

NATIONAL COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI – 1
B.Sc. (GEOLOGY) –SCHEME AND SYLLABUS – CBCS SYSTEM

(Applicable to the candidates admitted from the academic year 2013-2014 onwards)

Semester	Part	Course Title	Title	Instr. Hours/ week	Credit	Exam Hours	Marks			Total	
							Int	Ext			
								Oral	W		
I	I	Language Course-I (LC - I)		6	3	3	25		75	100	
	II	English Language Course-I (ELC-I)		6	3	3	25		75	100	
	III		Core Course – I (CC-I)	Dynamic Geology	5	5	3	25		75	100
			Core Course – II (CC-II)	Practical I – Structural Geology and Surveying	3	-	-	-		-	-
			First Allied Course-I (1AC-I)	Allied Mathematics I / Allied Chemistry I	5	3	3	25		75	100
			First Allied Course – II (1AC-II)	Allied Mathematics II / Allied Chemistry Practical	3	-	-	-		-	-
	IV	Skill Based Elective-I (SBE-I)	Office Automation	2	2	3	25		75	100	
		Total		30	16					500	
II	I	Language Course-II (LC-II)		6	3	3	25		75	100	
	II	English Language Course – II (ELC-II)		4	2	3	25		75	100	
		Communicative English – III (ELC-III)		2	1	3	25	5	70	100	
		Core Course – II (CC-II)	Practical I – Structural Geology and Surveying	3	5	3	25	5	70	100	
	III		Core Course – III (CC-III)	Structural Geology	5	5	3	25		75	100
			First Allied Course – II (1AC-II)	Allied Mathematics II / Allied Chemistry Practical	3	3	3	25	5	70	100
			First Allied Course – III (1AC-III)	Allied Mathematics III / Allied Chemistry II	5	3	3	25		75	100
	IV	Environmental Studies		2	2	3	25		75	100	
		Total		30	24					800	
III	I	Language Course – III (LC-III)		6	3	3	25		75	100	
	II	English Language Course-IV(ELC-IV)		4	2	3	25		75	100	
		Communicative English – V (ELC-V)		2	1	3	25	5	70	100	
	III		Core Course – IV (CC-IV)	Physical Geology	5	5	3	25		75	100
			Core Course – V (CC-V)	Practical II – Paleontology and Crystallography	2	-	-	-		-	-
			Second Allied Course-I (2AC-I)	Allied Physics I	5	3	3	25		75	100
			Second Allied Course – II (2AC-II)	Allied Physics Practical	2	-	-	-		-	-
	IV		Skill Based Elective Course II – (SBEC-II)	Desktop Publishing	2	2	3	25		75	100
			Skill Based Elective Course III – (SBEC-III)	Office Automation & Desktop publishing Lab	2	2	3	25		75	100
		Total		30	18					700	

IV	I	Language Course – IV (LC-IV)		6	3	3	25		75	100		
	II	English Language Course–IV(ELC-IV)		6	3	3	25		75	100		
	III	Core Course – V (CC-V)	Practical II – Paleontology and Crystallography		3	5	3	25		75	100	
		Core Course – VI (CC-VI)	Paleontology		5	5	3	25		75	100	
		Second Allied Course – II (2AC-II)	Allied Physics Practical		3	3	3	25	5	70	100	
		Second Allied Course – III (2AC-III)	Allied Physics II		5	3	3	25		75	100	
	IV	Non Major Elective Course–I (NMEC-I)	Elements of geology		2	2	3	25		75	100	
		Total		30	24					800		
V	III	Core Course – VII (CC-VII)	Crystallography & Optical Mineralogy		5	5	3	25		75	100	
		Core Course – VIII (CC-VIII)	Descriptive Mineralogy		5	5	3	25		75	100	
		Elective Course – I (EC-I)	Stratigraphy		5	4	3	25		75	100	
			Exploration Geology(optional)									
		Elective Course–II (EC-II)	Remote Sensing & Mining Geology		4	4	3	25		75	100	
			Engineering Geology(optional)									
		Core Course – IX (CC-IX)	Practical III – Mineralogy		2	-	-	-		-	-	
	Core Course – X (CC-X)	Practical IV - Petrology and Economic Geology		3	-	-	-		-	-		
IV	Non Major Elective Course –II (NMEC-II)	Geology & Environment		2	2	3	25		75	100		
		Value Education Course – VEC		2	2	3	25		75	100		
		Soft skills		2	2	3	25		75	100		
		Total		30	24					700		
VI	III	Core Course – IX (CC-IX)	Practical III – Mineralogy		3	5	3	25		75	100	
		Core Course – X (CC-X)	Practical IV - Petrology and Economic Geology		3	5	3	25		75	100	
		Core Course – XI (CC-XI)	Igneous Petrology		6	6	3	25		75	100	
		Core Course – XII (CC-XII)	Sedimentary & Metamorphic Petrology		6	6	3	25		75	100	
		Core Course – XIII (CC-XIII)	Economic Geology		6	6	3	25		75	100	
		Elective Course– III (EC-III)	Hydrogeology & Environmental Geology Economic Geology		5	4	3	25		75	100	
			Fuel Geology (optional)									
		Gender Studies		1	1	3	25		75	100		
		Total		30	33					700		
V	Extension Activities		--	1	--	--	--	--	--	--		
		Total		180	140					4200		

There will be oral test for all practical exams & Communicative English Course. The oral test will carry 5 marks in the external component.

nraAs; (, ffhy , yffpak) > ci uei l > rWfi j > , yffpa tuyhW > gadKi wj j kp; - U13T1

gUtk; : l

ghl k; : l

fwgffk; fhyk; : 6

j ugGssp : 3

myF - 1:

ghuj pahu; ftpi j fs; :] u] ;tj p Nj tpaed; Gfo;
ghuj ehL
ghuj gj hrd; ftpi j fs; : j kppd; , dpi k
, dgj j kp>
c yfk; c dDi l aJ > nfhl L KuNr
gl LfNfhl j l ahu; ftpi j fs; : ci ogGk; Nj i t
, td; NrhW NghLfwhd > mtd; \$W NghLfwhd;
ehkff; ftq; ghl yfs; : , sej kpDfF
fz z j hrd; ftpi j fs; : ghLtJ ehdy

myF - 2:

mgJy; uFkhd; : kz ;
i tuKj J : ghuj p epi df;fggLfwhd;
Nkj j h : nrUgGl d; xU Ngl b
kèh : Ntfk > j kpggwW > Ruz l ykhk?>
rptgGehl h > fhj Nyh fhj y > goffk; nghyyhj J
, dFyhg; : xU Gddi fr; rkpf; fahy;
mKj ghuj p : i ` f;\$
ehl LgGwg; ghl yfs; : xgghug; ghl y; - grpahwg; Nghtj pyi y

myF - 3: ci uei l:

ghuj pahu; - j pahdqfS k; kej µqfS k;
j pU.tpf. - kdj d;
c.Nt.rh - vJ j kp?
uh.gp NrJggps; s - FbAk; gi l Ak;
K.t. - nkhop , yyhj epi y
GJi kggj j d; - j kph; ehfupfj j py;

fphkthofj f

fy;fp - Gi dfspd; Nti y epWj j k;
rpvd; mz z hJ i u - gwW
R[hj h - fl Ts; , Uf;fwhuh?

myF - 4: rWfi j:

tpay; fhyk; - Ki dtu; , uh.ghyRgukz pad;

myF - 5:

, yffp̄a tuyhW

- , Ugj hk; E}wwhz Ł
(Gj p̄dk> ehl fk; eb;fyhf)

gad;Ki wj j k̄p;

- typk̄Fk; t̄j p̄fs̄p̄d; nj hFgG
k̄p̄fhi k̄f;Fupa t̄j p̄fs̄;
(eyy j k̄p; vOj Ntz Łkh
gf;260 - 290.

ghl E}y;

1. nraAs> c i uei l

- fy;Y}up nts̄p̄aL

2. r̄p̄Wfi j

- t̄p̄bay;fhyk>

Ki dtu; , uh. ghyRgukz p̄ad;

3. , yffp̄a tuyhW

- nghJ

4. gad;Ki wj j k̄p;

- eyyj k̄p; vOj Ntz Łkh>

m.f̄p̄ guej hk̄dhu> gf;260-290

nraAs; (, i l f;fhy , yffp̄ak> Gj p̄dk> , yffp̄a tuyhW

nraAs;U13T2

gUtk;: ll

ghl k; : ll

fwp̄fFk; fhyk; : 6

j ugGss̄p : 3

myF - 1

1.1 j p̄UQhdkgej u; Nj thuk; j p̄UfNfhb;f;fh j p̄Uj j yk; (11 ghl y;fs) , d;W..

1.2. j p̄UehTf;furu; Nj thuk; j p̄UgGfY}u; j p̄Uj j yk; (10 ghl y;fs) kUsth..

1.3. Rej u; Nj thuk; j p̄Uthi df;fh j p̄Uj j yk; (10 ghl y;fs); ki wfs;..

1.4. khz p̄f;f;thrfu; j p̄Uthrfk; - j p̄Untkghi t (10 ghl y;fs) Mj p̄Ak;..

myF - 2

2.1. Mz łhs; j p̄Ugghi t (10 ghRuq;fs) Xq;fp̄

2.2. nj hz ł ubgnghbaho;thu; j p̄Ukhi y (10 ghRuq;fs) gri r

2.3. j p̄Ugghz ho;thu;mk;yd;hj p̄p̄uhd; (10 ghRuq;fs)

2.4. FyNrfuho;thu;ngUkhs; j p̄Unkhop (11 ghRuq;fs) CNdW

myF - 3

3.1. - Kj ;J f;Fkhurhkp̄ ḡp̄si sj j k̄p; (2 ghl y;fs)

3.2. - eej p̄f;fykgfk; - 5 ghl y;fs;

3.3. - Kf;\$l wgs;S - 5 ghl y;fs;

3.4. - xsi tahu; ghl y;fs; - 4 ghl y;fs;

3.5. - fhsNkfgGyt; ghl y;fs; - 3 ghl y;fs;

3.6. - rfj p̄Kj j gGyt; ghl y; - 1 ghl y;

3.7. - fkgu; ghl y;fs; - 3 ghl y;fs;

myF - 4

Gj pdk;- rKj ha tj p - eh. ghuj j rhuj p

myF - 5

5.1. , yffpa tuyhW

5.1.1. - gfj p , yffpak; [i rtk> i tz tk]

5.1.2.- rpwpyffpak; [gpsi sj j kp> fykgfk>gsS

5.1.3 -Gj pd , yffpak;

fhggpak> ehl fk> , yffpa tuyhW-U13T3

gUtk; : III

ghl k; : III

fwgpfFk; fhyk; : 6

j ugGssp : 3

myF - 1

1. rpyggj pfhuk; (, sqNfhtbfs) - tofFi u fhi j

2. kz pNkfi y (rj j i yrrhj j dhu)- Mj pi u gpi rapl l fhi j

myF - 2

3. fkguhkhaz k; (fkgu) - , uhkhtj huk; - fhl rpggl yk;

4. ngupaGuhz k; (Nrf;fphu)- Gryhu; ehadhu; Guhz k;

myF - 3

5. , NaRfhtpak; (fz z j hrd) - ki ygnghopT

6. rlvhgGuhz k; (c kWgGytu) - khDfFg; gpi z epdw gl yk;

myF - 4 :

7. j z z B; j z z B; (Nfhky; Rthkphj d)- ehl fk;

myF - 5

8. , yffpatuyhW - fhggpak> Guhz k> ehl fk;

gz j l , yffpak> , yffpa tuyhW> nkhoggawrp -U13T4

gUtk; : IV

ghl k; : IV

fwgpfFk; fhyk; : 6

j ugGssp : 3

myF - 1

1. FWenj hi f - 10 ghl yfs; (8>18>25>40>58>99>131>135>167>196)

2. ewwpi z - 5 ghl yfs; (1> 3> 16> 30> 355)

3. l qFE}W - 10 ghl yfs; (nryT mOqFtj j ggj J)

myF - 2

4. fyj nj hi f - 2 ghl yfs; (FwpQrpf;fyf15> Kyi yf;fyf11)

5. mfehD}W - 2 ghl yfs; (129> 140)

6. GwehD}W - 10 ghl yfs; (95>165>182>183>184>188>194>195>204)

myF - 3

7. j pUfFws; - mwj Jgghy; 5 mj pfhuqfS; (11> 13> 14> 43> 47)

myF - 4

8. gj Jgghl L- Kyi ygghl L KOtJk; (egGj dhu)

myF - 5

, yffpa tuyhW-vl Lj nj hi f> gj Jgghl L> gj ndz ; fbffz fF> nkhoggapwrp - nghJ ffl Li u (nghJ mwT> ehl Lel gG> rKj ha NehfF gwpad)

ENGLISH FOR COMMUNICATION – U13E1

Semester: I

English Language Course: I

Instruction Hours/Week: 6

Credit: 3

- Unit I :** 1.Civilization and History – C.E.M. Joad
2. The Fun They Had – Issac Asimov
- Unit II :** 3. Big Numbers and Infinities – George Gamow
4. Oil – G.C. Thornley
- Unit III:** 5. An Observation and An Explanation – Desmond Morris
6. A Robot about the House – M.W.Thring
- Unit IV:** 7.A Wrong Man in Worker’s Paradise – Rabindranath Tagore
8. Making Surgery Safe – Horace Shipp
- Unit V:** 9. Using Land Wisely – L.Dudley Stam
10. The Karuburator – Karel Capek

Text Book: English through Reading, by W.W.S.Baskar and N.S.Prabu, Published by Macmillan Publishers India Ltd.,

ENGLISH THROUGH EXTENSIVE READING - U13E2

Semester : II

English Language Course : II

Instruction Hours/Week:4

Credit: 2

Unit I

- R.K.Narayan An Astrologer’s Day
- Boman Desai Between the Mosque and the Temple

Unit II

- O.Henry The Gift Of the Magi
- Premchand The Child

Unit III

- R.P. Sisodia The Last Salvation
- Kasturi Sreenivasan I Prepare to gotoCoimbatore

COMMUNICATIVE ENGLISH II – U13CE2

Semester : III

Communicative English Course : II

Instruction Hours/Week:2

Credit: 1

Unit-I:

Enriching Vocabulary – Register Development; who is who; Synonyms, antonyms, Active and Passive vocabulary, proverbs

Unit –II:

Tense Forms with emphasis on differences between Present and Present Continuous; Past and Present Perfect – Framing questions, Auxiliaries, if clauses; conjunctions, and linkers; Prepositions

Unit –III

Pronunciation, Good Pronunciation habits, R.P., Greetings, Farewells commands etc.,

Unit –IV:

Conversational Skills – Affirmative or Negative Language – idiomatic expressions, Phrases, Dialogue Writing,

Unit –V:

Writing Skills – Note- taking, note- making, e-mail- Describing an object- narrating a story

Reference Books

- i) A Practical English Grammar by A.J Thomson and A.V. Martinet.
- ii) Remedial English Grammar, by F.T. Wood.
- iii) English for competitive Examinations by R.P Bhatnagar & Rajul Bhargava.

READING POETRY AND DRAMA– U13E4

Semester : IV

English Language Course: IV

Instruction Hours/Week:6

Credit: 3

POETRY:

Unit: I	John Milton	:	On His Blindness
	Oliver Goldsmith	:	The village Schoolmaster
	William Wordsworth	:	The Solitary Reaper
UNIT II	P.B.Shelley: Ozymandias		
	John Keats	:	La Belle Dame Sans Merci
	Browning	:	Incident of the French Camp
UNITIII	John Masfield	:	Laugh and Be Merry
	Robert Frost	:	Stopping By the Woods On a Snow Evening
	John Drink water	:	The Vagabond

of plate tectonics – Different kinds of plate margins – Evidences in favor and against the concepts of Continental Drift and Plate Tectonics; Introduction to Mid Oceanic Ridges, Submarine trenches and Transform faults.

Unit V:

Mountains: Classifications – Life cycle of mountains – Origin of mountains. Geosynclines: Stille’s, Kay’s, Strahler’s and Schuchert’s Classifications; Types of plateaus and plains. Causes, effects and evidences of Sea level changes.

TEXT BOOKS:

1. Arthur Holmes Principles of physical Geology: Thomas Nelson & sons London.
2. Philip G. Worcester A textbook of geomorphology: D. Van Nostrand co., London.
3. Radhakrishanan. V .General Geology - V.V.P. Press.
4. Mahapatra, G.B. A text book of Geology - CBS, Delhi
5. Patwardhan, A.M. The Dynamic Earth System - PHI Learning PVT. Ltd, New Delhi

REFERENCE BOOKS:

1. William J. Miller -Principles of physical Geology - Thomas Nelson & sons , London.
2. W. D. Thornbury A text book of geomorphology - D. Van Nostrand co., London.
3. A.L. Bloom General Geology - V.V.P. Press.
4. L.D. Leet & Judson Physical Geology - Prentice Hall, India.
5. Edger W. Spencer Earth Science -Mc Graw Hill, New Delhi

PRACTICAL I – STRUCTURAL GEOLOGY AND SURVEYING – U13GY2P

Semester : I & II
Instruction Hours/Week : 3+3

Core Course : II
Credit : 5

Structural Geology:

Contour maps and their interpretation. Exercises to predict trends of the outcrop of Horizontal, vertical an incline beds with respect to topography – reading of solid conformable maps – deciphering dip and strike of outcrops – construction of map when three points over a bedding plane are given construction of vertical sections order of super – position – vertical thickness of formations.

Reading of solid fold and fault maps construction of vertical sections – Determination of throw of vertical faults. Reading of unconformable solid maps – construction of sections. Reading of solid maps of areas when more than one structure is involved – determination of comparative ages of structures ad intrusions – geological history.

Structural Problems – problems relating to true dip and apparent dip; Determination of vertical and true thickness.

Description of features in Survey of India's (SOI) toposheet: Extramarginal, marginal, intramarginal information, major conventional signs and symbols, physical and socio-cultural features

SURVEYING:-

Chain survey – prismatic compass survey – plane table survey – leveling. Clinometer Compass and Brunton Compass:-To find out dip and strike of the beds. GPS:-Fundamentals and applications.

STRUCTURAL GEOLOGY - U13GY3

Semester : II

Core Course : III

Instruction Hours/Week : 5

Credit : 5

Unit I:

Scope and Aims of Structural Geology – Methods of representing physiographic features - Contours – Topographic and Geological maps, their preparation and uses. Physical properties of rocks: Deformation – brittleness, plastic and elastic properties. Beds and their attitudes – Dip and strike – Tends of outcrop – Rule of V of outcrops – Relation between true and apparent dips. Width of outcrops, True thickness, vertical thickness and their mutual relations.

Unit II:

Primary and secondary structures – primary structures of extrusive and intrusive igneous rocks – primary structures of sedimentary rocks.

Plutons – concordant and discordant plutons – dyke, sill, phacolith, lopolith, batholiths, ring dykes and cone sheets – brief study of salt domes.

Unit III:

Folds – geometry and elements of folded surface – classification – descriptive study of different types of folds – recognition of folds in the field and on map.

Unconformities – definition – types – significance – recognition in the field and on map – overlap and off lap; Inlier and Outlier.

Unit IV:

Faults – definition – terminology – genetic and geometric classification and description – recognition of faults in the field and on the map – distinction between faults and unconformities – a short account of rift valleys. Joints – definition – geometric and genetic – classification – descriptive study – applications of joints.

Unit V:

Foliation – Primary and secondary foliations; Cleavage and Schistosity – Types and Origin of Rock Cleavages. Lineation – Kinds and Origin of lineation; Mechanism and Uses of Clinometer and Brunton compass.

TEXT BOOKS:

- 1. M.P.Billings : Structural Geology: Prentice Hall, Englewood Clifts, U.S.A.
- 2. C.M. Novin : Principles of structural Geology John Willey, New York.
- 3. Gokhale, N.W. : Theory of Structural Geology. CBS Publishers.
- 4. Ghosh. S.K. : Structural Geology – Fundamentals and Modern developments. – Pergamon Press.

REFEREANCE BOOKS:

- 1. V.V. Belousov - Structurral Geolgy – Moscow
- 2. P.C. Bedgley - Structural and Tectonic, Principles: Harper & Row, New york.
- 3. E.W. Spencer - An Introduction to structural Geology: Mc Graw Hill, New York.
- 4. Park, P.G. - Fundamentals of structural Geology, John Willey & sons,

PHYSICAL GEOLOGY - U13GY4

Semester : III

Core Course : IV

Instruction Hours/Week : 5

Credit : 5

Unit I:

Weathering of Rocks – Environment of weathering – weathering processes, chemical and mechanical weathering – Rates of weathering – kinds and products of weathering, – weather & climate – Role of weathering in Geologic cycle, Economic importance of weathering.

Atmosphere – Its composition and zones. Movements of atmosphere – wind – Geological actions of wind- sand dunes and their types – loess – arid cycle of erosion – characteristics of deserts.

Unit II:

Running water – source and surface flow – erosion, transportation and deposition – land reforms resulting from erosion and deposition – valley development – drainage patterns – fluvial cycle (youth maturity and old age) – interruptions to the normal cycle – stream rejuvenation – river capture.

Unit III:

Underground water – sources – water table – zone of saturation – springs and wells – artesian wells – geysers – spring deposits – aquifer – geological work of ground water – solution – Karst

topography – development of karst features – characteristics of Karst regions – origin of L.St. caverns – artesian belts of Tamilnadu.

Unit IV:

Glaciers – origin and types of glaciers – movement of glaciers – transportation and deposition – glacio fluvial deposits – landforms produced by glaciers – Ice ages. Lakes – classification – types of lakes – lake deposits.

Unit V:

Seas and Oceans – waves, tides and currents– sea as a geological agent – classification of shore lines – shore line types – description of continental margin – continental shelf – continental slope – ocean basin – submarine canyon, sea mount , guyot, mid oceanic ridge; ocean deposits; coral reef - their types and origin.

TEXT BOOKS:

1. Philip G.Worcester : A text book of Geomorphology – D. Nostrandcomp Inc. New York.
2. Radhakrishnan.V, 1996 : General Geology, VVP, Tuticorin.
3. Mahapatra, G.b. A text book of Geology, CBS, Delhi
4. Arthur Holms : Principles physical Geology Thomos Nelson & sons, London
5. Chakranarayanan,A.B. et.al:Concepts of Geology, Scientifica Publication

REFERENCE BOOKS

1. D.Leet & Shelton Judson: Physical Geology – prentice Hall, Internation Inc. Englewood, Cliff, U.S.A.
2. William J, Miller : An introduction to physical Geology, D. Van Nostrand Company, Inc New York.

PRACTICAL II : PALAEOLOGY AND CRYSTALLOGRAPHY - U13GY5P

Semester : III & IV

Core Course : V

Instruction Hours/Week : 2+3

Credit : 5

PALAEOLOGY

Megascopic identification and description of the following fossils:- Corals: Calceola, Zaphrenits, Favosites, Halysites,; Brachiopoda: Spirifer, Productus, Terebratula, Rhyconella, Atrypa, Athyris, Orthis, Echinodermata: Pentrimites, Cidaris, Hemicidaris, Micraster, Holaster, Hemisaster, Stygmatoptygus, Mollusca: Pelecypoda: - Arca, Cardium, Meretrix, Cardita, Pecten, Trigonia, Megaladon, Pholodomya, Gryphea, Exogyra, Ostrea, Inoceramus, Alectryonia. Gasteropoda:- Natica,

Turbo, Trochus, Turritella, Cerethium, Conus, Voluta, Murex, Fusus, Physa, Bellerophon. Cephalopoda:- Nautilus, Goniatites, Ceratites, Acanthoceras, Scholenbachia, Perispinctus, Hamites, Scaphites, Baculites, Turrillites and Belemnites, Arthropoda: Trilobita:- Paradoxides, Calymene, Phacops. Trinucleus, Graptolites: - Phyllograptus, Tetragraptus, Didymograptus, Diplograptus, Monograptus, Plant fossils:- Glossopteris, Gangamopteris, Ptillophyllum, Lepidodendron, Sigillaria and Calamites.

MICRO FOSSILS:-

Lagena, Nodosaria, Textularia, Operculina, Elphidium, Ammonia.

DIAGRAMS:-

Paradoxides, Pentremites, Trigonina, Arca, Meretrix, Murex, Turritella, Nautilus, Spirifer.

CRYSTAL MODELS

Identification and description of the following crystal models:-

Galena, Garnet, Fluorite, Pyrite, Tetrahedrite, Boracite, Sphalerite, Cuprite, Zircon, Cassiterite, Rutile, Octahedrite, Apophyllite, Vesuvianite, Scheelite, Meonite, Wulfenite, Chalcopyrite, Beryl, Zincite, Apatite, Calcite, Haematite, Dolomite, Corundum, Tourmaline, Phenacite, Diopside, Quartz, Olivine, Topaz, Barite, Andalusite, Cordierite, Sulphur, Staurolite, Hypersthene, Calamine, Struvite, Epsomite, Gypsum, Orthoclase, Augite, Hornblende, Epidote, Sphene, Axinite, Albite, Kyanite and Rhodonite.

SIMPLE TWIN MODELS:-

Galena, Fluorite, Pyrite, Rutile, Calcite, Quartz, Staurolite, Gypsum, Augite, Orthoclase, Albite.

PALAEONTOLOGY - U13GY6

Semester: IV

Core Course : VI

Instruction Hours/Week : 5

Credit : 5

Unit I: Definition of Palaeontology – organic world- Animal Kingdom – classification of animals – Habitates and Habits of animals. Definition of fossils – nature and modes of preservation of fossils: Body fossils and; Unaltered hard parts, Altered hard parts : Petrification , permineralisation , carbonisation, recrystallisation, silicification; trace fossils- mould, casts, tracks , trails, borings; Uses of fossils – stratigraphic indicators – climatic indicators- indicators of palaeogeography – indicators of evolution and migration of life forms – indicators of new deposits of coal and petroleum – life through ages.

Unit II:

Phylum Arthropoda:- Class – Trilobita- General morphology : classification – geological history. Phylum Porifera – A short account of sponges. Phylum coelentrata – class Anthozoa – zoological features – General morphology : classification – tabulate corals – Rugose corals geological distribution – stratigraphic importance. Sub phylum Hemichordata – class Graptozoa: order Dendroidea and Graptoloidea – general morphology, classification , geological distribution and stratigraphic importance.

Unit III:

Phylum Mollusca: Class Pelecypoda - General characters – ornamentation , classification , geological history. Class Gasteropoda:- General morphology , shell forms – types of coiling – Dextral and sinistral – ornamentation , classification and geological history. Class Cephalopoda:- General morphology , (Nautilitic , Goniotitic , Ceratitic and Ammonitic) – shell forms – ornamentation – classification, geological history- morphology of a Belemnite shell.

Unit IV:

Phylum Brachiopoda:- General morphology – Brachial skeleton – morphometric details, ornamentation , classification , geological history. Phylum Echinodermata: Class Echinoidea: General morphology, corona (Ambulacra, inter ambulacra) – peristome – regular and irregular echinoids – classification– geological history. Class Crinoidea:- General morphology , classification, geological history. Class Blastoidea: General morphology.

Unit V:

Phylum protozoa – Order,; Foraminifera: General morphology – dimorphism – classification , geological history and stratigraphic importance. Class Crustacea:- Sub class: Ostracoda – morphology – classification and geological history.

A brief outline of the classification of vertebrates. A short account of Devonian fishes, Mesozoic Reptiles, Siwalik mammals. General classification of plant kingdom – plant fossils from India – A brief account of the following plant fossils :- Glossopteris , Gangamopteris , Ptilophyllum , Calamites , Lepididendron and Sigillaria. Applications of Micro palaeontology.

TEXT BOOKS:

1. Henry woods : Invertebrate palaeontology – Cambridge.
2. Romer , A.S. : Vertebrate palaeontology, Chicago press.
3. Arnold, C.A., : An introduction to Palaeobotany., MC-Graw Hill.

4. B.U. Hag and A. Boersma (1978) : Introduction to marine Micropalaeontology. Elsevier, Netherlands
5. Jain, P.C., and Anatharaman, M.S., : An introduction to Paleontology, Vishal Publications.

REFERENCE BOOKS

1. Raup, D.M. and Stanely, M.S. : Principles of Palaeontology, CBS Publishers.
2. Moore , R.C., Laliker , C.G.& Fishcher, A.G.: Invertebrate Fossils , Harper brothers
3. Shrock. R.R. and Twenhofel , W.H – 1953 : Principles of invertebrate Palaeontology, Amold publication
4. Easton - Invertebrate Paleontology

CRYSTALLOGRAPHY & OPTICAL MINERALOGY - U13GY7

Semester: V

Core Course : VII

Instruction Hours/Week : 5

Credit : 5

Unit I:

Definition of crystal – morphological characters of crystal – faces –forms – edges solid angles – Interfacial angle. Contact Goniometer and its uses. Symmetry elements – crystallographic axes – crystal notation – parameter system of Weiss and Miller indices – axial ratio – laws of crystallography – the law of constancy of symmetry , the law of constancy of interfacial angles and the law of rational indices. Classification of crystals into systems and classes - Holohedral , Hemihedral, Hemimorphic and Enantiomorphic forms in crystals. Elementary knowledge of spherical and stereographic projections. study of the symmetry elements, and forms of the Normal, pyritohedral , tetrahedral and plagiohedral classes of cubic system with special reference to well developed crystals of Galena Spinel , Garnet, Flourite , Diamond , Pyrite , Tetrahedrite , Boracite and cuprite.

Unit II:

Study of symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Pyramidal Hemimorphic, Sphenoidal and Trapezohedral classes of Tetragonal system with special reference to well developed crystals of zircon, Rutile, Cassiterite, Vesuvianite, Apophyllite, Shellite, Melonite, Wulfenite and Chalcopyrite.

Study of the symmetry elements and forms of Normal, Hemimorphic Tripyramidal, pyramidal Hemimorphic, Trapezohedral, Rhombohedral , Rhombohedral Hemimorphic , Trirhomboidal and Trapezohedral classes of Hexagonal system with special reference to well defeloped crystals of Beryl , Zincite, Apatite , Calcite , Corundum , Tourmaline, Phenacite and Quartz. Study of the symmetry

elements and forms of the Normal , Hemimorphic and Sphenoidal classes of Orthorhombic system with special reference to well developed crystals of Barite , olivine topaz, staurolite, Sulphur, Calamine, Struvite and Epsomite.

Unit III:

Study of the symmetry elements and forms of the Normal classes of the Monoclinic and Triclinic systems with special reference to well developed crystals of Gypsum, Orthoclase, Albite, Augite, Axinite and Kyanite. Twin crystals – Definitions – Effects of Twinning – laws of twinning – composition plane, twinning plane and twinning axis, indices of twins – simple and repeated (polysynthetic twins), contact and penetration twins: secondary twins. Study of twin laws pertaining to the following crystals – Fluorite (spinel law), Pyrite (iron crosss twin). Rutile (geniculate), Calcite, Quartz (Brazil law), Aragonite (mimetic twin), Staurolite (cruciform), Gypsum, Augite and Feldspars (Carlsbad, Baveno , Manebach, Albite and Pericline).

Unit IV:

Nature of light – Ordinary and polarized light – Refraction and reflection. Refractive index, Critical angle and Total internal reflection. Double refraction - Plane polarization by Reflection, Brewster's law - Plane polarization by Refraction, Nicol Prism - Plane polarization by absorption, Polaroid. Petrological microscope and its parts – Optical accessories, their construction and uses – Quartz wedge (Determination of order of Interference Colour), – Gypsum plate and Mica plate (Determination of Fast and Slow vibration directions), and Berek Compensator (Determination of Birefringence)

Unit V:

Optical classification of minerals. Optical properties of isotropic and anisotropic minerals observed under parallel and crossed Nicols. Differences between Isotropic and anisotropic minerals. Definition of extinction, Types of extinction, Extinction angles and their determination, and uses – Characters of Uniaxial and biaxial minerals – Optics axis and optic axial angle – Acute and Obtuse Bisectrix – Optic sign of Uniaxial and Biaxial minerals – Uniaxial and Biaxial Indicatrix - Sign of elongation - Optical anomalies.

TEXT BOOKS:-

1. Dana, F.S.(1955) : A text book of mineralogy - Asia Publishing House - Willey.
2. Wade., F.A. & Mattox, R.B. : Elements of crystallography and mineralogy, Harper Bros.(1960)
3. Phillips, P.C (1956) : An introduction to crystallography Longmans green & co.,

4. Kerr.P.F : Optical Mineralogy.

REFERENCE BOOKS:-

1. Phillips, W.R. : Optical Mineralogy, Griffen, D.T.1986.
2. Walhstrom, E.F.1960 : Optical crystallography – John wiley.
3. Winchel, A.n. 1968 : Elements of optical mineralogy, part 1 & 2 wiley Eastern.
4. Smith H.G. : Miinearls under microscopy – Murby.

DESCRIPTIVE MINERALOGY - U13GY8

Semester: V

Core Course : VIII

Instruction Hours/Week :5

Credit : 5

Unit I:

Definition of Mineral and Mineraloid – Scope and aim of Mineralogy. Chemical elements and periodic Table - Bonding of atoms – Metallic, Covalent, Ionic and Van der Walls Bonding in Minerals, Structure and classification of silicates. Isomorphism, Polymorphism and Pseudomorphism in minerals. Physical properties of minerals depending upon cohesion and elasticity, hardness, specific gravity, light, heat, electricity, magnetism and the senses. Determination of specific gravity of minerals- Joly balance and Beam balance methods. Simple blow pipe tests.

Unit II:

Mineralogy, Structure, Chemistry, Optical and Physical properties, Modes of occurrences and industrial uses of the following groups of minerals: Polymorph and varieties of Quartz –Alkali and Plagioclase group of Feldspars – Nepheline and Sodalite group of Feldspathoides - and Zeolites.

Unit III:

Mineralogy, Structure, Chemistry, Optical and Physical properties, Modes of occurrences and industrial uses of the following group of minerals: Pyroxenes, Amphiboles, Micas, Olivine and Garnet.

Unit IV:

Physical and optical properties, chemical composition, uses and modes of occurrence of the following minerals: Epidote, Chlorite, Scapolite, Cordierite, Talc, Serpentine, Steatite, Calcite, Dolomite, Andalusite, Kyanite, Sillimanite, Topaz, Staurolite, Beryl, Tourmaline, Fluorite, Apatite, Zircon, Rutile, Sphene and Corundum.

Unit V:

Mineralogy, mode of occurrence, uses and distribution in India of the minerals required for the following industries: Abrasives, Fertilizer, Paint, Refractory, Glass, Ceramic and Cement. Mineral wealth of Tamil Nadu.

TEXT BOOKS:

1. Dana, F.S. 1955 – A text book of mineralogy – Asia publishing House, Wiley.
2. Read, H.H- 1974, - Rutley's elements of mineralogy – Thomas murby & co.
3. Mason ., B and Berry, L.G - Elements of Mineralogy – W.H. Freeman & Co.

REFERENCE BOOKS:

1. Deer. W.A.,Howie. R.A and Zuessman, J. -1966 .An introduction of the Rock forming minerals. Longmans.
2. Berry, L.G and Mason, B - 2000- Mineralogy, CBS Publishers and distributors.
3. Cornelis Klen and Cornelius S. Hurlbut , 1985 – Manual of Minerology, John wiley & Sons

STRATIGRAPHY - U13GY9E

Semester : V

Elective Course : I

Instruction Hours/Week : 5

Credit : 4

Unit I:

Principles of stratigraphy: law of order of superposition. law of uniformitarianism and law of faunal succession. Correlation: fossiliferous and unfossiliferous rocks. Standard stratigraphic scale and Indian Geologic Time scale. Imperfections in Geological record. Geological divisions. Stratigraphic classification and Nomenclature. Stratigraphic Units: Homotaxis. Physiographic divisions of India: Peninsular India, Indogangetic alluvial plains, Extra Peninsular India

Unit II:

Precambrian Stratigraphy: Archaeans of Dharwar Province, Archaeans of Eastern Ghat - The Sausar and Sakoli Series, Archaeans of Singhbhum – Iron Ore Series and Gangpur Series. Archaeans of Tamilnadu, Mineral Wealth of Archaeans of India, The Eparchaeon Unconformity, Stratigraphy and Mineral Wealth of Cuddapahs, Stratigraphy and Mineral Wealth of Vindhyan, Kurnool group, Life during Precambrian

Unit III:

Paleozoic Stratigraphy: Distribution of Paleozoic rocks in India, Cambrian of Salt Range, Age of Saline Series, Upper Carboniferous and Permian rocks of Salt Range, Paleozoic rocks of Kashmir Valley, Paleozoic rocks of Spiti Valley, Paleozoic rocks of Peninsular India,

Unit IV:

Mesozoic Stratigraphy: The Depositional Environment-distribution-life-classification and economic importance of Gondwana formations of India, Coastal Gondwana of India, Gondwana formations of Tamilnadu, Triassic of Spiti – The Lilang System, Jurassic of Kutch, Cretaceous of

Tiruchirapalli – Pondicherry – Bagh Beds, Deccan traps : distribution , structure , Lameta beds – infratrapean and intertrapean beds, age of the Deccan traps.

Unit V:

Cenozoic Stratigraphy: Comprehensive account of the geological events took place during Cenozoic era in India, rise of Himalayas, stratigraphy of Siwalik system, fauna and flora of Siwaliks, Tertiary rocks of Assam, Karewa formation, Tertiary rocks of Tamilnadu, Tertiary rocks of Kerala, Pleistocene Glaciation - Mineral wealth of Tertiary rocks of India:

TEXTBOOKS:

- 1. Krishnan M.S. (2003) - Geology of India and Burma, 6th Edition, CBS.
- 2. Wadia D.N. (1953) – Geology of India, TATA McGraw – Hill.
- 3. Ravindrakumar K.R. - Stratigraphy of India.
- 4. Lemon R.Y (1990) - Principles of Stratigraphy, Merrill Publishing Co.

REFERENCE BOOKS:-

- 1. Pascoe, E.H.(1968) - A manual of the Geology India and Burma, Govt of India Publications.
- 2. Gregory , J.W. and Barret B.H- General stratigraphy Mathuen.

EXPLORATION GEOLOGY (Optional) - U13GY9E

Semester : V

Elective Course : I

Instruction Hours/Week : 5

Credit : 4

Unit I:

Geological Exploration: Criteria controlling the choice of sites for geological prospecting- Marginal information of topo sheets and study of field equipments. Guides to ore search:- Mineralogical, structural, stratigraphical and geomorphological. Sampling methods:- channel sampling, bulk sampling and dump sampling. Field documentation and basic field procedures:-Pitting, trenching, drilling and exploratory mining.

Unit II:

Geochemical Exploration: Introduction – General principle: geochemical dispersion; geochemical anomaly; background and threshold values; recognition of anomaly; bedrock and soil geochemical surveys. Application of geochemistry in Mineral exploration. Outline of bio-geochemical, litho-geochemical and hydro-geochemical exploration.

Unit III:

Geophysical Exploration: A concise account of limitations and applications of various geophysical exploration methods. The principles involved, instruments used, field procedures adopted and interpretations applied in electrical resistivity methods. Types of electrode arrangement. A brief study of electrical well logging techniques.

Unit IV:

Gravity method: The earth’s gravitational field. Gravity corrections. The gravity measuring instruments. Density of rocks and the methods of density measurements. A short account on gravity exploration for minerals – Gravimeter. Magnetic method: Basic concepts and principles of magnetic prospecting. Magnetism of the earth and palaeomagnetism. Instruments employed in magnetic prospecting. Magnetometer – A short account of field procedures for **mineral exploration**.

Unit V:

Seismic methods: Types of seismic waves, their propagation and characteristics. Geophones, types of shooting methods, seismic energy source. Principle of refraction – interpretation of - horizontal two layer, multilayer and dipping layers. Principle of reflection seismic survey. Radioactive method: Principles of radioactive prospecting. Radioactive decay, radioactivity of rocks and minerals. Instruments, field procedure and interpretations employed in radioactive survey.

Text Books:

1. Mathur S.M. (2001) – Guide to Field Geology: Prentice Hall of India.
2. Ramachandra Rao M.B.(1975) – Outlines of Geophysical Prospecting - English Book Depot, Dehradun.
3. Dobrin M.B.(1981) Introduction to Geophysical prospecting. McGraw – Hill International Book Company.
4. Kearey.P and Brooks.M (1984) An Introduction to Geophysical Exploration- ELBS.
5. Hawkes H.E. and Webb. U.S - (1962) - Geochemistry in mineral Exploration. Harer & Row.
6. Mason.B (1966); Principles of Geochemistry – Willey Toppan.
7. Robinson. E.S. and Coruh.C. (2002)- Basic Exploration Geophysics– John Wiley.

REMOTE SENSING AND MINING GEOLOGY - U13GY10E

Semester : V
Instruction Hours/Week : 4

Elective Course : II
Credit : 4

Remote Sensing
Unit I:

Introduction to Remote Sensing: Definition of Remote sensing - processes and elements involved in electromagnetic remote sensing of earth resources – Electromagnetic spectrum and its

components – Atmospheric windows – Energy interaction in the atmosphere – Energy interactions with earth surface features – Spectral reflectance curves of water, vegetation and soil – Data acquisition and interpretation – Ideal and real remote sensing system – An outline of remote sensing applications.

Unit II:

Photogeology: Types of aerial photographs – Scale in aerial photographs and causes for its variation – Flight planning procedures – Mosaic and its types – Stereoscopy and stereoscopes – Outline of vertical exaggeration and parallax – Principles of photointerpretation – Annotation of aerial photographs – Application of aerial photographs in lithological and structural mapping, and mineral exploration.

Unit III:

Satellite Remote Sensing: Types of satellites – Scanning systems and detectors – Sensor resolutions: spatial, spectral, radiometric and temporal – Sensor characteristics of Landsat, Spot and IRS and high resolution satellites – Satellite image interpretation: visual and digital interpretation techniques and an outline of digital image processing techniques – Applications of satellite remote sensing.

Mining Geology:

Unit IV:

Role of geology in mining industries – definition of mining terms, shaft, Hanging wall, Adit, roof, Drive crosscut, Tunnel, Raise, Winze, Stope – Types; Surface methods of mining, Alluvial mining – pan & betea, sluicing, Hydraulicking, Dredging. opencast mining. Benches, Explosives, working slope, mining equipments – Dragline, power showels.

Unit V:

Subsurface mining :- Underground mining - advantages and limitations. Stopping – open stopes, supported stopes, pillar supported stopes – square supported stopping – timber supported stopes-filled stopes – shrinkage stopes – shaft sinking. Caving; Top slicing. Sublevel caving and Block caving. Coal mining (surface mining) Strip mining and Augering. Underground mining. Room and pillar method – Longwall method- hydraulicking. Mineral Economics and its concept. Role of Minerals in National Economy. Problems peculiar to Mineral Industry, strategic, critical and Essential Minerals. Mineral conservation and substitution.

Text Books

1. Curran, P (1988). Principles of remote sensing. Corgman Publishers, London
2. Lillesand, T.M and R.W. Kiefer (2000). Remote sensing and image interpretation. John Wiley & Sons, New York
3. Miller, V.C (1961). Photogeology. McGraw-Hill Publishers, New York
4. Pandey, S.N (1987). Principles and applications of photogeology. Wiley Eastern Ltd., New Delhi
5. Sabins, F.F (1987). Remote sensing principles and interpretation. Freeman Publishers, New York
6. Siegal, B.S and R. Gillespie (1980). Remote sensing in Geology, John Wiley & Sons, New York
7. Arogyaswamy, R.N.P. Courses in Mining Geology – Oxford & IBH, New Delhi.
8. Thamus, P.J. 1979 An introduction to mining, Methun.
9. Mc Kinstry, H.E 1960 Mining Geology, New York.

Reference Books

1. Allum, J.A.E (1978). Photogeology and regional mapping, Pergamon Press Ltd., Oxford
2. Anji Reddy, M (2001). Textbook of remote sensing and GIS, BSP PS Publications, New Delhi
3. Rampal, K.K (1999). Handbook of aerial photography and interpretation. Concept Publishers Company, New Delhi
4. Jean Yves Scanvic (1997). Aerospatial remote sensing in geology. Oxford & IBH Publishers Co. Pvt. Ltd.
5. Agarwal, C.S and Garg, P.K (2000). Textbook on remote sensing in natural resources monitoring and management, Wheeler Publishing Company Ltd., New Delhi
6. Narayan, L.R.A (1999). Remote sensing and its application. Universities Press Ltd., Hyderabad.

ENGINEERING GEOLOGY (optional) - U13GY10E

Semester : V

Instruction Hours/Week : 4

Elective Course : II

Credit : 4

Unit I

Engineering Geology and its applications. Scope of Engineering Geology. Engineering properties and characteristics of soils. Engineering performance of rocks – Strength and Elastic properties. Properties of building stones.

Unit II

Geological investigations pertaining to the foundation of buildings, Highways and harbors.

Unit III

Dams and their types. Geological investigations of Dam sites. Problems affecting Dam and remedial measures. Reservoir problems.

Unit IV

Geological investigations preceding tunneling. Problems relating to tunneling in hard and soft grounds. Soil erosion.

Unit V

Landslides- their classification. Geological investigations pertaining to coastal zone protection.

Text Books

1. Bell, F. G. 1983 Fundamentals of Engineering Geology, B. S. Publications, Hyderabad.
2. Gokhale, K. V. G. K. 2005 Principles of Engineering Geology, B. S. Publications, Hyderabad.
3. Legget, R. F. 1962 Geology and Engineering, McGraw Hill.
4. Parbin Singh 2008 (8th Ed.) Engineering and General Geology, Kataria & Sons, New Delhi.
5. Sathya Narayanaswami, B.S.2000 Engineering Geology, Dhanpat Rai & Co. Pvt. Ltd., Delhi.

Reference Books

1. Blyth, F. C. 1979 Geology for Engineers, ELBS.
2. Fox, C. S. 1949 Engineering Geology, New York.
3. Ries, H. and Watson, T. L. 1948 (5th Ed.) Engineering Geology, John Willey & Sons Inc.

PRACTICAL III –MINERALOGY - U13GY11P

Semester : V & VI

Core Course : IX

Instruction Hours/Week : 2+3

Credit : 5

MEGASCOPIC MINERALOGY:

Megascopic identification and description of the following: Quartz, Rosy quartz, Amethyst, Chalcedony, Agate, Flint, Jasper, Chert, Opal, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wollastonite, Anthophyllite, Tremolite, Actinolite, Hornblende, Glaucofane, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Chlorite, Epidote, Garnet, Olivine, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Dolomite, Tourmaline, Zircon, Fluorite.

MICROSCOPIC MINERALOGY:-

Microscopic identification and Description of the following:-

Quartz, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Enstatite, Hypersthene, Glaucofane, Biotite, Muscovite, Olivine, Epidote, Garnet, Apatite, Zircon, Spene, Tourmaline, Calcite, Andalusite, Kyanite, Sillimanite, Staurolite, and Cordierite

BLOW PIPE:-

Identification of the following mineral powders by simple blow pipe tests:-

Apatite, Barite, Calcite, Celestite, Cerusite, chalcopyrite, Galena, Gypsum, Chromite, Haematite, Magnesite, Magnetite, Psilomelane, Pyrolusite, Siderite, Sphalerite, Strontianite, Witherite, Stibnite, Ilmenite and Wulframite.

PRACTICAL IV –PETROLOGY AND ECONOMIC GEOLOGY - U13GY12P

Semester : V & VI

Core Course : X

Instruction Hours/Week : 3+3

Credit : 5

PETROLOGY:

Megascopic identification of the following rocks:

Granite, Graphic granite, Pegmatite, Aplite, Schorl Rock, Granite Porphyry, Syenite, Syenite porphyry, Diorite, Gabbro, Anorthosite, Dunite, Pyroxenite, Dolerite, Dolerite Porphyry, Basalt, Trachyte, Rhyolite, Obsidian, Pumice, Scoria. Conglomerate, Breccia, Sandstone, Arkose, Shale, Limestone, Laterite, Peat, Lignite, Slate, Phyllite, Schists, Gneisses, Quartzite, Marble, Amphibolite, Eclogite, Leptynite, Charnockite, Khondalite, and Basic Granulite.

Microscopic identification and description of the following rocks:-

Mica Granite, Hornblende Granite, Tourmaline Granite, Schorl Rock, Aplite, Graphic Granite, Mica Syenite, Hornblende Syenite, Nepheline Syenite, Diorite, Gabbro, Norite, Dunite, Peridotite, Granite – porphyry. Syenite – porphyry, Diorite – porphyry, dolerite, minette, Vogasite, Anorthosite, Trachyte, Andesite, Basalt, Phonolite, Volcanic Breccia, Vitrophyre, Conglomerate, Breccia, Sandstone, Arkose, Shale Limestone, Slate, Chlorite Schist, Mica Schist, Kyanite Schist, Staurolite Schist, Garnetiferous Schist, Glaucofane Schist, Granulite, Charnockite, Eclogite Amphibolite, Leptynite, Khondalite, Cordierite, Gneiss, Garnet – Sillimanite Gneiss, Calc Granulite.

ECONOMIC GEOLOGY:-

Megascopic identification and description, Indian occurrences and uses of the following ore and industrial Minerals: -

Realgar, Orpiment, Stibnite, Molybdenite, Galena, Sphalerite, Cinnabar, Covelite, Bornite, Chalcophyrite, Pyrite, Arsenopyrite, Marcasite, Barite, Celestite, Gypsum, Cuprite, Zincite, Corundum, Hematite, Ilmenite, Magnetite, Chromite, Franklinite, Cassiterite, Rutile,

Pyrolusite, Psilomelane, Goethite, Limonite, Bauxite, Calcite, Dolomite, Magnesite, Siderite, Aragonite, Witherite, Strontionite, Cerussite, Azurite, Malachite, Chrysocolla, Columbite, Halite, Fluorite, Phosphatic Nodule, Monazite, Graphite, Coal and its varieties.

IGNEOUS PETROLOGY – U13GY13

Semester : VI

Core Course : XI

Instruction Hours/Week : 6

Credit : 6

Unit I: Definition of Petrology – Earth zones, Composition and constitution of magmas, Primary and Parental Magmas.

Forms of intrusive igneous rocks: Concordant forms - Sill, Laccolith, Lopolith and Phacolith, Discordant forms - Dykes, Cone Sheets, Volcanic neck, Ring dyke, Batholiths, Stocks, Bosses and Bsymaliths.

Forms of extrusive igneous rocks: Lava flows, Pyroclastic deposits - Agglomerate, Lapilli, volcanic ash and volcanic froth

Unit II: Structures: Vesicular and Amygdaloidal structures – Block lava – Ropy lava – Pillow structure – Flow structure – Sheet joints- Mural jointing – Columnar jointing – Rift and Grain. Textures: Definition and description - crystallinity: crystallites and microlites – Devitrification – Granularity – shapes of crystals, mutual relations. Equigranular textures: Panidiomorphic, Hypidiomorphic, Allotriomorphic. Inequigranular textures: Intergrowth texture, Directive textures, Overgrowth textures, Reaction textures. Micro Structures.

Unit III:Classifications: Bases of classification – classification based on colour index – Based on silica saturation – Based on silica contents – Based on Feldspar molecules – Based on alumina saturation –CIPW Normative Classification – IUGS Modal Classification for Plutonic and Volcanic rocks – Tyrrell's tabular classification.

Unit IV:Petrography: Texture, Mineralogy, Classification, and Modes of occurrence: Granite, Granodiorite, Syenite, Diorite, Gabbro – Their hypabyssal and volcanic equivalents. Classification, Petrographic characters, origin and distribution in Tamilnadu of the following rocks: Pegmatite, Lamprophyre, Dunite and Anorthosite.

Unit V: Petrogenesis: Crystallization of Unicomponent magma – Crystallization and petrogenetic significance of Binary magmas: Diopside – Anorthite Eutectic system, Albite – Anorthite Solid-Solution system, Forsterite – Silica incongruent melting system. Reaction principle and Bowen’s reaction series - Magmatic Differentiation: Fractional Crystallization, Liquid Immiscibility and Assimilation - Variation diagrams and Petrographic Provinces.

TEXT BOOKS:-

1. Tyrrell, G.W. (1978) : The principles of petrology – Chapman and Hall Ltd., London.
2. Bowen, N.L.(1954): The Evolution of the Igneous Rocks – Dover publication, Inc, New York.
3. Barth, FW. (1962): Theoretical petrology - Wiley.
4. Whalstrom, E.E. (1961) : Theoretical Igneous petrology, Wiley.
5. Hatch, F.H. Wells, AK (1949): Petrology of Igneous Rocks, Thomas Murby & Wells, M.K.
6. Johannesen, A (1962) : Descriptive petrography of Igneous Rocks, Vols. I to IV - Allied Publishers
7. Turner.F.J and Verhoogen.J –1960.: Igneous and Metamorphic petrology – McGraw Hill.

REFERENCE BOOKS:-

1. Middlemost. A.K (1985) – Magmas and Magmatic Rocks – Longman.
2. McBirney. A.R (1994) –Igneous Petrology–CBS Publ and Distributors.
3. Raymond.L.A (2002) – Petrology – McGraw Hill.
4. Hall- A (1992) – Igneous Petrology – ELBS.
6. Shand –S.H (1949) – Eruptive Rocks.
7. Morse.S.A (1980) – Basalts and Phase diagrams, Springer – Verlag.
8. Winter. J.D (2001) – Igneous and Meta Petrology, Prentice Hall.

SEDIMENTARY & METAMORPHIC PETROLOGY - U13GY14

Semester : VI **Core Course : XII**
Instruction Hours/Week : 6 **Credit : 6**

Unit I: Sedimentary process – disintegration & decomposition of rocks – transportation – deposition – diagenesis. A broad classification of sedimentary rocks into residual mechanical, chemical and organic Groups. Structures of sedimentary rocks. mechanical, chemical and organic structures. Textures of sedimentary rocks – clastic and non – clastic textures.

Unit II: Residual deposits – terra rossa , clay, laterite and bauxite and soils. Mechanical deposits – rudaceous, arenaceous and argillaceous groups. Heavy minerals in sand and sandstones. A descriptive study of Conglomerate, Breccia, Sandstones and Shales.

Unit III:Chemical deposits – siliceous , carbonaceous, ferruginous and salt deposits. organic deposits – calcareous, siliceous, phosphatic, ferruginous and carbonaceous deposts. A breief study of Flint, Chert, Siderite, Gypsum, Rock Salt, Caliche. Guano and Kiesellghur. Descriptive study of different types of calcareous and carbonaceous deposits.

Unit IV:Definition of metamorphism –Agents and types of metamorphism – cataclastic metamorphism and its products.

Thermal metamorphism of pelitic sediments, pure and impure calcareous rocks. Regional (dynamothermal) metamorphism of pelitic sediments. Plutonic metamorphism. Metamorphic reactions – Dehydration Reaction, Decarbonation reaction, Solid–solid, Oxidation-reduction reaction, anataxis and palingenesis

Unit V: A brief study of metamorphic structures and textures. Definition of facies, zones and grades of metamorphism. Brief study and petrography of Slate, Phyllite, Quartzite, Schist. Gneiss, Granulite, Leptynite, Charnockite, Eclogite, Amphibolite, Lit- Par- Lit – gneiss and Migmatite, Flaser, Mylonite, Hornfels, Marble, Ophicalcite.

REFERENCE BOOKS

1. Tyreel, G.W - Principles of petrology, Asia Publishing House.
2. Harker, A. -Petrology for Students, Cambridge.
3. Turner,F,J &Verhogen,J-Igneous and Metamorphic Petrology, MC Graw Hill.
4. Williams, H, Turner, F.j. & Gillibert, C.M. - Petrography, Freeman.
5. Winkler, A. G.F. - Petrogenesis of Metamorphic Rocks, Mc Graw Hill.
6. Phillipots, P.J - Igneous and metamorphic rocks

ECONOMIC GEOLOGY - U13GY15

Semester : VI

Core Course : XIII

Instruction Hours/Week : 6

Credit : 6

Unit I : Historical development of economic Geology. Materials of mineral deposits – ore minerals, gangue minerals, tenor and grade or ores. classification of mineral deposits. Outline of Lindgren’s and Bateman’s classification. Controls of ore localization – structural controls, stratigraphic physical and chemical – brief study of metallogenetic epochs and provinces – geologic thermometers.

Unit II: Magmatic processes – mode of formation – Early magmatic processes and deposits, disseminations. segregations and injections – Late magmatic processes and deposits –

Residual liquid segregation and injection – immiscible liquid segregation and injection – sublimation. Contact Metasomatic processes – the process and effects – resulting mineral deposits. Hydrothermal processes – principles – Factors affecting deposition – wall rock alteration – minerals sequence – cavity filling deposits Fissure veins, shear zone, stock work, saddle reef, ladder vein, fold cracks, breccia filling, solution cavities, pore space and vesicular filling – replacement deposits, the process and deposits – criteria of replacement.

Unit III: Sedimentary processes and cycles – principles involved in sedimentation – cycles of Iron and manganese, weathering processes – principles- Residual concentration process and deposits – mechanical concentration principles – eluvial, alluvial, beach and eolian placers – paystreak and bonanza. Oxidation and supergene sulphide enrichment – solution and deposition in the zone of oxidation – secondary sulphide enrichments – Gossans and capping.

Metamorphic processes – Formation of Graphite, Asbestos, Talc, Soapstone and Sillimanite group of minerals.

Unit IV: Diagnostic physical properties, chemical composition, uses, modes of occurrence and distribution in India of the following economic minerals. Graphite, Realgar, Orpiment, Stibinite, Molybdenite, Cinnabar, Anglesite, Barite, Gypsum, Celestite, Corundum, Ochre, Ilmenite, Chromite, Franklinite, Cassiterite, Magnesite, Cerussite, Halite, Fluorite, Phosphatic Nodule, Monazite, Wollastonite, Colembite, Tantalite, Samarskite, Asbestos, Steatite and Vermiculite. Mineralogy, mode of occurrence, uses and distribution in India of the following precious metals and minerals. Gold deposits – Gem stones.

Character, distribution and mode of occurrence of structural and building materials.

Unit V: Mineralogy, mode of occurrences, uses and distribution in India of the following metalliferous deposits – Iron, Manganese, Aluminium, Copper, Lead, Zinc, Chromium.

Fossils fuels:– Coal – uses, classification, constitution, origin and distribution in India.

Petroleum- composition, uses, theories of origin, oil traps, and important oil fields of India.

Outline of Gas Hydrates.

TEXT BOOKS:-

1. Bateman Allan, M. -Economic Mineral Deposits, Asian Publishing House, 2nd Edition 1962.
2. Lindgren, W. -Mineral Deposits, MCGraw Hill, 1933.

REFERENCE BOOKS:-

1. Coggin, B. and Dey, A.K. - India's Mineral Wealth, oup 1955.
2. Park, C.F. and Macdiarmid, R.A- Ore deposits, Freeman, 1970

3. Krishnaswamy ,S. - India's Mineral Resources, oxford and IBH.
4. Deb.S. - Industrial Minerals and Rocis of India, Allied, 1980.
5. Gokhale, K.V.G.K. and Rao, T.C- Ore deposits of India, their distribution and processing, Thosmson press, 1978.

HYDROGEOLOGY AND ENVIRONMENTAL GEOLOGY - U13GY16E

Semester : VI **Elective Course : III**
Instruction Hours/Week : 5 **Credit : 4**

Unit I Hydrogeology : Ground water in Hydrologic cycle – origin of ground water meteoric water, connate water and Juvenile water – vertical distribution of ground water – zone of aeration, zone of saturation and water table. Springs – geological conditions favouring development of springs.

Definition of aquifers, aquitards and aquicludes. Geologic formations as Aquifers. Types of Aquifers – unconfined, confined, and perched Aquifers – Artesian wells, peizometric surface.

Unit II: Rock properties affecting Ground Water, openings in rocks. types of openings – primary openings – secondary openings. Porosity, specific yield, specific retention and permeability. Ground water movement - forces causing ground water movement: seepage, capillary movement, laminar flow, turbulent flow, Darcy's law co-efficient of permeability and field measurement of permeability. Constant Head and Falling Head Permeameters. Fluctuations in Ground water levels – causes of fluctuations.

Unit III: Ground water quality – physical, Bacterial, and chemical qualities – drinking water standards – major ions affecting chemical quality of ground water. Ground water recharge – natural and artificial recharge.

Ground water exploration – surface methods – electrical resistivity method.

Water wells – types of wells – well construction and development – collector wells and infiltration galleries. Ground water in Tamilnadu.

Unit IV Environmental Geology: Definition of ecology and environmental Geology. Different ecosystems. Classification of Natural resources. A short account of renewable and nonrenewable resources. Environmental problems due to surface geological processes. Causes, hazards and remedial measures relating to landslides, floods, and soil erosion, Impact of wind on environment. Degradation of coastal environment and measures for coastal protection.

Unit V Influence of deep seated geological processes – Earthquake hazards, Earthquake prediction control and warning. Hazards of volcanism; Techniques of volcanic prediction and human adjustments to volcanic environments. Man as an agent of environmental modifications. Environmental degradation due to mining and mineral processing. Effects of urbanization on

surface water, causes for ground water pollution. An outline on Global Warming and Climate changes.

Text Books

1. Davis, S.N. & Deweist. 1966- Hydrogeology, John Wiley & Sons.
2. Regunath, H.M. 1983 - Ground water, Wiley Eastern.
3. Todd, D.K. 1959 - Ground water Hydrology. John wiley & Sons.
4. Tolman., G.F. 1937- Ground water McGraw Hill. New York.
5. Kellar, E. A. 2000 - Environmental Geology. Prentice Hall, N. Jersey
6. Lundgren, L.1986 - Environmental Geology. Prentice Hall.
7. Valdiya, K. S. 1987 - Environmental Geology – Indian Context. Tata McGraw-Hill, New Delhi

Reference Books

1. Karanath, K.R. 1987 - Ground water Assessment Development & management Tata McGraw Hill.
2. Walton, W.C. 1970 - Ground water Resources evaluation, McGraw Hill.
3. Howard, A. D. and Ramson, I.1978 - Geology in environmental planning. McGraw Hill, New Delhi.
4. Merritts, D., de Wet, A. and Menking, K. 1998 - Environmental Geology: an earth system science approach. W. H. Freeman & Co., N. Y.
5. Montgomery, C. W. 2000 - Environmental Geology, McGraw-Hill Publications, New Delhi.
6. Strahler, A. N. and Strahler, A. H. 1973 - Environmental Geoscience: Interaction between natural systems and man. Hamilton Pub, USA.

FUEL GEOLOGY (Optional) - U13GY16E

Semester : VI

Elective Course : III

Instruction Hours/Week : 5

Credit : 4

Unit I

Natural sources of energy: Coal Geology

Definition and origin of coal. Sedimentology of coal bearing strata, types of seam. Chemical analysis of coal.

Coal Petrology:- Classification and optical properties of macerals and microlithotypes.

Application of coal petrology. Classification of coal in terms of Rank, Grade and Type. Indian classification for coking and non-coking coals.

Unit II:

Elementary Idea about coal preparation, coal carbonization, coal gasification, coal hydrogenation, coal combustion and fertilizer form coal.

Coal as a source rock in petroleum generation. Coal exploration and estimation of coal reserves. Indian coal reserves and production of coal in India.

Unit III:

Petroleum Geology: Petroleum – its composition. Origin (Formation of source rocks-kerogen, organic maturation and thermal cracking of kerogen) and migration of petroleum. Reservoir rocks-porosity and permeability. Reservoir traps – structural, stratigraphic and combination traps. Oilfield fluids – water, oil and gas.

Unit IV:

Methods of prospecting for oil and gas (geological modeling). Elementary knowledge of drilling and logging procedures. Onshore and offshore petroliferous basins of India. Geology of productive oilfields of India.

Unit V: Geothermal and Atomic energy

Atomic Fuel: Concept of atomic energy. Radioactive minerals. Mode of occurrence and association of atomic minerals in nature. Methods of exploration for atomic minerals. Uranium deposits of Jaduguda. Radio active mineral deposits of coatal India.

TEXT BOOKS:

1. Chandra, D., Singh, R.M. Singh, M.P., 2000: Textbook of Coal (Indian context). Tara Book Agency, Varanasi.
2. Holson, G.D. and Tiratso, E.N., 1985: Introduction to Petroleum Geology. Gulf Publishing, Houston, Texas.
3. Tissot, B.P. and Welte, D.H., 1984: Petroleum Formation and Occurrence, Springer – Veralg.
4. Selley, R.C., 1998: Elements of Petroleum Geology. Academic Press.
5. Durrance, E.M. 1986: Radioactivity in Geology-principles and application. Ellis Hoorwool.
6. Park, C.F. and Macdiarmid, R.A- Ore deposits, Freeman, 1970
7. Krishnaswamy ,s. - India’s Mineral Resources, oxford and IBH.
8. Deb.S. - Industrial Minerals and Rocis of India, Allied, 1980.
9. Gokhale, K.V.G.K. and Rao , T.C- Ore deposits of India, their distribution and processing, Thosmson press, 1978

ALLIED MATHEMATICS

Algebra, Calculus and Differential Equations – U13AMS1

Semester : I **First Allied Course : I**

Instruction Hours/Week: 5 **Credit : 3**

Unit I

Characteristic roots of a square matrix - Evaluation of Eigen values and Eigen vectors - Verification of Cayley – Hamilton Theorem.

Unit II

Leibnitz's theorem (statement only) for the n^{th} derivative of a product of functions – Applications - Curvature and radius of curvature in Cartesian Co-ordinates .

Unit III

General properties of definite integrals (without proof) and problems using these properties - Reduction formula for $\int_0^{\pi/2} e^{ax} x^n dx$, $\int_0^{\pi/2} \sin^n x dx$, $\int_0^{\pi/2} \cos^n x dx$, where n is a positive integer- Evaluation of

$$\int_0^{\pi/2} e^{ax} x^n dx, \int_0^{\pi/2} \sin^n x dx, \int_0^{\pi/2} \cos^n x dx \text{ where } n \text{ is a positive integer.}$$

Unit IV

Equation of First order not of First degree Equation solvable for dy/dx . Equation solvable for y - Equation solvable for x . (Simple problems only)- Clairaut's form (Simple case only).

Unit V

Formation of partial Differential equations by elimination of constants and arbitrary function- Definition of general, Particular and complete solution of partial differential equations- singular integral (Geometrical meaning not expected) solution of first order equations in their standard forms. $F(p_1, q) = 0$, $F(x, p_1, q) = 0$, $F(y, p_1, q) = 0$, $F(z, p_1, q) = 0$, $F_1(x, p) = F_2(y, q)$, $Z = p_x + q_y + f(p, q)$.

Text Books

1. T.K. Manickavasagam Pillai, T.Natarajan & K.S.Ganapathy, Algebra (Vol. II), S. Viswanathan Pvt.Ltd, Reprint, 2004 (Unit I).
2. S. Narayanan & T. K. Manickavasagam Pillay, Calculus (Vol. I), S. Viswanathan printers and publishers , Reprint 2003 (Unit II).
3. S. Narayanan & T. K. Manickavasagam Pillay, Calculus (Vol. II), S. Viswanathan printers and publishers, Reprint 2003 (Units III).
4. S, Narayanan & T.K. Manickavasagam Pillay, Calculus (Vol.III), S. Viswanathan Pvt.Ltd Reprint, 2004 (Units IV & V).

Unit I Chapter 2 §16

Unit II Chapter 3 § 2.1, 2.2 & Chapter 10 § 2.1, 2.2, 2.3, 2.4

Unit III Chapter 1 § 4, 11, 13.1, 13.3, 13.4

Unit IV Chapter 1 § 5, 5.1, 5.2, 5.3, 5.4, 6.2

Unit V Chapter 4 § 1, 2, 2.1, 2.2, 3, 5, 5.1, 5.2, 5.3, 5.4

ALLIED MATHEMATICS

Vector Calculus & Analytical Geometry of Three Dimensions - U13AMS2

Semester : I & II

First Allied Course: II

Instruction Hours/Week: 3 & 3

Credit : 3

Unit I

Vector Differentiation – Vector differential operator (∇), Gradient, Directional derivatives unit normal vector to the surface, divergence, solenoidal vector, Curl, irrotational vector, vector identities.

Unit II

Vector integration – line integral – surface integral – volume integral

Unit III

Gauss divergence theorem (statement only) verification and application – Green's theorem (statement only) and applications - Stoke's theorem (statement only), verification and application.

Unit IV

Straight line- equation of a straight line – condition for a straight line to lie on a given plane – condition for coplanarity - shortest distance between two straight lines.

Unit V

Sphere – Standard equation – Length of the tangent from any point – Equation of a tangent plane – condition for the plane to touch the sphere- Intersection of a plane and a sphere - Intersection of two spheres – Equation of a sphere passing through a given circle.

Text Books

1. K. Viswanathan and S. Selvaraj, Vector Analysis, Emerald Publishers, Chennai, 1999
(Units I, II & III).
2. S.Narayanan, R.Hanumantha Rao, T.K.Manickavasagam Pillay and P.Kandasamy, Ancillary Mathematics, Vol. IV, S.Viswanathan printers and publishers Pvt. Ltd., 1996 (Units IV & V).
 - Unit I Chapter 2 (except §2.2.5)
 - Unit II Chapter 3 § 3.2 – 3.7
 - Unit III Chapter 4 § 4.2 - 4.4
 - Unit IV Chapter 3 (Pages 70 - 85)
 - Unit V Chapter 4 (Pages 86 - 99)

ALLIED MATHEMATICS

Trigonometry, Laplace Transforms & Fourier Series - U13AMS3

Semester : II

First Allied Course: III

Instruction Hours/Week: 5

Credit : 3

Unit I

Expansion of $\cos n$, $\sin n$ and $\tan n$ (n is a positive integer) – Related problems – Expansion of \cos , \sin in terms of e^{in} – Expansion of \cos^n , \sin^n in a series of sines and cosines of multiples of θ , given in radians (proof not required) and simple problems.

Unit II

Euler's formula for e^{ix} . Definition of hyperbolic functions – relation between the circular and hyperbolic functions – Formula involving hyperbolic functions – Expansion of $\sinh x$ and $\cosh x$ in power of x . Inverse hyperbolic functions $\sinh^{-1}x$, $\cosh^{-1}x$ and $\tanh^{-1}x$ in terms of logarithmic functions separation into real and imaginary parts of $\sin(x + iy)$, $\cos(x + iy)$, $\tan(x + iy)$, $\sinh(x + iy)$, $\cosh(x + iy)$ and $\tanh(x + iy)$, $\tan^{-1}(x+iy)$

Unit III

Definition – Laplace transform of functions e^{at} , $\cos at$, $\sin at$ and t^n where n is a positive integer. First shifting theorem – Laplace transform of $e^{-at} f(t)$ is $(s + a)$ – Laplace transform of $e^{-at} \cos bt$, $e^{-at} \sin bt$ and $e^{-at} f(t)$ – Laplace transform of $f'(t)$ and $f''(t)$.

Unit IV

Inverse Laplace transform relating to the standard forms – Application to the solution of ordinary differential equations with constant coefficients involving the above transformations.

Unit V :

Definition of Fourier series – Finding Fourier coefficients for a given periodic function with period 2π (odd and even function) – Half range series.

Text Books

1. S. Narayanan, T. K. Manickavasagam Pillai, Trigonometry, S. Viswanathan Pvt. Ltd., Reprint 2004, (Units I, II).

2. S. Narayanan, T. K. Manickavasagam Pillai, Calculus Volume III, S. Viswanathan Pvt. Ltd, Reprint 2004, (Units III, IV & V)

Unit I Chapter 3 § 1, 2 (pg. 61-68), 4, 4.1, 5

Unit II Chapter 4 § 1, 2, 2.1, 2.2, 2.3

Unit III Chapter 5 § 1, 2, 4

Unit IV Chapter 5 § 6, 7, 8

Unit V Chapter 6 § 2, 3, 3.1, 3.2, 4

ALLIED CHEMISTRY I – U13ACH1

Semester : I
Instruction Hours/Week: 5

First Allied Course: 1
Credit: 3

UNIT - I

Shapes of Molecules: Application of valence shell electron pair repulsion theory to simple molecules - BF_3 , CH_4 and H_2O . **Molecular Orbital Theory:** Some important basic concepts of MO theory - LCAO, bonding and antibonding orbitals and bond order - application of MO theory to H_2 , He_2 , N_2 , O_2 , F_2 .

UNIT - II

Chemical Thermodynamics: First law of thermodynamics - state and path functions- need for the second law - Carnot's cycle and thermodynamic scale of temperature, spontaneous and non spontaneous processes- entropy - Gibb's free energy. Entropy change and free energy change to decide spontaneity, elementary idea of third law - statement and explanation.

UNIT - III

Chemotherapy: Definition of chemotherapy- examples each for (i) Analgesics, (ii) antibacterial, (iii) anti-inflammatory, (iv) antipyretic, (v) antibiotic, (vi) antitubercular, (vii) antiviral, (viii) antitussive, (ix) antiallergic, (x) antidiabetics, (xi) antihypertensive, (xii) anaesthetics (local and general) Structure not necessary. **Organic reactions:** Osazone test, biuret test, condensation reactions for aldehydes and ketones, Esterification reaction, Diazotization followed by coupling and phthalein fusion test.

UNIT - IV

Amino Acids and Proteins: Amino acids - classification based on structure - essential and non-essential amino acids - proteins - classification based on physical properties and biological functions, structure of proteins- primary, secondary and tertiary (elementary treatment).

UNIT - V

Colloids: Definition - classification of colloidal solutions - preparation, purification, properties - Non-settling, osmotic pressure, Tyndall effect, electrical charge, electrophoresis, Imbibition. **Chemical kinetics:** Order of reactions and their determinations - activation energy, effect of temperature on reaction rate.

References:

01. P.L. Soni Textbook of Inorganic chemistry
02. P.L. Soni Textbook of Organic chemistry
03. P.L. Soni Textbook of Physical chemistry

ALLIED CHEMISTRY PRACTICAL – U13ACH2P

Semester : I & II

First Allied Course: II

Instruction Hours/Week:6

Credit: 3

I VOLUMETRIC ANALYSIS

(for pcs st iii&iv)

1. Acidimetry and alkalimetry
 - (a) Strong acid vs strong base
 - (b) Weak acid vs strong base
2. Permanganimetry
 - (a) Estimation of ferrous sulphate/Mohr's salt
 - (b) Estimation of oxalic acid
3. Iodometry
 - (a) Estimation of $K_2Cr_2O_7$

II ORGANIC ANALYSIS

Qualitative analysis of the following organic compounds

1. Carboxylic acid
2. Amide
3. Primary aromatic amine
4. Aromatic aldehyde
5. Aromatic ketone
6. Carbohydrate
7. Simple phenol

ALLIED CHEMISTRY II – U13ACH3

Semester : II

First Allied Course: III

Instruction Hours/Week: 5

Credit: 3

UNIT - I

Coordination Chemistry: Complexes - Classification, IUPAC Nomenclature of mononuclear complexes. Chelation and its industrial importance with particular reference to EDTA. Biological role of haemoglobin and chlorophyll. Applications of complexes in qualitative and quantitative analytical chemistry. **Industrial Chemistry:** Fuel gases - Water gas, producer gas, L.P.G. gas, gobar gas and natural gas. Fertilizers - NPK and mixed fertilizers, micronutrients and their role in plant life and biofertilizers.

UNIT - II

Surface Chemistry: Adsorption - factors affecting the adsorption of gases by solids - types of adsorption - differences between physisorption and chemisorption - catalysis - homogeneous and heterogeneous catalysis - examples. **Photochemistry:** Laws governing the absorption of light - Lambert's law and Beer's law - laws of photochemistry - Grotthus law, Stark-Einsten's law and - quantum efficiency.

UNIT - III

Fundamental concepts in Organic chemistry: Bond length - bond energy - polar and nonpolar molecules - resonance effect - rules governing resonance - hydrogen bonding - effect on boiling points - effect on water solubility. **Synthetic polymers:** Definition - Teflon, alkyd and epoxy resins, polyesters - general treatment only.

UNIT - IV

Dyes: Definition - classification of dyes based on structure and method of application. **Fats and oils:** Definition of fats and oils - distinction between fats and oils - properties - analysis of fats and oils - saponification value, iodine value. **Carbohydrates:** Introduction - Classification - Preparation, properties and structural elucidation of glucose.

UNIT - V

Electrochemistry: Specific and equivalent conductivities - their determinations- effect of dilution on conductivity - an elementary idea about basic theory - Ostwald's dilution law, Kohlraush law, conductivity measurements and conductometric titrations. **Phase rule:** Definition of phase, component and degree of freedom. Explanation of one - component system (Water).

References:

1. P.L. Soni Textbook of Inorganic chemistry
2. P.L. Soni Textbook of Organic chemistry
3. P.L. Soni Textbook of Physical chemistry

ALLIED PHYSICS – I – U13APH1

Semester : III
Instruction Hours/Week: 5

Second Allied Course: 1
Credit: 3

Objectives:

- To study the concepts of Properties of Matter, Sound.*
- To study the concepts of Surface tension and Viscosity and Thermal Physics.*
- To study Electromagnetic Spectrum, Raman Effect and Fiber Optic Communication.*

UNIT-I: PROPERTIES OF MATTER

Stress – strain, Hooke's Law – Elastic behavior of a material – Relation between elastic constants – Work done per unit volume in longitudinal strain - Poisson Ratio - Expression for bending

moment – Experimental determination of Young's modulus by Non-uniform Bending (Pin and Microscope method).

UNIT-II: SOUND

Simple Harmonic Motion – Composition of two simple harmonic motion - along a straight line and at right angles to each other – Lissajou's figures and their applications.

Acoustics of buildings- Reverberation – Reverberation time – Sabine's formula- Conditions for Good Acoustics – Law of vibration of Stretched Strings – Sonometer.

UNIT-III: SURFACE TENSION & VISCOSITY

Definition and dimension of surface tension – Variation of surface tension with temperature – Experiment to determine the surface tension of given liquid by Drop weight method

Co-efficient of Viscosity and its dimension – Poiseuille's formula – Experiment to determine the Co-efficient of Viscosity (Poiseuilles Method).

UNIT-IV: THERMAL PHYSICS

Newton's law of cooling – Verification – Specific Heat Capacity of liquid by Cooling – Bomb Calorimeter.

Conduction- Coefficient of thermal conductivity – Good and bad Conductor. Stefan's law of radiation – Solar Constant – Angstrom's Pyroheliometer - Temperature of the Sun.

UNIT-V: OPTICS

Electromagnetic Spectrum – Spectral response of human eye – UV and IR spectroscopy – Raman Effect – Experimental Arrangement – Applications of Raman Effect.

Fiber Optic communication: Introduction – Optic Fiber – Numerical Aperature – Coherent bundle – Fiber optic communication system and its advantages – Multimode Fibre - Optic Sensors.

BOOKS FOR STUDY AND REFERENCE

1. Text book of Sound – Brij Lal and N.Subrahmanyam, Vikas Publications Pvt. Limited (2000)
2. Elements of Properties of matter – D.S.Mathur, Shyam Lal Charitable Trust, New Delhi (2005)
3. Properties of matter – R.Murugesan. S.Chand and Co. New Delhi.(1999)
4. Heat and Thermodynamics – Brij Lal and N.Subrahmanyam-S.Chand(1999).
5. Text Book of Optics – Brij Lal and N.Subrahmanyam. S.Chand and Co. Delhi.(2010)
6. Optics – Ajoy Ghatak – Tata Mc Graw Hill, Delhi(2004)-2nd edi.
7. Modern Physics- R.Murugesan, S.Chand and company Ltd., New Delhi (2006).
8. Allied Physics – I – A. Sundaravelusamy. Priya Publications.

Unit	Book	Section
I.	3	8.15, 8.16.
	4	1.1, 1.2, 1.4, 1.6, 1.7, 1.14, 1.15, 1.21.
II.	1	1.3, 2.1, 2.2, 2.8, 2.9, 10.14, 10.15, 10.16, 10.22, 7.4

III.	3	3.1, 3.12, 3.17, 2.1, 2.3, 2.7.
IV.	5	3.5, 3.15, 8.1, 8.2, 8.18, 8.25, 8.43, 8.44, 8.45
V.	6	11.15, 11.14, 11.13.
	8	19.11, 19.12, 19.13, 19.14.
	7	24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.10, 24.11, 24.11.1.

ALLIED PHYSICS PRACTICAL – U13APH2P

Semester : III & IV

Second Allied Course: II

Instruction Hours/Week:2+3

Credit: 3

(At the end of the Even Semester-Any twelve expts.)

1. Non-Uniform Bending – Pin and Microscope method.
2. Sonometer – Verification of laws of transverse vibrations.
3. Specific heat capacity of a liquid – Newton’s law of cooling method.
4. Thermal conductivity of a bad conductor – Lee’s disc method.
5. Meter Bridge – Specific Resistance of a material of a coil.
6. Carey Foster Bridge- Specific Resistance of a material of a coil.
7. Newton’s Rings –determination of Radius of Curvature(R).
8. Spectrometer – Refractive Index of a (μ) of solid prism.
9. Spectrometer- Determination of wavelength using Grating.
10. Air wedge – thickness of insulation of a wire.
11. Characteristics of a Junction Diode.
12. Co-efficient of Viscosity a liquid- Poiseuille’s method.
13. Surface Tension and Interfacial Tension of a liquid-Drop Weight method.
14. Construction of Full Wave Rectifier.
15. Study of Logic Gates-using ICs.
16. Figure of Merit-B.G.

ALLIED PHYSICS – II – U13APH3

Semester : IV

Second Allied Course: III

Instruction Hours/Week: 5

Credit: 3

Objectives:

To study Gauss law and its applications and also the principle and types of Condensers.

To study Kirchhoff’s laws, Wheatstones Bridge and their applications.

To learn atomic and nuclear physics.

To acquire knowledge about modulation and digital electronics.

UNIT –I: ELECTROSTATICS

Coulomb’s Law- Gauss law and its applications- Intensity at a point due to charged sphere and cylinder-Principle of capacitor- capacity of the spherical- cylindrical condenser -Energy of a charged capacitor- sharing of charges and loss of energy.

UNIT -II: ELECTRICITY

Kirchoff’s law- Applications- Wheatstone Bridge- Carey Foster’s Bridge-Laws of Electromagnetic induction- Expression for induced E.M.F- Self inductance- Determination of coefficient of self inductance – Rayleigh’s method-Mutual inductance of solenoid- Experimental determination of mutual inductance.

UNIT- III: ATOMIC PHYSICS:

Sommerfield, Vector Atom models-quantum numbers in vector atom model- Pauli’s exclusion principle - Continuous and characteristic X-Rays-Moseley’s law and its importance- Bragg’s law-Miller indices- Determination of crystal structure-powder crystal method.

UNIT –IV: NUCLEAR PHYSICS

Nuclear Size-charge – mass- spin- nuclear models- liquid drop model- shell model – Particle detectors- cloud chamber-bubble chamber- photographic emulsion technique-Elementary particles (fundamental ideas only).

UNIT- V: ELECTRONICS AND DIGITAL ELECTRONICS

Modulation- necessity of modulation-Methods of modulation- Amplitude Modulation- junction diode detector for AM signal.

Number systems –Decimal, Binary, Octal, Hexadecimal and their mutual conversions-binary arithmetic operations. Basic logic gates- AND, OR, NOT, NOR NAND – NOR and NAND gate as universal gates. Laws of Boolean Algebra- De Morgan’s theorems.

BOOKS FOR STUDY AND REFERENCE

1. Text book of Electricity and Magnetism- Brij Lal and N.Subrahmanyam, Ratan prakasan Mandir Publisher London. (1997).
2. Modern Physics-Murugesan, S.Chand & Co - New Delhi (2010).
3. Basic Electronics- B.L. Theraja , S.Chand & Co - New .Delhi(2008)

Unit	Book	Section
I	1	6.1-6.3, 7.1-7.4
II	1	13.21, 13.22, 13.32, 18.1,18.6, 18.9, 18.11, 18.13, 18.15
III	2	6.11-6.15, 7.11-7.13, 7.6, 7.3, 7.8
IV	2	27.3, 27.10, 27.11, 29.7, 29.9, 29.11, 38.1,
V	3	30.5, 30.8, 30.9, 30.30, 32.2-32.4, 32.7, 32.19, 32.28, 32.9-32.11, 33.3, 33.10, 33.15, 33.19-33.22, 34.3, 34.5

OFFICE AUTOMATION - U13SBE1

Semester : I

Skill Based Elective Course- I

Instruction Hours/Week: 2

Credit: 2

Unit - I

MS- Word- Introduction to Computers - Hardware - Software, Operating System: Windows XP - MS-Paint, Notepad, WordPad, Introduction to MS-Word, Creating, Editing and Formatting Document - Working with Drawing objects - Text Manipulation

Unit-II

Working with Tables – Columns – Labels - Plotting, editing and Filling drawing objects- Bookmark – Header & Footer - Checking and Correcting a document - Creating Labels –Envelops – Mail Merge – Formatted output and Report generation Printing Documents, Working with Internet.

Unit-III

Ms – Excel - Ms – Excel: Introduction – Data Entry – Cell Formatting - Plotting Graphs – Workbook Features – Library Functions

Unit-IV

Conditional Functions and Data Sorting – Limit the data on a worksheet - Data Validation –Data consolidation - Chart creation - Checking and Correcting Data - Tracking and Managing Changes- Advanced Features

Unit-V

Ms – PowerPoint- Introduction - Creating, Editing and Formatting Presentation – Applying Transition and Animation Effects - Applying Design Templates - Viewing and Setting up a Slide Show - Navigating among Different Views - Ms Outlook: Introduction to Folder List – Address

Book.References

1. Jill Murphy, Microsoft Office Word- Comprehensive Course, Labyrinth Publications, 2003.
2. McGraw-Hill/Irwin-Deborah Hinkle, Microsoft Office 2003 PowerPoint: A Professional Approach, Comprehensive w/ Student CD, New Delhi, 2003.
3. Nellai Kannan, C., MS-Office, Nels Publications, Tamil Nadu, 2002.

DESKTOP PUBLISHING - U13SBE2

Semester: III

Skill Based Elective Course: II

Instruction Hours/Week: 2

Credit: 2

PHOTOSHOP:

UNIT – I

Photoshop Tools : Move, Type, Marquee, Lasso, Crop, Shapes, Healing, Brush, Patch, Cloning

Stamp, Eraser, Gradient, Blur, Smudge, Dodge, Pen, Eye Dropper, Patch selection and Zoom tool.

Layer: New layer, Layer set, Duplicate layer, Rasterize and Merge down

Layer Styles: Drop shadow, inner shadow, outer glow & inner glow, Bevel and Emboss, Gradient overlay, Stroke. Text formatting

UNIT – II

File: Save, File formats, Page set up.

Edit: Check spelling, Copy merged, Fill, Transform, Define pattern.

Image: Motion blur, Twirl, lens flare, Glowing edges, lighting effects, solarize, water paper, Stained glass, Mosaic Tiles.

Window: Character and Paragraph settings.

COREL DRAW:

UNIT – III

Drawing Tools:

Pick, Shape, Knife, eraser, Smudge, Roughen brush, free transform, Zoom ,hand, Free hand, Bezier, Artistic, Pen, Poly line, Point, Interactive connective, Spiral tool.

Colour Tool: Paint Bucket Tool, Eye Dropper, Fill Tools. Fill Options, Stroke Options.

UNIT – IV

Special Effects: 3D effects, Add perspective, Blend, Contour, Artistic media, lens, and Power clip.

Shaping Options: Weld, trim, Intersect.

Text Effects: Format text, bullet, and fit text to path, align and straighten, spell check.

File Menu: Save, Save as, Import, Page set Up.

PAGE MAKER:

UNIT – V

Page Maker Tools:

Pointer, Rotate, Line, Rectangle, Ellipse, Polygon, Hand, Text, Crop, Rectangle frame tools. Text layout, Style and Objects: Alignments, Styles, fill, frame options, Stroke, Group, Lock, unlock, mask, polygon settings character and paragraph settings.

Text Editing: Edit story: Undo, Redo, Cut, Copy, Paste, paste Special, Spelling check and Find.

File: Page set up, save, Save as.

Reference Book:

CorelDraw :CorelDraw IN Simple Steps – Shalini Gupta Corel DRAW Bible - DEBORAH MILLER

PhotoShop :Teach Yourself Adobe Photoshop – Rose Carla Adobe Photoshop Cs Classroom in a Book by Adobe Press

PageMaker :Using Microsoft Word - Asmita Bhatt Pagemaker In Easy Steps - Scott Basham Ctoa Material By Genesis.

OFFICE AUTOMATION & DESKTOP PUBLISHING LAB - U13SBE3P

Semester : III

Skill Based Elective Course : III

Instruction Hours/Week: 2

Credit: 2

Unit – I (Office Automation)

- 1) Ms – Word : Text Formatting , Mail Merge,
- 2) Ms – Excel : Implement the Statistical & Mathematical Function (Using Min ,Max, Median, Average, Standard Deviation, Correlation, Logical 'if' Condition) for the given data, Prepare a Chart for a given Data using Pie diagram / Histogram

Unit – II (Photoshop)

- 3) Design a College Broacher / Birthday Card.
- 4) Cropping, rotating and Overlapping the image.
- 5) Create a single image from Multiple image.
- 6) Creating an image with multilayer's.

Unit – III (Corel Draw)

- 7) Design a Visiting Card \ Greeting Card using Draw & Text tools.
- 8) Create a logo for a Company \ College .

Unit – IV (Page Maker)

- 9) Type and format a letter using text tool.
- 10) Prepare a Invitation for College Day \ Sports Day.

ENVIRONMENTAL STUDIES - U13ES

Semester : II

Environmental Studies Course

Instruction Hours/Week: 2

Credit: 2

Unit 1 :

Environment and Natural Resources :

Definition, scope, importance of Environmental Studies - Need for public awareness. Natural resources — classification - Associated problems

- a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Unit 2: Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem:
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3: Biodiversity and its conservation

- Introduction — Definition : genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-spots of biodiversity.
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity In-situ and Ex-situ conservation of biodiversity.

Unit 4: Environmental Pollution

Definition

- Cause, effects and control measures of
 - a. Air pollution
 - b. Water pollution
 - c. Soil pollution

- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

- Solid waste Management : Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management floods, earthquake, cyclone and landslides.

Unit 5 : Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

REFERENCE

- a) Agarwal, K.C. 2001 Environmental Biology, Nidi Pubi. Ltd. Bikaner.
- b) Sharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad — 380 013,. India, Email:mapin@icenet.net (R)
- c) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- d) Clark R.S., Marine Pollution, Clarendon Press Oxford (TB)
- e) Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
- f) De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- g) Down to Earth, Centre for Science and Environment (R)
- h) Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev.,

Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p

i) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)

j) Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.

k) Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.

l) Mckinney, M.L. & School, R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition. 639p.

m) Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)

n) Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)

o) Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p

p) Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Pubi. Co. Pvt. Ltd. 345p. q) Sharma B.K., 2001. Environmental Chemistry. Geol Pubi. House, Meerut

r) Survey of the Environment, The Hindu (M)

s) Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB) t) Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Stadards, Vol I and II, Enviro Media (R)

u) Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB) v) Wanger K.D., 1998 Environmental Management. W.B. Saunders Co.Philadelphia, USA 499p (M) Magazine (R) Reference (TB) Textbook

VALUE EDUCATION - U13VE

Semester :V **Value Education Course**
Instruction Hours/Week: 2 **Credit: 2**

UNIT 1: PHILOSOPHY OF LIFE

Human Life on Earth (Kural 629), Purpose of Life (Kural 46) Meaning and Philosophy of Life(Kural 131, 226) The Law of Nature (Kural 374) Glorifying All form of Life in this Universe (Kural 322, 327) – Protecting Nature /Universe (Kural 16, 20, 1038)

UNIT 2: INDIVIDUAL QUALITIES

Basic Culture (Kural 72, 431) Thought Analysis (Kural 282, 467, 666) Regulating desire (Kural 367), Guarding against anger (Kural 158, 305, 306, 314), To get rid of Anxiety (Kural 629), The Rewards of Blessing (Kural 3), Benevolence of Friendship (Kural 786), Love and Charity (Kural 76), Self – tranquility/Peace (Kural 318)

UNIT 3: SOCIAL VALUES (INDIVIDUAL AND SOCIAL WELFARE)

Family (Kural 45), Peace in Family (Kural 1025), Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) , The Pride of Womanhood (Kural 56) Five responsibilities/duties of Man : a) to himself, b) to his family, c) to his environment, d) to his society, e) to the Universe in his lives (Kural 43, 981), Thriftness (Thrift)/Economics (Kural 754), Health (Kural 298), Education (Kural 400),

Governance (Kural 691), People's responsibility/ duties of the community (Kural 37), World peace (Kural 572)

UNIT 4: MIND CULTURE

Mind Culture (Kural 457) Life and Mind - Bio - magnetism, Universal Magnetism (God – Realization and Self Realization) - Genetic Centre – Thought Action – Short term Memory – Expansiveness – Thought – Waves, Channelising the Mind, Stages - Meditation (Kural 261, 266, 270), Spiritual Value (Kural 423)

UNIT 5: TENDING PERSONAL HEALTH

Structure of the body, the three forces of the body, life body relation, natural causes and unnatural causes for diseases (Kural 941), Methods in Curing diseases (Kural 948, 949)
The Five units, simple physical exercises.

Books for Reference:

1. Philosophy of Universal Magnetism (Bio-magnetism, Universal Magnetism) The World Community Service Centre Vethatri Publications (for Unit IV)
2. Pope, G.U., Dr. Rev., Thirukkural with English Translation, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613004 (for All Units)
3. Value Education for Health, Happiness and Harmony, The World Community Service Centre Vethatri Publications Rs 35/- (for All Units)

SOFT SKILLS - U13SS

Semester :V **Soft Skills**
Instruction Hours/Week: 2 **Credit: 2**

Learning objective

Today's world is all about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way. This course intends to enable students to achieve excellence in both personal and professional life.

Unit I

Know Thyself / Understanding Self

Introduction to soft skills self discovery – Developing positive attitude – Improving perceptions – Forming values.

Unit II

Interpersonal Skills/ Understanding Others

Developing interpersonal relationship –Team building –group dynamics –Net working- Improved work relationship

Unit III

Communication Skills/ Communication with others

Art of Listening –Art of reading –Art of speaking –Art of writing –Art of writing emails-e mail etiquette

Unit IV

Corporate Skills/ Working with Others

Developing body language –Practising etiquette and mannerism – Time management – Stress management.

Unit V

Selling Self/ Job Hunting

Writing resume /cv-interview skills – Group discussion –Mock interview Mock GD –Goal setting –Career planning

TEXT BOOKS

Meena. K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success) P.R. Publishers & Distributors, No, B-20 &21, V.M.M Complex, Chatiram Bus Stand, Tiruchirapalli -620 002.

(Phone No: 0431-2702824: Mobile No: 94433 70597, 98430 7442)

Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi -110 055.

Mobile No: 94425 14814(Dr.K.Alex)

REFERENCE BOOKS

- (i) Developing the leader within you John C Maxwell
- (ii) Good to Great by Jim Collins
- (iii) The Seven habits of highly effective people Stephen Covey
- (iv) Emotional Intelligence Daniel Goleman
- (v) You can Win Shive Khera
- (vi) Principle centred leadership Stephen Covey

GENDER STUDIES - U13GS

Semester :VI

Gender Studies Course

Instruction Hours/Week:1

Credit: 1

Objectives

To make boys and girls aware of each other strengths and weakness

To develop sensitivity towards both genders in order to lead an ethically enriched life.

To promote attitudinal change towards a gender balanced ambience and Women empowerment

Unit-I

Concepts of Gender: Sex-Gender-Biological Determinism- Patriarchy- Feminism -Gender Discrimination -Gender Division of Labour -Gender Stereotyping-Gender Sensitivity - Gender Equity — Equality-Gender Mainstreaming Empowerment

Unit-II

Women's Studies Vs Gender Studies: UGC's Guidelines - VII to XI Plans- Gender Studies: Beijing Conference and CEDAW-Exclusiveness and Inclusiveness.

Unit III

Areas of Gender Discrimination: Family Sex Ratio-Literacy -Health -Governance Religion Work Vs Employment- Market - Media - Politics Law Domestic Violence — Sexual Harassment — State Policies and Planning

Unit-IV

Women Development and Gender Empowerment: Initiatives International Women's Decade - International Women's Year - National Policy for Empowerment of Women - Women Empowerment Year 2001- Mainstreaming Global Policies.

Unit-V

Women's Movements and Safeguarding Mechanism:— In India National / State Commission for Women (NCW) - All Women Police Station Family Court- Domestic Violence Act - Prevention of Sexual Harassment at Work Place Supreme Court Guidelines - Maternity Benefit Act - PNDT Act - Hindu Succession Act 2003 Eve Teasing Prevention Act - Self Help Groups 73 and 74 Amendment for PRIS.

References

- Bhasin Kamala, Understanding Gender: Gender Basics, New Delhi: Women Unlimited 2004
- Bhasin Kamala, Exploring Masculinity: Gender Basics, New Delhi: Women Unlimited, 2004
- Bhasin Kamala, What is Patriarchy? : Gender Basics, New Delhi: Women Unlimited, 1993
- Pernau Margrit Ahmad Imtiaz, Reifeld Hermut (ed.) Family and Gender: Changing Values in Germany and India, New Delhi: Sage Publications, 2003
- Agarwal Bina, Humphries Jane and Robeyns Ingrid (ed.) Capabilities, Freedom, and Equality: Amartya Sen's Work from a Gender Perspective, New Delhi: Oxford University Press, 2006
- Rajadurai.S.V, Geetha.V, Themes in Caste Gender and Religion, Tiruchirappalli: Bharathidasan University, 2007

Misra Geetanjali, Chandiramani Radhika (ed.,) Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi: Sage Publication, 2005

Rao Anupama (ed.,) Gender &Caste: Issues in Contemporary Indian Feminism, New Delhi: Kali for Women, 2003

Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publications, 2003

Krishna Sumi,(ed.,) Livelihood and Gender Equity in Community Resource Management New Delhi: Sage Publication, 2004

Wharton .S Amy, The Sociology of Gender: An Introduction to Theory and Research, USA: Blackwell Publishing, 2005.

Mohanty Manoranjan (ed.,) Class, Caste, Gender: Readings in Indian Government and Politics-5, New Delhi: Sage Publications,2004.

Arya Sadhna, Women, Gender Equality and the State, New Delhi: Deep & Deep Publications,2000.
