases: Joule- Thomson effect - Linde's apparatus- applications of liquefied gases

(18 Hours)

UNIT V

COLLOIDAL STATE:

Introduction - colloidal systems - classification of colloids: classification based on nature of interaction and manner of aggregation of colloidal systems - preparation of colloidal solutions: colloid mill, electrical dispersion and condensation methods - purification of colloidal solutions: dialysis - ultra filtration general properties of colloidal systems - properties of hydrophobic colloidal systems: electrical properties - origin of charge on colloidal particles - electrical double layer - protective colloids - Gold number - electrokinetic properties: electro osmosis - emulsions - classification - identification of the types of an emulsion - emulsifiers - applications of emulsions - colloidal electrolytes - importance and applications of colloids

(18 Hours)

COURSE BOOKS:

1. B. R. Puri, L. R. Sharma and K. C. Kalia, Graduate Inorganic Chemistry, Vishal Publishing Co., Volume - I, 2017 - 18 **Unit I**

2. M.K. Jain and S.C. Sharma and Fateh Bahadur, Graduate Organic Chemistry, Vishal Publishing Co., Volume - I, 2018-19 **Unit II and III**

3. Puri, Sharma, Pathania and Lark, Graduate Physical Chemistry, Vishal Publishing Co., Volume - I, 2018-19 **Unit IV and V**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th Edition, 2007
2. K.S. Tewari, N.K. Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2006
3. Arun Bahl, B.S. Bahl, Advanced Organic Chemistry, S. Chand and company Ltd. 1st edition,2006
4. B.R. Puri, L.R. Sharma and S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 46th edition,2012
5. P.L. Soni, M. Katyal, Test book of Inorganic chemistry, Sultan Chand and Sons, 20th edition, 2006

PRACTICAL: SEMI-MICRO INORGANIC QUALITATIVEANALYSIS

(Examination at the end of II Semester)

Semester: I & II **Hours: 3+3**

Code : 20CH1CP01 & 20CH2CP01 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Analyse cations and anions present in a given inorganic sample adopting systematic procedure	PSO-1	K, An
CO - 2	Acquire skills to perform precipitation and Centrifugation methods	PSO-2	K, An
CO - 3	Identify and eliminate interfering anions in a given sample	PSO2,PSO3	E
CO - 4	Appreciate the characteristic quality of a inorganic substance	PSO-3	An
CO - 5	Adopt safety measures in handling chemicals	PSO-3	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I & II												**Hours: 3+3**
Code : 20CH1CP01& 20CH2CP01							**PRACTICAL: SEMI-MICRO INORGANIC QUALITATIVEANALYSIS**					**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO1	3	3	5	3	3	3	4	4	4	4	4	3.63
CO2	4	3	4	3	3	3	4	4	4	3	4	3.54
CO3	5	3	4	3	3	3	4	4	4	3	4	3.63
CO4	5	3	4	3	3	3	4	4	5	4	4	3.81
CO5	4	3	4	3	4	4	4	4	4	3	4	3.72
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

Analysis of a mixture containing two cations and two anions of which, one is interfering anion following semi-micro method.

ANIONS:

Carbonate, sulphate, nitrate, chloride, bromide, oxalate, borate, phosphate, chromate and fluoride

CATIONS:

Lead, copper, cadmium, bismuth, antimony, iron, aluminium, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium and ammonium

COURSE BOOK:

1. V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu , Basic principles of Practical chemistry , Sultan Chand and sons, 2nd edition, 2012

ALLIED CHEMISTRY - I (I B.Sc. ZOOLOGY)

Semester: I **Hours: 3**

Code : 20CH1AC01 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain the periodicity of elements and the fundamentals in chemistry	PSO-1	K
CO - 2	Describe about atomic structure and chemical bonding	PSO-2	C
CO - 3	Classify carbohydrates, proteins, amino acids and to illustrate its structure, properties and analyze vitamins deficiency diseases	PSO-1	K
CO - 4	Evaluate the empirical and molecular formula for the given organic compound	PSO-3	An, E
CO - 5	Categorize the types of polymers demonstrate the application of commercially available polymers	PSO-4	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I											**Hours: 3**
Code : 20CH1AC01				**ALLIED CHEMISTRY - I**							**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO1	4	4	3	4	3	4	4	4	3	4	3	3.64
CO2	4	4	4	4	3	4	3	4	3	4	4	3.73
CO3	4	4	4	3	4	3	4	4	4	4	3	3.73
CO4	4	3	4	4	3	3	4	4	3	4	3	3.54
CO5	4	3	4	3	4	3	4	4	3	4	4	3.64
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

PERIODIC TABLE:

Modern periodic table - groups and periods - classification of elements on the basis of electronic configuration - properties of elements - atomic radii - ionic radii - size of atoms and ions - ionization energy - electro negativity **(9 Hours)**

UNIT II

STRUCTURE OF ATOM:

Bohr model of an atom - merits and demerits - Sommerfield modification - wave nature - de Broglie's equation - difference between orbit and orbital - shapes of atomic orbitals

BONDING:

Valence Bond(VB) theory - s-s, s-p and p-p overlap - application to the formation of simple molecules like hydrogen and oxygen - Molecular Orbital(MO) theory - MO diagram for H_2, O_2 and F_2 - difference between VB theory and MO theory **(9 Hours)**

UNIT III

CARBOHYDRATES:

Definition - sources - classification-reducing and non reducing sugars Properties of glucose: addition with HCN, $NaHSO_3$ and Phenyl hydrazine-sucrose: inversion of sucrose- uses-Ring and Haworth structure of glucose and fructose- tests for carbohydrates

AMINO ACIDS: Classification - properties: dipolar structure -Zwitter ion - uses

PROTEINS: Color reactions of proteins - structure of protein

VITAMINS: Classification - sources - deficiency diseases **(9 Hours)**

UNIT IV

DEDUCING MOLECULARFORMULA:

Detection of nitrogen, halogen and sulphur in organic compounds (Lassigne's test) - definition of Empirical Formula (EF), Molecular Formula(MF) and Structural Formula (SF)- calculation of empirical and molecular formula from their percentage composition- difference between EF, MF and SF **(9 Hours)**

UNIT V

POLYMER CHEMISTRY:

Definition - classification of polymers based on origin, mode of formation, structure and application - rubber - natural rubber - vulcanization - synthetic rubbers - preparation and uses of buna rubbers and neoprene

PLASTICS: Thermoplastics and thermosetting plastics - distinction and uses

RESINS: Definition - preparation and uses of Bakelite **(9 Hours)**

COURSE BOOK:

Study material prepared by the Department of Chemistry

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th edition, 2007
2. P.L. Soni , Mohan Katyal, Text Book of Inorganic Chemistry, Sultan Chand and Sons, 20th edition, 2006
3. B.R. Puri, L.R. Sharma and S. Pathania, Physical Chemistry, Vishal Publishing Co, 41st edition,2004

ALLIED PRACTICAL I: VOLUMETRIC ANALYSIS

(Examination at the end of I Semester)

Semester: I **Hours: 2**

Code : 20CH1AP01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain practical knowledge about various types of titrations and indicators	PSO-1	K
CO - 2	Apply the skills to do the volumetric titration in double burette method	PSO-3	Ap
CO - 3	Demonstrate the principles of titrimetry	PSO-2	C
CO - 4	Analyze titrimetric data systematically estimate the amount of substance in a given solution.	PSO-2, PSO-5	An
CO - 5	Adopt the safety rules and apply their skills in life	PSO-3	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				**ALLIED PRACTICAL I: VOLUMETRIC ANALYSIS**							**Hours: 2**
Code : 20CH1A P01											**Credits: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO1	4	4	4	4	3	2	4	4	4	3	3	3.54
CO2	4	4	4	4	3	2	4	4	4	3	3	3.54
CO3	4	4	4	4	3	2	4	4	4	3	3	3.54
CO4	4	4	4	4	3	2	4	4	4	3	3	3.54
CO5	4	4	4	4	3	2	4	4	4	3	3	3.54
Overall Mean Score												**3.54**

Result: The score for this course is **3.54**

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

A double titration involving making up of the solution to be estimated following double burette method

I. ACIDIMETRY AND ALKALIMETRY:

1. Estimation of NaOH
2. Estimation of Na_2CO_3
3. Estimation of HCl
4. Estimation of oxalic acid

II. PERMANGANIMETRY:

1. Estimation of ferrous sulphate
2. Estimation of ferrous ammonium sulphate
3. Estimation of oxalic acid

III. IODOMETRY:

1. Estimation of potassium dichromate (demonstration only)

BOOK FOR REFERENCE:

Practical guide prepared by the Chemistry Department

PROFESSIONAL ENGLISH

Semester: I **Hours: 2**

Code : 20CH1AE01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognise their own ability to improve their competence in using the language	PSO-1, PSO-4	C,AP, S
CO - 2	Use language for speaking with confidence in an intelligible and acceptable manner	PSO-1, PSO-4, PSO-3,PSO-5	C, AP, E
CO - 3	Read independently unfamiliar texts with comprehension	PSO-2, PSO-3, PSO-5	K,C, AP,E
CO - 4	Understand the importance of reading for life and writing in academic life.	PSO-1, PSO-3, PSO-4, PSO-5	C, AP, E
CO - 5	Write simple sentences without committing error of spelling or grammar	PSO-4	C,E

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				**PROFESSIONAL ENGLISH**							**Hours: 2**
Code : 20CH1AE01											**Credits: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	4	4	4	4	4	4	3	4	4	4	3.90
CO-2	3	4	4	4	4	4	4	3	4	4	4	3.81
CO-3	4	3	3	3	4	4	4	4	3	3	4	3.63
CO-4	3	4	4	3	4	4	4	3	3	3	4	3.54
CO-5	3	4	3	3	3	3	3	4	4	4	4	3.45
Overall Mean Score												**3.68**

Result: The score for this course is 3.68 (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

NB: All four skills are taught based on texts/passages.

UNIT I: COMMUNICATION

Listening: Listening to audio text and answering questions - Listening to Instructions

Speaking: Pair work and small group work

Reading: Comprehension passages –Differentiate between facts and opinion

Writing: Developing a story with pictures

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT II: DESCRIPTION

Listening: Listening to process description. - Drawing a flow chart.

Speaking: Role play (formal context)

Reading: Skimming/Scanning - Reading passages on products, equipment and gadgets

Writing: Process Description –Compare and Contrast - Paragraph- Sentence Definition and Extended definition-Free Writing

Vocabulary: Register specific -Incorporated into the LSRW tasks

UNIT III: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields (Subject specific)

Speaking: Brainstorming (Mind mapping) - Small group discussions (Subject - Specific)

Reading: Longer Reading text

Writing: Essay Writing (250 words)

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT IV: PRESENTATION SKILLS

Listening: Listening to lectures

Speaking: Short talks

Reading: Reading Comprehension passages

Writing: Writing Recommendations - Interpreting Visuals inputs

Vocabulary: Register specific -Incorporated into the LSRW tasks

UNIT V: CRITICAL THINKING SKILLS

Listening: Listening comprehension- Listening for information

Speaking: Making presentations (with PPT- practice)

Reading: Comprehension passages – Note making - Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills)

Writing: Problem and Solution essay– Creative writing –Summary writing

Vocabulary: Register specific - Incorporated into the LSRW tasks

COURSE BOOK:

- *English for Physical Sciences* by Tamil Nadu State Council for Higher Education

INTERNAL ASSESSMENT	
COMPONENTS	**MARKS**
Test-I	30
Test-II	30
Listening Comprehension	10
Reading Comprehension	10
Language lab (Speaking skills)	10
Assignment	10
Total	**100**

PROFESSIONAL ENGLISH - 20CH1AE01

QUESTION PATTERN

Time: 1 Hour **Max. Marks: 30**

I. Match the following 10

or

True or False

II. Writing Definition 5

or

Transcript of a passage

III. Sketch mind maps for the following 10

or

Essay Writing

IV. Comprehension on short talks 5

or

Writing Recommendations

GENERAL CONCEPTS IN CHEMISTRY - II

Semester: II **Hours: 6**

Code : 20CH2MC02 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain the periodicity variation and properties of block elements	PSO-1	K, C
CO - 2	Acquire knowledge about oxidation and reactions and the concepts of nuclear chemistry and radioactivity	PSO-1	K, Ap
CO - 3	Appreciate the reactions of alkyl halides and cyclo alkanes	PSO-1, PSO-2	K, An
CO - 4	Recall the characteristics of the phenomena such as catalysis and adsorption	PSO-1, PSO-4	C, Ap
CO - 5	Outline the fundamentals of photochemistry	PSO-3, PSO-4	K, Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**GENERAL CONCEPTS IN CHEMISTRY - II**								**Hours: 6**
Code : 20CH2MC02												**Credits: 6**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO1	4	3	3	3	4	3	4	4	5	3	4	3.63
CO2	4	3	3	3	4	3	4	4	5	3	4	3.63
CO3	3	4	4	3	4	3	3	4	4	3	4	3.54
CO4	3	3	4	3	3	3	4	4	3	3	4	3.36
CO5	4	3	5	3	3	3	4	4	3	3	4	3.54
Overall Mean Score												**3.54**

Result: The score for this course is **3.54** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

a) PERIODIC PROPERTIES:

Long form of periodic table - position of elements in the periodic table-periods, groups - cause of periodicity - division of elements into s, p, d, and f blocks - periodic properties - sizes of atoms and ions - covalent radius - van der Waals radius - ionic radius- ionization energy- factors determining ionization energy, electron affinity and electronegativity

b) s-BLOCK ELEMENTS:

General characteristics of alkali metals and alkaline earth metals-physical properties-chemical properties-diagonal relationship - function of s- block elements **(18 Hours)**

UNIT II

a) OXIDATION AND REDUCTION:

Definition of oxidation and reduction- oxidising agent - reducing agent-oxidation number calculations - redox reactions- galvanic cells-oxidation and reduction potentials

b) NUCLEAR CHEMISTRY AND RADIOACTIVITY:

Nuclear chemistry, nuclear particles, packing fraction, mass defect - binding energy of the nucleus - related problems - binding energy and stability - nuclear fission : atom bomb - nuclear fusion: hydrogen bomb, energy of the sun - radio activity - rate of radioactivity disintegration - units of radioactivity - half life period - nature of radiations from radioactive elements -group displacements law -Geiger Muller counter - carbon dating **(18 Hours)**

UNIT III

a) ALKYL HALIDES:

Introduction - classification of monohaloalkanes - nomenclature - methods of preparation - physical and chemical properties - nucleophilic substitution reactions: S_N1 and S_N2 - Difference between S_N2 and S_N1 reactions - other reactions - polyhalogen compounds: Preparation and uses of tetrafluoroethylene, freons, chloroform, westron and difluoromethane

b) CYCLO ALKANES (Alicyclic Compounds):

Introduction -nomenclature-occurrence-general methods of preparation - physical and chemical properties - stability of cycloalkanes - Baeyer's Strain theory - Sachse-Mohr theory of Stainless rings - molecular orbital theory of angle strain - cyclopropane (banana bond)-difference between configuration and conformation - conformational isomers- conformations of cyclohexanes - mono-substituted and di-substituted cyclohexane **(18 Hours)**

UNIT IV

a) CATALYSIS:

Catalysis - auto catalysis - promoters - negative catalysis - general characteristics of catalytic reactions - types of catalysis - Homogenous catalysis: acid base catalysis, enzyme catalysis (No mechanism) - heterogeneous catalysis : examples for catalysis involving solid, liquid and gaseous reactants -usage of Lindlar catalyst, Adam's catalyst and Ziegler-Natta catalyst- industrial applications of catalysts

b) ADSORPTION:

Definition - difference between adsorption and absorption - physical and chemical adsorption - factors influencing adsorption - Freundlich adsorption isotherm - Langmuir adsorption isotherm - applications **(18 Hours)**

UNIT V

PHOTOCHEMIRY:

Introduction - photophysical and photochemical processes - importance of photochemistry - difference between thermochemical and photochemical reactions - light absorption by solutions :Beer- Lambert law - laws of photochemistry: Grotthus - Draper law - Stark- Einstein law - quantum efficiency - photochemical reactions: decomposition of HI - luminescence : chemiluminesence - fluorescence - phosphorescence - Jablonski diagram - energy transfer in photochemical reactions: photosensitization - photosynthesis in plants - Lasers: Definition and applications in chemistry **(18 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R. Sharma and K.C. Kalia, Graduate Inorganic Chemistry, Vishal Publishing Co., Volume - I, 2017-18 **Unit I and II**
2. M.K. Jain and S.C. Sharma and Fateh Bahadur, Graduate Organic Chemistry, Vishal Publishing Co., Volume - I, 2018-19 **III**
3. Puri, Sharma, Pathaniya and Lark, Graduate of Physical Chemistry, Vishal Publishing Co., Volume - I & III, 2018-19 **Unit IV and V**

BOOKS FOR REFERENCE:

1. P.L. Soniand H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th Edition, 2007.
2. K.S. Tewari, N.K. Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2006
3. ArunBahl, B.S. Bahl, Advanced Organic Chemistry, S. Chand and company Ltd. 1st edition,2006
4. B.R. Puri, L.R. Sharma and S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 46th edition,2012
5. P.L. Soni, M. Katyal, Test book of Inorganic chemistry, Sultan Chand and Sons, 20th edition, 2006.
6. R.D. Madan Modern Inorganic Chemistry, S. Chand and company Ltd., 3rd edition, 2012.

ALLIED CHEMISTRY - II

Semester: II **Hours: 3**
Code : 20CH2AC02 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the role of chemistry and usage of some important compounds	PSO-2	K, C
CO - 2	Gain knowledge on the principles of catalysis and surface chemistry	PSO-1	K
CO - 3	Appreciate the chromatographic techniques and their applications	PSO-2	K
CO - 4	Recognize the role of chemistry in agriculture	PSO-2	An, Ap
CO - 5	Explain some terms of electrochemistry and corrosion	PSO-3	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**ALLIED CHEMISTRY - II**							**Hours: 3**
Code : 20CH2AC02											**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO1	4	3	4	3	3	3	4	3	3	4	3	3.36
CO2	3	4	4	4	3	2	4	4	3	4	3	3.45
CO3	3	4	4	3	3	3	3	4	3	4	3	3.36
CO4	3	4	3	4	3	3	3	4	4	3	3	3.36
CO5	3	4	3	4	4	3	3	4	3	4	3	3.45
Overall Mean Score												**3.40**

Result: The score for this course is **3.54** (High Relationship)

Note:

Mapping	Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%
Scale	Scale	1	2	3	4
Relation	Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0
Quality	Quality	Very Poor	Poor	Moderate	High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNIT I

CHEMISTRY IN THE SERVICE OF MANKIND:

Antibiotics: definition - classification based on specificity and their gram staining methods-uses of penicillins, chloramphenicol, tetracyclines and streptomycin- **antipyretics:** definition - preparation and uses of aspirin and paracetamol - **analgesics:** definition, types and examples - **antiseptics and disinfectants:** definition, uses and examples **(9 Hours)**

UNIT II

SURFACE CHEMISTRY:

Adsorption - definition - difference between adsorption and absorption - types of adsorption - difference between physisorption and chemisorption - Freundlich adsorption isotherm - applications of adsorption

CATALYSIS:

General characteristics of a catalyst - types of catalysis - homogeneous catalysis, heterogeneous catalysis, acid-base catalysis, enzyme catalysis, auto catalysis - definitions and examples - catalytic poisoning - promoters - industrial applications of catalyst **(9 Hours)**

UNIT III

CHROMATOGRAPHY:

Definition - classification - applications of chromatography- thin layer chromatography (TLC): principle, choice of adsorbent and solvents, developing of chromatoplates, applications- Column chromatography(CG): Principle, choice of adsorbent and solvents, packing and developing of column, applications-paper chromatography: Principle, choice of adsorbent and solvents, application of sample, development of chromatogram: ascending, decending, radial techniques-R_f value-Applications **(9 Hours)**

UNIT IV

FERTILIZERS:

Definition - nutrients for plants - role of various elements in plant growth - natural and chemical fertilizers - classification of chemical fertilizers - manufacture of urea- mixed fertilizers - organic farming

INSECTICIDES AND PESTICIDES

Definition- preparation and uses of DDT and BHC **(9 Hours)**

UNIT V

ELECTROCHEMISTRY AND CORROSION:

Electrolytes, electrochemical cells-pH scale-definition - simple calculation - buffer solution: definition, types, example - corrosion-definition - disadvantages-Types-methods of prevention : galvanizing, tinning, cathodic protection, lacquers- and paints - inhibitors: Anodic and cathodic inhibitors **(9 Hours)**

COURSE BOOK:

Study material prepared by Department of Chemistry

BOOKS FOR REFERENCE:

1. B.R. Puri, L.R. Sharma and S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 41st edition, 2004
2. P.L. Soni and H.M Chawla, Text book of Organic Chemistry, Sultan Chand and Sons, 29th edition,2007
3. P.L. Soni and Mohan Katyal, Text book of Inorganic Chemistry, Sultan Chand and Sons, 20th edition, 2006

ALLIED PRACTICAL II: ORGANIC ANALYSIS

(Examination at the end of II Semester)

Semester: II **Hours: 2**

Code : 20CH2AP02 **Credits: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Realize the chemistry of fundamental organic reactions	PSO-2	An
CO - 2	deduce the aromatic/non aromatic and saturated/unsaturated nature of the organic substance	PSO-2	K, An
CO - 3	Identify the special element nitrogen and functional groups	PSO-1	E
CO - 4	Appreciate the characteristics of qualitative analysis	PSO-3	An
CO - 5	Adopt safety measures in handling chemicals	PSO-3	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				ALLIED PRACTICAL II: ORGANIC ANALYSIS								Hours: 2
Code : 20CH2AP02												Credits: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO1	4	5	3	4	4	3	3	4	3	3	3	3.55
CO2	4	4	4	3	3	3	4	4	3	4	3	3.55
CO3	4	2	3	3	3	2	3	4	3	3	3	3
CO4	5	3	4	3	4	3	3	4	4	3	3	3.55
CO5	4	4	4	3	3	3	4	5	3	3	3	3.55
Overall Mean Score												3.44

Result: The score for this course is **3.44** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

FUNCTIONAL GROUPS:

Primary amines, Amides, Aldehydes, Ketones, Carbohydrates, Esters, Acids and Phenols (Preparation of solid derivative not required) Report should contain the following

1. Aliphatic / Aromatic
2. Saturated / unsaturated
3. Presence / absence of special element nitrogen
4. Functional group

REFERENCE:

Practical guide prepared by the Chemistry Department

QUESTION PATTERN

B.Sc. Chemistry and Chemistry Allied for I B.Sc. Zoology (R & SF)

Blue print of question paper (Internal and External)

Continuous Internal Assessment Component (CIA)

Theory:

Component	Marks	Marks
Internal test I	40	Converted to 25
Internal test II	40	
Quiz	10	
Assignment	5	
Attendance	5	
Total	**100**	**25**

INTERNAL QUESTION PATTERN

(Max: 40Marks)

Part - A

10 Questions(MCQ) × 1Mark =10 Marks

Part - B

2 Questions × 5 Marks = 10 Marks (Internal Choice)

Part - C

2 Questions × 10 Marks = 20 Marks (2 Questions out of 3)

(Open Choice and atleast one Question from allotted Units)

EXTERNAL QUESTION PATTERN

(Max: 75Marks)

Part - A

10 Questions × 1Mark = 10 Marks

(Two Questions from each Unit)

Part - B

5 Questions × 5 Marks = 25 Marks

(Internal Choice and one set of Question from each Unit**)**

Part - C

4 Questions × 10 Marks = 40 Marks (4 Questions out of 6)

(Open Choice and atleast one Question from each Unit)

PRACTICAL:

Continuous Internal Assessment Component (CIA) - 40 Marks

External Practical Exam - 60 Marks

Passing Minimum

Semester Examination	
Theory	40% out of 75 Marks (i.e. 30 Marks)
Practical	40% out of 60 Marks (i.e. 24 Marks)

ENVIRONMENTAL STUDIES

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Endow with in-depth knowledge, analyze and apply the understanding of their discipline for the betterment of self and society.
2.	Synthesize ideas from various disciplines, enhance the interdisciplinary knowledge and extend it for research.
3.	Gain confidence and skills to communicate orally/ verbally in research platforms and state a clear research finding.
4.	Develop problem solving and computational skills and gain confidence to appear for the competitive examinations.
5.	Enhance knowledge regarding research by accumulating practical knowledge in specific areas of research.
6.	Achieve idealistic goals and enrich the values to tackle the societal challenges.

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Assess the scope and importance of environmental studies and need for public awareness	PO1,2,3
2.	Develop deeper understanding in classification of resources	PO 1,2,5
3.	Analyse the concept of an eco system	PO1,2,4,6
4.	Comprehend the definitions, causes and control measures of environmental pollutions	P O 1 ,5
5.	Participate in the environmental issues programmes from the unsustainable to sustainable development	PO 1 , 4,5,6

ENVIRONMENTAL STUDIES

Semester: II **Hours: 2**

Code : 20AE2ES02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the components of our planet earth.	PSO 1,2,4	K, A ,S
CO - 2	Elucidate the importance of the natural resources.	PSO 2,3,5	K, An, E
CO - 3	Summarise the energy status of the environment.	PSO1,2,5	K,A,An
CO - 4	Acquire knowledge on the conservation of our environment.	PSO1,4,5	K,AP,S
CO - 5	Analyse the significance of water and climate towards sustainable development.	PSO 2,3,5	K,An, Ap, S,E

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**ENVIRONMENTAL STUDIES**							**Hours: 2**
Code : 20AE2ES02											**Credits: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	3	4	3	4	5	4	5	4	5	4.09
CO - 2	3	4	3	4	3	4	5	4	4	4	4	3.81
CO - 3	3	4	3	4	3	4	5	4	4	4	4	3.81
CO - 4	3	4	3	4	3	3	5	4	5	5	4	3.90
CO - 5	4	4	3	4	3	4	5	4	4	4	5	4.00
Overall Mean Score for COs												**3.92**

Result: The Score for this Course is 3.92 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I: MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance - Need for public awareness **(2 Hours)**

UNIT II: NATURAL RESOURCES

Classification of Resources: Renewable and non - renewable resources - Forest resources, water resources, mineral resources, food resources, energy resources, Land resources - associated problems; Role of an individual in conservation of natural resources - Equitable use of sources for sustainable life styles. **(8 Hours)**

UNIT III: ECOSYSTEMS

Concept of an ecosystem - Structure and function of an ecosystem - producers, consumers and decomposers - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following Eco system: Forest, grass land, desert and aquatic. **(6 Hours)**

UNIT IV: ENVIRONMENTAL POLLUTION

Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards, Solid waste management, Role of an individual in prevention of pollution. **(8 Hours)**

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENTS

From unsustainable to sustainable development - Urban problems related to energy Water conservation, rain water harvesting, water shed management, Resettlement and rehabilitation of people, its problem and concerns, case studies, Environmental ethics, Climate change, global warming, acid rain and ozone layer depletion, nuclear accidents and holocaust, case studies. Waste land reclamation. Environmental protection act, air act, water act, wild life protection act. **(6 Hours)**

FIELD WORK

Visit to local area to document environmental assets- river/forest/ grassland/hill/ mountain.

COURSE BOOK:

Murugeshan, R., (2007). Environmental science and Engineering, Millenium publication, Madurai.

UNIT I : Section - 1.1 & 1.2

UNIT II : Section - 1.3 to 1.37

UNIT III : Section - 2.1 to 2.7 & 2.10 to 2.27

UNIT IV : Section - 3.1 to 3.37

UNIT V : Section - 4.1 to 4.17

Note: Tamil Version for Tamil Literature and History Tamil Medium Students.

Continuous Internal Assessment Component (CIA)

Theory:

Component	Marks
Internal test I	40
Internal test II	40
Quiz	10
Assignment	5
Attendance	5
Total	**100**

Continuous Internal Assessment Component (CIA)

Passing Minimum: 40% out of 100

Internal Question Pattern

Part - A

10 Questions × 1Mark =10 Marks

Part - B

2 Questions × 5 Marks = 10 Marks

(Internal Choice)

Part - C

2 Questions × 10 Marks = 20 Marks (2 Questions out of 3)

(Open Choice and atleast one Question from allotted Units)

SKILL ENHANCEMENT COMPULSORY COURSE (SECC -2)
CAPACITY BUILDING

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Fix healthy attitudes and standards to face the outside world.
2.	Develop healthy interpersonal, intrapersonal and social relationships.
3.	Analyze the portrayal of social issues depicted in films that help them aware of the issues and figure out ways to eliminate them.
4.	Identify the role of social media in the present scenario and adopt the positive changes.
5.	Build up qualities like team work, leadership and problem solving
6.	Improve perspectives on positive thinking, team work, and creativity

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Develop positive thinking that helps them to set and pursue for meaningful goals.	PO-1, 6
2.	Develop leadership qualities that lead them to inspire and guide people among peer groups and in workplaces.	PO-1, 2, 3, 6
3.	Assess the advantages and disadvantages of social media.	PO-2, 6
4.	Acquiring trade skills by developing social relationships effectively with trade experts.	PO-2,5,6
5.	Understand the portrayal of social causes in films	PO-3

CAPACITY BUILDING

Semester: II **Hours: 2**

Code : 20SE2CB02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO – 1	Realised the importance of physical health, emotional well-being, and stress management.	PSO-1	K
CO – 2	Apply the features of team work and strive to become good leaders.	PSO-2,4	Ap
CO – 3	Enhance their awareness on social media and e- learning.	PSO-3	Sy
CO - 4	Develop interactive skills in online trade, and become value based professionals.	PSO-4	Ap
CO - 5	Acquire film making skills.	PSO-5	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester : II				**CAPACITY BUILDING**							**Hours: 2**
Code : 20SE2CB02											**Credits: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	4	4	4	4	5	4	4	5	4	4	4.18
CO-2	4	4	5	4	4	4	4	4	4	4	4	4.09
CO-3	4	3	4	4	4	3	4	4	4	4	4	3.81
CO-4	5	4	4	4	4	3	4	4	5	4	3	4
CO-5	4	4	5	4	4	4	3	4	4	4	4	4
Overall Mean Score												**4.01**

Result: The score for this course is 4.01 (Very high)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

Positive thinking-Seven steps in dealing with doubts. Traits of positive thinking. Goal setting-techniques of positive thinking to achieve the goals-creativity and components of creativity (6 Hours)

UNIT II

Leadership - Types of Leadership - Team work and public speaking - Importance of maintaining good interpersonal relationship with Team - Motivation - Self confidence - Attitude - Working in Group - Time Management - Effective Planning. (6 Hours)

UNIT III

Skilful usage of Social media (Whatsapp, Twitter, Facebook, Instagram, other app). Cyber bulling, photo, video morphing & editing, fake news. Useful study apps, e learning apps, Health, Police, Lawyer help app, Social issues complaint app. (6 Hours)

UNIT IV

Online interaction with Experts – Mushroom Cultivation – Mrs. Arthi (Batlagundu) –Apiculture –Mrs. Josephine (Madurai), Garment making – Mr. Alagusundaram (Tirupur) - Terrace Garden – Mrs. Megala – (Madurai) – Spirulina Cultivation - D. Aarthi (Madurai) – Antenna Foundation, (Madurai) (6 Hours)

UNIT V

Film Review: Thani Oruvan , Peranmai, Dhangal, 36 Vayadhinile, Kaatrin Mozhi, Ratchasi, English Vinglish - Short Film Making–Submission of Short Flim. (6 Hours)

BOOKS FOR REFERENCE:

1. Power of positive thinking, Mile, D.J.Rohan Book Company Delhi, 2004.
2. Dolmans 1922, A Handbook Public Speaking 1922, New York, Harcourt Breaee and company.

1. http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/positive-thinking/art-20043950.
2. http://mayoclinic.org/healthy-lifestyle/stress-management/in-depth/3-simple-strategies-to-help-you-focus-and-de-stress/art-20390057.
3. http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/3-ways-to-become-more-stress-resilient/art-20267213
4. http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/3-ways-to-learn-patience-and-amp-up-your-well-being/art-20390072
5. http://www.mayoclinic.org/4-proven-ways-you-can-feel-happier/art-20390079
6. http://mayoclinic.org/healthy-lifestyle/adult-health/in-depth/anger-management/art-20048149
7. http://www.gaiam.com/blogs/discover/positive-thinking-strategies-to-help-you-achieve-yourgoals#:-text=Focus%20on%20what's20%20of20old%20failures.

8. http://www.linkedin.com/pulse/what-makes-positive-attitude-10-components-gary
9. http://ifflab.org/how-to-prevent-cyber-bullying -anti-cyber-bullying-law-in-india/
10. http://www.sciencedaily .com/terms/morphing.htm#:text=Morphing%20 is %special %effect,little%20 instruction%20 from%20the %20 user.
11. http://www.educationalappstore.com/
12. http:// www.mobihealthnews.com/37340/38-more-health-and-wellness-apps-that-connect-to-apples-healthkit
13. http://www.youtube.com/watch?v=skfqt9mm7j4
14. http://www.youtube .com/watch?v-rvy44i-ciE
15. https://www.youtube.com.com/watch?v=rINOELMCiqc
16. http:// www.youtube.com/watch?v=N5R-KCWPzr0&list=PLHw83Z MxtQ9 NdRd5yAxYrxkRsxqcvw iae@index=3
17. http://www.youtube.com/watch?v=PUzaLjSjERE
18. http:// www.youtube.com/watch?v=QkVue8XmVr8
19. http:// www.youtube.com/watch?v=XcRs4JBN43o
20. http:// www.youtube.com/watch?v=dzvpQG-2xC4

Continuous Internal Assessment Component (CIA)

Theory:

Component	Marks
Internal test I	40
Internal test II	40
Quiz	10
Assignment	5
Attendance	5
Total	**100**

Continuous Internal Assessment Component (CIA)

Passing Minimum: 40% out of 100

Internal Question Pattern

Part - A

10 Questions × 1Mark =10 Marks

Part - B

2 Questions × 5 Marks = 10 Marks
(Internal Choice)

Part - C

2 Questions × 10 Marks = 20 Marks (2 Questions out of 3)
(Open Choice and atleast one Question from allotted Units)

STREAM - B

COMPUTER EDUCATION

(for B.Sc. Mathematics, Physics and Chemistry Programmes)

Semester: I **Hours: 2**

Code : 20SE1CE1B **Credits: 2**

COURSE OUTCOMES:

- Handle the tools of MS office
- Create animations, presentations and documents
- Prepare spreadsheets using MS Excel for various applications
- Develop computational skills and apply Google Apps for ICT learning
- Use DTP skills to become an Entrepreneur.

MICROSOFT OFFICE 2017

MS WORD: (Word processing software)

1. Formatting
2. Table Creation
3. Mail Merge
4. Preparation of advertisement using drawing tool

MS EXCEL:(Electronic spread sheets)

1. Excel Function (statistical)
2. Data filtering and sorting
3. Mark sheet, pay bill Preparation
4. Data analysis using chart

MS POWERPOINT:(Presetation)

1. Theme - based presentation with Animation Effects
2. PPT Record Narration

Mobile APPLICATIONS I:

1. Gmail
2. Cloud based callendar, mail
3. Google docs
4. Google groups

MOBILE APPLICATIONS II:

1. E books
2. Video chat, online chat
3. Cloud storage
4. Form creation
5. Assistant

COURSE BOOK:

Study Material prepared by Mathematics, Physics and Chemistry.

BOOKS FOR REFERENCE:

1. D. P. Nagpal - Computer Fundamentals - S. Chand & Company Ltd, New Delhi - 1999.
2. V. Rajaraman - Fundamentals of Computers, 3rd edition - Prentice Hall of India Private Limited - 2001.
3. B. Ram - Computer Fundamentals, 3rd edition - New Age International Pvt. Ltd – 2010
4. Web resources

NATIONAL CADET CORPS

NON MAJOR ELECTIVE

Sem.	Part	Code	Title of Paper	Hours	Credits
V	IV	20GE5NC01	NCC - National Integration and Personality Development	2	2
VI	IV	20GE6NC02	NCC- Organization and Health Programme in NCC	2	2

INTERNAL COMPONENTS

Internal - I	:	30 marks
Internal - II	:	30 marks
Component - I	:	10 marks
Component - II	:	10 marks
Component - III	:	10 marks
Component - IV	:	10 marks
Total	**:**	**100 marks**

NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

Semester: V **Hours: 2**

Code : 20GE5NC01 **Credits: 2**

UNIT I: NATIONAL INTEGRATION

Motto of National Integration - Importance of National Integration Culture and heritage of Tamil Nadu. **(6 Hours)**

UNIT II: CIVIL AFFAIRS

Aim of aid to civil authority - Role of NCC Cadets during natural calamities - Types of disaster - Essential services during natural calamities **(6 Hours)**

UNIT III: CIVIL DEFENCE AND SELF DEFENCE

Civil Defence - Organization - Aims and services - Aid to Civil authorities in emergency - Self Defence -Aims of Self Defence - Women and Self Defence **(6 Hours)**

UNI IV: LEADERSHIP AND PERSONALITY DEVELOPMENT

Leadership - Types and traits - Man Management in NCC - Duties of a Good Citizen - Role of Youth in Nation Building - Morale - Factors which affect morale - Factors which develop high morale Personality Development - Factor influencing Personality-Time Management . **(6 Hours)**

UNIT V: SOFT SKILLS

Soft skills - interview skill - influencing skill - social skill - communication skill - self motivation - self esteem - body language. **(6 Hours)**

BOOK FOR REFERENCE:

Mishra R.C., **A Handbook of NCC,** Kanti Prakashan, Etawah, 2000.

ORGANIZATION AND HEALTH PROGRAMME IN NCC

Semester: VI **Hours: 2**

Code : 20GE6NC02 **Credits: 2**

UNIT I: INDIAN MILITARY AND NCC ORGANIZATION

History of Indian Military - Paramilitary forces - BSF- CRPF and CISF - NCC Organization and History - Aims and Objectives of NCC - Motto of NCC - DG's Four Cardinal Principles of NCC - NCC Song- Ranks in Army, Air force and Navy - Certificate Examination in NCC- Honours and Awards. **(6 Hours)**

UNIT II: MAP READING

Map and its features - kinds of north - Service protractor and Compass-bearing - Conversion of bearings - Conventional signs - Setting of map - Finding own position - Map to ground - Ground to map - Night March chart. **(6 Hours)**

UNIT III: HYGIENE AND SANITATION

Personal Hygiene - Sanitation - Methods of purification of drinking water -Latrine types - Urinal Types. **(6 Hours)**

UNIT IV: TYPES OF DISEASE AND POLLUTION

Define Health - Types of Health - Communicable and Non communicable Disease - Pollution and its type. **(6 Hours)**

UNIT V: FIRST AID

Aims of First Aid - Principle of First Aid - Motto of First Aid - List of items in First aid Box - Types of Bandages - Types of Fracture - Dislocation - Types of Wounds - Burns and Scalds - Sprain - Strain - Asphyxia - Drowning - Poison - Shock - Snake bite - Sun and Heat Stroke - Insect bite - Dog bite - Hanging - Artificial Respiration - Haemorrhage. **(6 Hours)**

BOOK FOR REFERENCE:

Mishra R.C., **A Handbook of NCC,** Kanti Prakashan, Etawah, 2000.

INTERNAL QUESTION PATTERN

Time: 2 hours **Marks: 30**

PART - A

Answer Any 4 out of five 4 x 2 = 8

PART- B

Two either or questions (one from each) 2 x 4 = 8

PART - C

Two either or questions (one from each 2 x 7 = 14

DEPARTMENT OF PHYSICAL EDUCATION

COURSE PATTERN

(PART V)

Sem.	Code	Title of the Paper	Hours	Credits
I & II	20STPPE01	Yoga and Rhythmic Activities	120	-
III & IV		Fundamentals of Physical Education	120	1
		Total	**240**	**1**

YOGA AND RHYTHMIC ACTIVITIES

Semester: I & II **Hours: 120**

Code : 20STPPE01

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	COGNITIVE LEVEL
1.	Recall the principle of Asnas	K
2.	Classify Pranayama for different needs	C
3.	Appraise the application and effects of Suryanamaskar for human wellness	An
4.	Execute the techniques in Free Hand Exercise	Ap
5.	Construct Pyramids based on the underlying principles	S

UNIT I: ASNAS

Sitting Postures - Standing Posture - Prone Posture - Supine Postures.

(24 hours)

UNIT II: PRANAYAMA

Pranayama - Suga Pranayama - Chandra bethana - Nadi Sudhi - Ujjayee - Seethali - Seethakari - Brahmari. **(24 hours)**

UNIT III: SURYANAMASKAR

Suryanamaskar: 12 Postures - 12 Postures & Breathe consioius - 12 Postures With manthra - Relaxation Techiniques. **(24 hours)**

UNIT IV: CALLISTHENICS (FREE HAND EXERCISE)

Standing series - Bending series - Sitting series - Twisting series - Dumb - bells - Indian Clubs - Lezium - Hoops. **(24 hours)**

UNIT V: AEROBICS & PYRAMIDS

Aerobics: Aerobic Basics - Aerobic Movements - Aerobic With Rhythm - Aerobic Programme Pyramids: Basics of Pyramids - Types of Pyramids. **(24 hours)**

BOOKS FOR REFERENCE:

1. Wuest Jeborah,A and Charles A. Bucher (1987), 'Foundation of Physical Education, B.I Publication Pvt.Ltd., New Delhi.
2. Elangovan.R, (2002), 'Utarkalvi Oru Arimugam', Ashwin Publication, Triunelveli.
3. Chandrasekaran.K, (1999), 'Sound Health through Yoga, Prem Kalyan Publication, Sedapatti.
4. Iyengar, B.K.S,'Lights on Yoga', Unwin Hyman Company, London

FUNDAMENTALS OF PHYSICAL EDUCATION

Semester: III & IV **Hours: 120**

Code : 20STPPE01 **Credits: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	COGNITIVE LEVEL
1.	Familiarize the fundamentals of Physical Education	K
2.	Illustrate different rules for different games and athletic events	C
3.	Examines the need for good nutrition	Ap
4.	Synthesis the relation between hygiene and health	S
5.	Apply the first aid techniques	Ap

UNIT I: PHYSICAL EDUCATION

Definition, need, scope, aims and objectives of physical education. **(24 hours)**

UNIT II: GAMES AND ATHLETEIC EVENTS

History of Games: Basketball, Volley Ball, Kho-Kho, Kabaddi, Badminton and Ball Badminton - Rules and regulation of the Games and Athletic Events. **(24 hours)**

UNIT III: NUTRITION

Balanced Diet, Daily Energy Requirement, Nutrient Balance, Nutrition Intake, Diet and Competition, Nutritional Tips, Your Ideal Weight. **(24 hours)**

UNIT IV: HEALTH EDUCATION

Meaning of health education, Definition of health education, Personal Hygiene, Communicable Diseases **(24 hours)**

UNIT V: FIRST AID

First Aid: Injuries to bones and Muscles, Sprain, Strain, Muscle Cramp and joints Dislocation and Fractures Snake-bite, Dog bite Poisoning, Artificial Respiration, (Drowning) **(24 hours)**

BOOKS FOR REFERENCE:

1. Sathyanesan, R.C., 'Hand Broken Physical Education, 'Gheena Publishers, Madurai.
2. Thirunarayanan,C and Hariharan,s, 'Analytical History of physical Education 'South India Press, Karaikudi.
3. St. John Ambulance Association, 'First Aid to the Injured' New Delhi.
4. Prabhakar Eric, (1995), 'The way to Atheletic Gold', Affliated East West Pvt. Ltd., New Delhi.

SCHEME OF EVALUATION

1.	Summative Examination (2 hours)	:	40 marks
2.	Continuous Internal Assessment	:	60 marks
	Total	**:**	**100 marks**

SCHEME OF EVALUATION FOR COTINUOUS INTERNAL ASSESSMENT

1.	Attendance (240 hrs)			:	20 marks
	❖ Theory Class	:	120 hrs		
	❖ Games	:	60 hrs		
	❖ Field Work	:	60 hrs		
2.	Performance in any one Game			:	10 marks
3.	Performance in any one of Athletic event			:	10 marks
4.	Performance in Yoga / Rhythmic activities			:	10 marks
5.	Assignment			:	10 marks
	Total			**:**	**60 marks**

QUESTION PATTERN FOR SUMMATIVE EXAMINATION

Total marks: 40 **Time: 2 hours**

SECTION - A

Answer All Questions (5x1=5)

(Choose the best Answer)

SECTION - B

Answer any four questions (4x2=8)

(Four question out of six)

SECTION - C

Answer any Four out of Six questions (4x5=20)

(Four question out of six)

SECTION - D

Answer any one question (1x7=7)

(One question out of two)

CERTIFICATE COURSE ON GANDHIAN THOUGHT

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
2.	Formulate hypothesis, design experiments, use appropriate tools and interpret the results.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
5.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities such as self-esteem, positive attitude, self-discipline and self-motivation.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Analyse the social, political, economic, cultural and religious conditions of the various dynasties of India, British India, Indian Constitution, Indian Administration and Indian Economy to acquire the special skill in the field of administration.	PO- 1, PO-2, PO-4
PSO - 2	Evaluate the History of World Civilizations and Europe in the world politics and compare the various types of constitution and the constitutional development in England.	PO- 1, PO-2
PSO - 3	Get knowledge on the principles of Economics, functions of banking system, development of Science and Technology, Tourism, the importance of Human Rights and equip with computer knowledge and applications for all competitive examinations.	PO- 1, PO-4, PO-5
PSO - 4	Recognize the sacrifice of the freedom fighters in the National Movement and picturize the traditional values in the right perception on Women Studies and Women Entrepreneurship.	PO- 1, PO- 5, PO- 6
PSO - 5	Participate in discussions by listening to others perspectives, asking productive questions, articulating original ideas, correspond efficiently with good vocabulary, realize the need of historical research and excel in General Studies for Competitive Examinations.	PO- 2, PO- 5, PO- 6

PAPER I: LIFE OF MAHATMA GANDHI - CCHYGT01

Code: CCHYGT01 **Hours: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on the Early Life of Mahatma Gandhi	PSO - 5	K
CO-2	Analyse the racial equality and Mahatma Gandhi's Experience in South Africa	PSO - 5	An
CO-3	Explain the role of Mahatma Gandhi in Indian Freedom Struggle	PSO - 2	Ap
CO-4	Assess the constructive works of Mahatma Gandhi in Indian Nationalism	PSO - 2	Ap
CO-5	Discuss the major Incidents from the Life of Mahatma Gandhi	PSO - 5	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code: CCHYGT01	PAPER I: LIFE OF MAHATMA GANDHI - CCHYGT01										Hours: 1 Credits: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNIT I

Family background and beginnings of the Mahatma - Birth and childhood - Education and family life - lessons learned - The London Experience

UNIT II

Making of the Mahatma: Gandhi in South Africa - From a barrister to a people's leader - Towards racial equality - From family life to ashram life - Birth of Satyagraha and constructive work - experiments with truth

UNIT III

Beginnings of Indian Freedom Struggle: Early resistances and 1857 Revolt - Birth of Indian National Congress: Moderates, Extremists and Terrorists - Gandhi leads the nation in a new direction - Early micro satyagrahas

UNIT IV

Mahatma Gandhi leads the Freedom struggle to victory: Major satyagrahas - Constructive Work - Sabarmathi and Sevagram - Various currents of Indian Nationalism - Towards partition and freedom - The final martyrdom

UNIT V

Video shows on Gandhi - Field and life experiences - Incidents from the life of Gandhi that inspired and shaped your life.

PAPER II: NON VIOLENCE AND SARVODAYA - CCHYGT02

Code: CCHYGT02 **Hours: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on Mahatma Gandhi's Non - violence	PSO - 5	As
CO-2	Discuss the Policies of Mahatma Gandhi on Truth and Action	PSO - 5	An
CO-3	Analyse Sarvodaya and Antyodaya	PSO - 5	K
CO-4	Assess the values introduced through Brahmacharya and Aparigraha	PSO - 5	Ap
CO-5	Relate violence and Truth in our day today life with the teachings of Gandhiji	PSO - 2	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code: CCHYGT02	**PAPER II: NON VIOLENCE AND SARVODAYA - CCHYGT02**											**Hours: 1** / **Credits: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNIT I

Meaning of Nonviolence (*ahimsa*): Nonkilling and noninjuring - Love, service and forgiving - Nonviolent Action: Peaceful resolution of conflict, nonviolent life style & constructive work and Satyagraha - Nonviolent values and ethics

UNIT II

Truth: Absolute and Relative - Moving beyond falsehood, errors and mistakes - Truth and pluralism - Truth and action - Truth and Nonviolence

UNIT III

Sarvodaya (welfare of all at all levels) and Antyodaya (welfare of the last first) - Means and Ends - Removal of untouchability - Communal Harmony - Uplift of Women

UNIT IV

Removal of poverty: Full & total appropriate employment - Self-dependence, Self - reliance, Swaraj and Swadeshi (love thy neighbour) - Self-control and Sublimation (*brahmacharya*) - Simple and Ethical living - *Aparigraha* (nonpossession) and Trusteeship (stewardship) - Appropriate and Holistic Science and Technology.

UNIT V

Place of Nonviolence and truth in our day to-day life and ways to enhance them - learn and practice three skills which would enhance your self-reliance and ability to help (serve) others in need - Resolve conflicts peacefully - Experience inter-religious relationships, dialogue and prayers.

RECOMMENDED BOOKS

PAPER I

Mahatma Gandhi	:	An Autobiography சத்திய சோதனை
R. Nanda	:	Mahatma Gandhi - A Biography
டி.டி. திருமலை	:	காந்தி
கல்கி	:	மாந்தருள் ஒரு தெய்வம்
திரு.வி.க.	:	காந்தியடிகளும் மனித வாழ்க்கையும்
ஜெயகாந்தன்	:	வாழ்விக்க வந்த காந்தி
J.B. Kriplani	:	Gandhi His Life and Thought
லூயி பிஷர்	:	மகாத்மா காந்தி
Louis Fischer	:	The Life of Mahatma Gandhi
பா. ஆனந்தி, மங்களவதி கேப்ரியல் & வி.ஏ. வித்யா	:	காந்திய சிந்தனை வினா-விடை (Gandhian Thought Quiz)
சி. பெரிதாய் & பா. ஆனந்தி	:	மகாத்மா காந்தியடிகளின் காலம்

PAPER II

M.K. Gandhi	:	Sarvodaya
————	:	Nonviolence in Peace and War (2 Vols)
————	:	Truth is God
Richard B. Gregg	:	Power of Nonviolence
மு. வசந்தா (பதி.)	:	சர்வோதயம்
R.R. Diwakar	:	The Saga of Satyagraha
ச. செயப்பிரகாசம்	:	அகிம்சை

COURSE BOOK:

மகாத்மா காந்தியின் வாழ்வும் அறவியலும் - டாக்டர் பா. ஆனந்தி & டாக்டர் ச. செயப்பிரகாசம்

Life and Values of Mahatma Gandhi - Dr. B. Ananthi & Dr. S. Jeyapragasam

தாள் I - மகாத்மா காந்தியின் வாழ்வு - CCHYGT01

Code: CCHYGT01 **Hours: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on the Early Life of Mahatma Gandhi	PSO - 5	K
CO-2	Analyse the racial equality and Mahatma Gandhi's Experience in South Africa	PSO - 5	An
CO-3	Explain the role of Mahatma Gandhi in Indian Freedom Struggle	PSO - 2	Ap
CO-4	Assess the constructive works of Mahatma Gandhi in Indian Nationalism	PSO - 2	Ap
CO-5	Discuss the major Incidents from the Life of Mahatma Gandhi	PSO - 5	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code: CCHYGT01				தாள் I - மகாத்மா காந்தியின் வாழ்வு - CCHYGT01								Hours: 1 Credits: 1
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

அலகு 1

குடும்ப பின்னணியும் மகாத்மாவின் தொடக்கமும் - பிறப்பும் குழந்தைப் பருவமும் - கல்வியும் குடும்ப வாழ்வும் - கற்ற பாடங்கள் - இலண்டன் அனுபவங்கள்.

அலகு 2

மகாத்மா உருவாகிறார் - தென்னாப்பிரிக்காவில் காந்தி - பாரிஸ்டரிலிருந்து மக்கள் தலைவராக - இன சமத்துவத்தை நோக்கி - குடும்ப வாழ்விலிருந்து ஆசிரம வாழ்வுக்கு - சத்தியாகிரகம் மற்றும் தீர்மானப்பணியின் தொடக்கம் - சத்திய பரிசோதனைகள்.

அலகு 3

இந்திய விடுதலைப் போராட்டத்தின் தொடக்கம் - ஆரம்ப கால எதிர்ப்புகளும் 1857 எழுச்சியும் - இந்திய தேசிய காங்கிரசின் தொடக்கம் - மிதவாதிகள், தீவிரவாதிகள் மற்றும் பயங்கரவாதிகள் - காந்தி நாட்டை புதிய திசையில் நடத்துகிறார் - ஆரம்ப வட்டார சத்தியாகிரங்கள்.

அலகு 4

மகாத்மா காந்தி இந்திய விடுதலைப் போராட்டத்தை தலைமையேற்று நடத்துகிறார் - தேசிய சத்தியாகிரங்கள் - நிர்மாணப் பணிகள் - சபர்மதியும் சேவாகிராமும் - இந்திய தேசியத்தின் பல்வேறு போக்குகள் - பிரிவினையும் விடுதலையும் - மகத்தான உயிர் தியாகம்.

அலகு 5

காந்தியைப் பற்றிய படங்கள் - கள மற்றும் வாழ்க்கை அனுபவங்கள் - உங்களது வாழ்வை பரவசப்படுத்திய, உருக்கிய மகாத்மா காந்தியின் வாழ்க்கை நிகழ்ச்சிகள்.

தாள் **II - அகிம்சையும் சர்வோதயமும் - CCHYGT02**

Code: CCHYGT02 **Hours: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on Mahatma Gandhi's Non - violence	PSO - 5	As
CO-2	Discuss the Policies of Mahatma Gandhi on Truth and Action	PSO - 5	An
CO-3	Analyse Sarvodaya and Antyodaya	PSO - 5	K
CO-4	Assess the values introduced through Brahmacharya and Aparigraha	PSO - 5	Ap
CO-5	Relate violence and Truth in our day today life with the teachings of Gandhiji	PSO - 2	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code: CCHYGT02	தாள் **II - அகிம்சையும் சர்வோதயமும் - CCHYGT02**										**Hours: 1** **Credits: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

அலகு 1

அகிம்சையின் பொருள் - கொல்லாமையும் துன்பம் செய்யாமையும் - அன்பு, தொண்டு மற்றும் மன்னித்தல் - அகிம்சைச் செயல்- அமைதி வழியில் சிக்கல் தீர்வு, அகிம்சை வாழ்வியலும் நிர்மாணப்பணியும், சத்தியாகிரகம் - அகிம்சை அறவியலும் விழுமியங்களும்.

அலகு 2

உண்மை : பேருண்மையும் (முழுமை உண்மையும்) சார்பு உண்மையும்- பொய்மைகள், தவறுகள் மற்றும் குற்றங்களுக்கு அப்பால் செல்லுதல் - உண்மையும் பன்மியமம் - உண்மையும் செயலும் - உண்மையும் அகிம்சையும்.

அலகு 3

சர்வோதயமும் (அனைவரின் நலம் அனைத்து நிலைகளிலும்) அந்தியோதயமும் (கடையவர் நலன் முதலில்) - குறிக்கோளும் வழிமுறையும் - தீண்டாமை நீக்கம் - சமூக ஒற்றுமை - மகளிர் முன்னேற்றம்.

அலகு 4

வறுமை நீக்கம் : முழுமையான ஏற்புடைய வேலை வாய்ப்பு - தற்சார்பும் தன்னிறைவும், சுயராஜ்ஜியம் மற்றும் சுதேசி (அயலவரை நேசி) - புலனடக்கமும் மேன்மையாக்கமும் (பிரம்மச்சரியம்) - எளிய மற்றும் அறவியல் வாழ்வு உடைமையின்மையும், அறங்காவலர் நெறியும் - ஏற்புடைய மற்றும் முழுமை அறிவியலும் தொழில் நுட்பமும்.

அலகு 5

நமது அன்றாட வாழ்வில் அகிம்சையும் உண்மையும் பெறுமிடமும் அதனை மேம்படுத்தும் வழிகளும் - உங்களது தற்சார்பையும் தேவையில் பிறருக்கு உதவும் ஆற்றலையும் வளர்க்கும் ஏதாவது மூன்று திறன்களைக் **(Skills)** கற்றல் - அமைதி வழியில் சிக்கல் தீர்வு அனுபவங்கள் - சர்வசமய நட்புறவு, உரையாடல் மற்றும் வழிபாட்டு அனுபவம் பெறல்.

DEPARTMENT OF HINDI

PART I - HINDI - COURSE PATTERN

Part	Sem.	Code	Title of the Paper	Hours	Credits
I	I	20GH1GS01	Paper - I - Prose, Short Story and Grammar- I	5	3
	II	20GH2GS02	Paper - II - Novel, One act Play, and Grammar - II	5	3
	III	20GH3GS03	Paper - III Poetry and History of Hindi Literature, Alankar	5	3
	IV	20GH4GS04	Paper IV - General Essay, Technical Hindi, Translation, and Letter Writing	5	3
		Total		**20**	**12**

TESTING AND EVALUATION

Course	Continuous Internal Assessment	Semester Examination
Hindi	40%	60%

Continuous Internal Assessment

Continuous Assessment will be carried out by the Course Teachers. The components of CIA are as follows:

Components	Marks
Test -I	30
Test -II	30
Seminar/Quiz	10
Assignment	05
Attendance	05
Total	***80**

* The total internal marks obtained for 80 will be converted into marks obtained for 40.

HINDI - EXTERNAL QUESTION PATTERN

Time: 3 Hours **Marls: 60**

Section A: (One Word / Sentence) 10 x 1 = 10 Marks

Section B: (Paragraph / Annotation) 4 x 5 = 20 Marks

Section C: (Essay) 3x 10 = 30 Marks

PAPER I - PROSE, SHORT STORY AND GRAMMAR - I

Semester: I **Hours: 5**

Code : 20GH1GS01 **Credits: 3**

1. Prose : Naveen Hindi Patamala Part-3

Published by Dakshina Bharathi Hindi Prachar Sabha,

Thyagaraya Nagar, Chennai - 600 017.

The following Lessons have been prescribed

a) Shiraj Ki Gurubhakthi

b) Shri Krishn

c) Gupth Rupya

d) Karmaveer Kamaraj

2. Short Story : Kahani Manjari

Edited by : Dakshin Bharath Hindi Prachar Sabha,

Thyagaraya Nagar, Chennai - 600 017.

The following short stories have been priscribed

a) Badegar kee beti	-	Premchand
b) Thayee	-	Vishwamranava Shrama Kaushik
c) Paanch minute	-	Mohanlalji Mahato yogi
d) Usne Kaha tha	-	Chandra dharshama Guleri

3. Grammar 1 : Vyakaran Pradeep Published by Ramdev, Hindi Bhaan,

63, Tagore Nagarm Allahabad -2

The following topics have been prescribed

a) Noun b) Gender and Number

c) Pronoun d) Adjectives

PAPER II - NOVEL, ONE ACT PLAY AND GRAMMAR - II

Semester: II **Hours: 5**

Code : 20GH2GS02 **Credits: 3**

1. **Novel** : Nirmala (Abridged version)
   by Premchand, Hamsa Prakashan Allahabad
2. **One Act Play** : Aadarsh Ekanki
   Published by Dakshina Bharath Hindi Prachar Sabha,
   Thyagaraya Nagar, Chennai - 600 017.
   The following Ekankies have been prescribed
   a) Doosra din - Kanchanlatha sabbarval
   b) Rajpoothri Ka badla - Divjendralal Rai
3. **Grammar** : Ramdev, Published by Hindi Bhavan,
   63 Tagore Nagar, Allahabad - 2
   The following topics have been prescribed
   a) Verb
   b) Tense and Voice
   c) Adverb
   d) Prepositions
   e) Conjunctions
   f) Interjunctions

PAPER III - POETRY AND HISTORY OF HINDI LITERATURE, ALANKAR

Semester: III **Hours: 5**

Code : 20GH3GS03 **Credits: 3**

1. POETRY:

Kavya Saurab Published by Dakshina Bharatha Hindi Prachar Sabha, T. Nagar, Chennai - 600 017.

The following poems have been prescribed

1. Sachche Devtha - Ayodhya Singh Upadhyay Harioudh
2. Murjhaphool
3. Vivshtha
4. Badal - Sumitranandan Panth
5. Vasanth Aayaa
6. Deep Koi jal raha hai
7. Kabir Ke Dohe - 5 numbers
8. Tulasi Ke Dohe - 5 numbers
9. Raheem Ke Dohe - 5 numbers
10. Bihari Ke Dohe - 5 numbers

2. HISTORY OF HINDI LITERATURE:

Hindi Sahitya Ka Ithas by Rajanath Sharma Vinod Pushhak Mandir, Agra - 2

The following topics have been prescribed Salient features of Aadikl Bakthikal (Gyan marg, Premmag, Rambakthi, Krishnabakthi and Reethika.

Short Notes from Adunikkal**:** Chayavad, Pragathivad, Mythili Sharan, Gupta, Dinkar Premchand Pant Prasad, Ramachandra Shukla

3. ALANKAR:

Ras chand Alankar Chandrika Karnataka Mahila Hindi Seva Samithi, Chamarajpet, Bangalore - 560 008. The following Alankars have been prescribed Anupras, Yamak, Vakrokthi, Upama, Virodabhas.

PAPER - IV - GENERAL ESSAY, TECHNICAL HINDI, TRANSLATION AND LETTER WRITING

Semester: IV **Hours: 5**

Code : 20GH4GS04 **Credits: 3**

1. General Essay:

Nibandh Praveshika, Dakshin Bharath Hindi Prachar Sabha T.Nagar, Chennai - 600 017

The following Sahityotar (General) essay have been prescribed

a. Anushashan
b. Parishram Ka Mahatva
c. Paropkar
d. Bharat Ki Kalatmak Ekta
e. Nari Ka Karthavye Aur Adhikaar

2. Translation: Anuvad Abyas - III (1-5 Lessons) English to Hindi, Hindi to English Published by Dakshina Bharath Hindi Prachar Sabha T.Nagar, Chennai - 600 017.

3. Technical Hindi: Karyalaya Sahayika, Kendriya Sachivalaya Hindi Parishad NewDelhi, Hindi Vathayan Dr. K. Chandra Mohan, Viswa Vidyalaya Prakashan Varanashi

Banking Terms : 50 only

Nemikaryalaya Tippani : 50 only

Name of the Ministries : 33 only

4. Letter Writing: Pramanik Alekan Aur Tippan Prof Viraj M.A. Kashmirgate, Delhi - 110 006

PaariVarik Patra, Avedan Patra, Sampathak ke naam Patra, Padhadhikariyon ke naam Patra

PG AND RESEARCH CENTER OF CHEMISTRY

U.G. PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
2.	Formulate hypothesis, design experiments, use appropriate tools and interpret the results.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
5.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities such as self-esteem, positive attitude, self-discipline, and self-motivation.

U.G. PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Apply knowledge in various aspects of chemistry in fields such as organic, inorganic, physical, analytical, spectral, biochemical and environment	PO-1, PO-2
2.	Exhibit problem solving skills and analytical skills	PO-2, PO-3
3.	Realize the values of chemistry in our daily life and discharge knowledge and skills as analyst in small scale industries, cottage industries and quality control sectors	PO-5, PO-6
4.	Pursue higher education in the field of chemistry and in different horizon of life	PO-4, PO-5
5.	Fix their feet and brighten their career in the field of chemistry for sustainable future and face emerging opportunities and challenges	PO-1, PO-4, PO-6

CERTIFICATE COURSE

IT SKILLS FOR CHEMISTS

Semester: Non Semester **Hours: 2**

Code : 20CH1SD01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Draw chemical structures with chem draw tools	PSO-2	K, Ap
CO-2	Apply the knowledge of chem draw in report writing	PSO-3	Ap, An
CO-3	Equip the skills in origin software	PSO-3	Ap, An
CO-4	Interpret spectral data using origin software	PSO-5	Ap, An, S
CO-5	Gain knowledge on the informatics methods to solve chemical problems	PSO-2,3	K, Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: Non Semester	**CERTIFICATE COURSE IT SKILLS FOR CHEMISTS**											**Hours: 2**
Code : 20CH1SD01												**Credits: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	2	3	3	4	3	4	5	3	4	5	3.63
CO - 2	4	3	5	4	3	4	5	4	4	3	4	3.90
CO - 3	3	4	4	5	3	2	4	3	5	3	4	3.63
CO - 4	4	3	5	4	2	3	5	3	4	3	5	3.72
CO - 5	4	3	4	5	3	3	5	4	3	4	5	3.90
Overall Mean Score												**3.74**

Result: The Score for this Course is 3.74 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I: CHEM DRAWI:

Introduction - definition - modes – main tools – analysis window – chemical properties window - panels in drawing - chemical structures - drawing tools and objects - templates – conversion of name to structure and vice versa

(12 Hours)

UNIT II: CHEM DRAWII:

Significance of chem draw - role of chem draw in chemistry - chem sketch practices: benzene, DDT, BHC, glucose, sucrose, enantiomers, 18- annulene – writing equations - chem sketch - 3D - drawing chemical structure - pasting them in text - saving files as images **(12 Hours)**

UNIT III: ORIGIN:

Introduction – file: new - open – save project – edit: copy – paste – import: single ASCII – graphical plot : line, symbol, line+symbol – column bars – multicurve - export graph – windows: workbook **(12 Hours)**

UNIT IV: DATA ANALYSIS USING ORIGIN:

Format menu – analysis - linear and non linear graphs - UV – Visible spectral data – FT-IR spectral data- fitting linear graph for first order rate constant: ester hydrolysis – fitting non-linear graph for conductometric titrations. **(12 Hours)**

UNIT V CHEMINFORMATICS:

Cheminformatics: History, Representing molecules: older systems - connection tables, line notation - Inchi, SMILES, WLN canonicalization. Line notation versus connection tables. Query languages - SMARTS. Nomenclature: IUPAC names, trade names, common names. Molecular similarity: Ways to measure similarity - 2D topology, 3D configuration, Physical properties, clustering. Chemical registration system Chemistry softwares **(12 Hours)**

BOOKS FOR REFERENCE:

1. Polanski, J. (2009). Chemoinformatics. Poland: Elsevier Publications.
2. **Chem draw Ultra 12.0 and OriginPro 9.0**

CERTIFICATE COURSE IN "IT SKILLS FOR CHEMISTS"

TESTING AND EVALUATION OF CERTIFICATE COURSE

DISTRIBUTION OF MARKS

Internal: 40 marks

The component for internal exam is at the discretion of the department.

Test I : 20 marks

Test II : 20 marks

Average of Two Tests : 20 marks

Practical : 20 marks

Internal : 40 marks

External : 60 marks

QUESTION PATTERN (Blue Print of External Question Paper)

(External at the end of II semester and credits will be awarded)

Time: 3 hours **Max. Marks: 60**

Section	Types of Question	Number of Qns	Number of Qns to be answered	Marks for each Qn	Total
A Q.No(1-10)	Fill ups -5 qns (one from each unit) Multiple choice qns - 5 qns (one from each unit)	10	10	1	10
B Q.No(11-15)	Should contain qns from all five units	5	4	5	20
C Q.No(16-20)	Should contain qns from all five units (not exceeding 2 qns from the same unit)	5	3	10	30

DIPLOMA IN MODERN COSMETICS

Paper: I - CHEMISTRY OF MODERN COSMETICS

Semester: Non Semester (I & II) **Hours: 4**

Code : DCCHMC01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Discuss the chemistry of cosmetics and different modes of application	PSO-1, PSO-2	K, Ap
CO-2	Aware of the chemical aspect of cosmetics	PSO-3	E, An
CO-3	Apply relevant theoretical perspectives to practical application	PSO-3	Ap, An
CO-4	Apply the indepth knowledge about the cosmetics and its applications in real life context	PSO-4	Ap, An, S
CO-5	Brighten their career as beautician and utilize the opportunities	PSO-5	Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I and II				CHEMISTRY OF MODERN COSMETICS								Hours: 4
Code : DCCHMC01												Credits: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	4	4	3	3	4	4	3	4	4	3	3.54
CO - 2	4	3	3	3	3	4	3	3	3	4	3	3.27
CO - 3	4	4	3	4	4	4	3	4	3	4	4	3.72
CO - 4	3	3	3	4	4	4	3	3	4	4	3	3.45
CO - 5	3	4	4	4	3	4	3	4	3	5	4	3.45
Overall Mean Score												3.48

Result: The Score for this Course is 3.48 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

CHEMISTRY OFCOSMETICS:

Definition- history of cosmetics – cosmetic formulation – skin care – hair care – deodorants and antiperspirants – colour cosmetics: mascara, eye shadow - eyebrow pencils – sun protection – aerosols – nail cosmetics - mouth cosmetics–perfumesandfragrances **(12 Hours)**

UNIT II

COSMETICS FOR THE SKIN-I:

Powders: Face powder: discussion of these properties – raw materials used – manufacturing methods – properties - formulae: light base with ZnO and white base with heavy powders

Creams: General considerations - classification – raw materials – cold – cleansing – all purpose creams - formulae of creams: lubricating – night-skin protective and hand creams – vanishing and foundation – liquid creams: cream oil base, finished cream formulae **(12 Hours)**

UNIT III

COSMETICS FOR THE SKIN-II:

Lotions: Classification – difference from liquid creams and gums – mucilage making – astringents, antiseptics and preservatives – clarification- hand lotions: varieties – increased uses – formulae- skin toning lotion – skin fresheners: definition and functions – formulae-medicated lotions: limitations - Deodorants: general consideration – bath and bathing preparation **(12 Hours)**

UNIT IV

COSMETICS FOR HAIR AND SHAVING MEDIA:

Shampoos: Anatomy of the hair and scalp –function – formulation – sulfonation – soapless, soap and cream shampoos. Shaving media: brushless shaving creams – raw materials - formulae – shaving soaps – shaving powder formulae - cosmetics for the nails – enamels or polishes – manicure–formulae **(12 Hours)**

UNIT V

COSMETICS FOR TEETH AND MOUTH:

Dentifrices and Mouth Washes: general consideration – importance of packages – claims – raw materials – abrasives – sweeteners – flavors – foaming agents – liquid addition – colloidal binding agents - formulae – defectsincosmetics-suggestionsforcorrection **(12 Hours)**

BOOKS FOR REFERENCE:

1. E. G. Thomssen, Modern Cosmetics, Universal publishing corporation Bombay, Reprinted in India, 1985.
2. Kirpal Singh, Chemistry in Daily Life, PHI Learning Private Limited, New Delhi, 3rd edition, 2012.

Paper: II - HANDLING COSMETICS – Lab

Semester: Non semester **Hours: 4**
Code : DCCHMCP1 **Credits: 2**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Demonstrate the different types of cosmetics	PSO-2	K, Ap
CO-2	Equip their skills and creativities	PSO-3	Ap, An
CO-3	apply the techniques as a beautician	PSO-3	Ap, An
CO-4	Focus their carrier advancement	PSO-3, PSO-5	Ap, An, S
CO-5	Inculcate business ethics	PSO-5	K, Ap

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: Non Semester	HANDLING COSMETICS – Lab											Hours: 4
Code : DCCHMCP1												Credits: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	4	4	4	5	4	3	4	3	4	4	4	3.90
CO - 2	4	3	3	3	4	4	4	3	4	4	4	3.63
CO - 3	4	5	4	4	4	4	4	4	4	4	4	4.09
CO - 4	4	4	5	4	4	4	5	4	4	4	4	4.18
CO - 5	4	4	4	4	4	4	4	3	4	3	4	3.81
Overall Mean Score												3.92

Result: The Score for this Course is 3.92 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos = Total of Mean Scores / Total No. of Cos

1. **Introduction class**
    - Skin types
    - Threading
    - Face safety
2. **Manicure**
    - skin type
    - Pedicure
    - Pedicure skin type
    - waxing
3. **Hair cutting**
    - Baby cutting
    - Women cutting
    - Hair straightening
    - Hair curling
    - Head massage
    - Hair do
4. **Mehandi**
    - Mehandi types
5. **Nail shape**
6. **Skin bleaching**
    - Skin type
    - Facial and types
7. **Saree models**
8. **Bridal make up**

DIPLOMA COURSE (Non Semester) -Evaluation

CHEMISTRY OF MODERN COSMETICS

Code: DCCHMC01

Internal	External	Total
40	60	100

CIA Components

Component		Marks
Test - I	:	30
Test - II	:	30
Assignment	:	05
Quiz/Seminar	:	10
Attendance	:	05
Total	**:**	**80**

The total internal marks obtained for 80 will be converted into marks obtained for 40

HANDLING COSMETICS-LAB (Internal Only)

Code: DCCHMCP1

CIA Components for Internal Assessment

Component		Marks
Component- I (Threading)	:	20
Component- II (Hair Cutting)	:	20
Component- III (Mehandi)	:	20
Component- IV (Saree draping)	:	20
Component- V (Bridal make up)	:	20
Total	**:**	**100**

Blue print of question paper (External)

Time: 3 hours **Max. Marks: 60**

PART	Types of Question	Number of Qns.	Number of Qns. to be answered	Marks for each Qn.	Total
A Q. No (1-5)	one question from each unit	5	5	2	**10**
B Q. No (6-10)	either / or type. - one question from each unit	5	5	4	**20**
C Q. No (11-15)	Open choice – One question from each unit	5	3	10	**30**