MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for M.Sc. Geology
(Choice Based Credit System)
(with effect from the academic year 2017- 2018 onwards)

Sem	Sub. No	Subject Status	Subject Title	Hrs./Week	C Credits
Semester III	13	Core 11	Igneous Petrology	6	5
	14	Core 12	Sedimentary Petrology	6	4
	15	Core 13	Applied Geology- (Fuel Geology, Engineering Geology, Mining Geology and Ore Dressing)	5	4
	16	Core 14	Research Methodology	5	4
	17	Core 15 Practicl V	Practical Based on Igneous and Sedimentary Petrology	4	2
	18	Core 16 Practical VI	Practical Based on Applied Geology - Geophysics and Geochemistry , Engineering , Mining Geology and Ore Dressing	4	2
		Total		30	21
Semester IV	19	Core 17	Metamorphic Petrology	4	4
	20	Core 18	Economic Geology and Mineral economics	4	4
	21	Core 19	Applied Geophysics and Geochemistry	4	4
	22	Core 20 Practical VII	Practical Based on Metamorphic Petrology and Economic Geology and Mineral economics	4	2
	23	Core 21 Practical VIII	Practical Based on Applied Geophysics and Geochemistry	4	2
	24	Core practical IX (report submission and viva)	Field Work- Long field trip, Geological Mapping. Short field trips and Professional training- Industrial Training and Specimen Collection. Viva voce on Long field trip, mapping, industrial training and short field trips.	3	3
	25	Core Project (report + viva)	Project field work, Lab work, project report submission and Viva voce on Project	7	8

*L- Lecture *T- Tutorial *P- Practical *C- Credit

Course Objectives:

1. To enable the students to have a through exposure to the different branches of the Science of Geology so as to grasp a comprehensive knowledge of Geology.
2. To facilitate the students of M.Sc. Geology to join further studies which in turn offer them both job opportunities and research pursuits.
3. To help the students of Geology apply for the skills and knowledge gained through Geology to real life situation and face competitive examination with confidence.
4. Upon successful completion of this course, students will have acquired a familiarity with the fundamentals of the scientific methods in Geology, Geophysics and Environmental Earth science.

Eligibility Norms for Admission to M.Sc., Geology:

Candidates for admission to the M.Sc., Degree (Geology) Course shall be required to pass the final examination of B.Sc., Geology and equivalent there to with a minimum marks under academic stream or a course of studies recognized and approved by the Syndicate of the Manonmaniam Sundaranar University, Tirunelveli.

IGNEOUS PETROLOGY

L	T	P	C
6	0	0	4

Objective:

To understand the forms, structures and textures of the intrusive nature of the igneous rocks, Crystallization, classification and petrogenesis of igneous rocks.

Pre-Requisite

Basic knowledge in Igneous rocks at UG level

Outcome

Student would understand the paragenesis of minerals of the Igneous rocks.

Unit -I CLASSIFICATION OF IGNEOUS ROCKS 18

Forms, structures and textures of igneous rocks and their significance-classification of igneous rocks - mineralogical and chemical, C.I.P.W, Niggli, Tyrrel, IUGS and Rosenbusch.

Unit -II PHASE DIAGRAMS & IGNEOUS ROCKS OF DIFFERENT TECTONIC SETTINGS 24

Application of physical chemistry in petrogenesis-phase rule and equillibrium in silicate system - consolidation of magma with binary systems and ternary systems - crystallization of two component systems diopside – anorthite system,alibite-anorthite system, leucite - silica system, and crystallization of three component systems Alibite - anorthite – diopside system, Anorthite – forsterite - silica system, Diopside-forsterite-silica system Nephline-kalsilite-silica system and Anorthite-leucite-silica system.

Unit -III DESCRIPTIVE PETROLOGY 15

Crystallization of Magma with Particular Reference to Basaltic Magma-Reaction Principle-Diversity of Igneous Rocks - Petrographic Provinces-variation diagrams.

Unit -IV PETROGRAPHY OF IGNEOUS ROCKS 18

Petrography and Petrology – Granite clan, Syenite clan, Gabbro clan, Lunar rocks, Ultrabasic and Ultramafic rocks, Peridotite, Dunite, Lamprophyre, Pegmatite, Aplite, Basalt, Spillite and Keratophyre.

Unit -V PETROGENESIS OF IGNEOUS ROCKS 15

Petrogenesis of Granite, Pegmatites, Alkaline rocks, Anorthosites, Carnbonatites, Charnockite, Ultrabasic rocks and Lamprophyres.

TOTAL : 90 PERIODS

Text Book:-

1.Tyrrel,G.W,1963 Principle of petrology. Methunn&co

2.Turner,F.J,Verhoogen,J.1960-Igneous and Metamorphic petrology, McGraw Hill Co,Newyork.

3.Bowen,n.l.,1968 -Evolution of igneous rocks dover publication.

References:-

4.Huang,T,1962-Petrology McGraw hill book.Co .,

5. Hatch, F.E, Wells, A.K and Wells, M.K, 1949- Petrology of igneous rocks, Thomas Mury and co.

6. Hyndman, Donald, 1972- Petrology of Igneous and Metamorphic rocks,mcgraw hill book co.

SEDIMENTARY PETROLOGY

	L	T	P	C
Objectives:	6	0	0	4

To become familiar with the petrographic nomenclature of sedimentary rocks. To learn about the occurrence, origin, classification and environments of sedimentary rocks.

Pre-Requisite

Basic knowledge of Sedimentary rocks at UG level

Outcome

Student would understand the weathering, provenance, depositional environments, climate and tectonics of the sedimentary rocks

Unit -I ORIGIN AND CLASSIFICATION OF SEDIMENTS 20

The texture of sediments-size, shape and roundness, porosity and permeability. textures of non - clastic sediments – the mechanical and chemical structures of sedimentary rocks-classification of sedimentary rocks - graban, krynine, pettijohn and Goldschmidt.

Unit -II SEDIMENTOLOGY 15

Study of important clastic and non-clastic rocks, sandstones, classification.terminology, chemical composition, origin of chemical cements. Mud rocks - mineral and chemical composition, sedimentary structure, compaction of mud rocks and porosity.

Unit -III MECHANISM OF SEDIMENTARY ROCKS 20

Mineralogy, carbonate frame work, Organic matter, Limestone, sedmentary structures. Diagenetic process. Sedmentary classification of limestone. Dolomite –primary and secondary mechanism of dolomitisation, dedolomitisation. Evaporites and native sulpur. Chert-texture, genesis and origin. Phosphates-mineralogy and genesis.

Unit -IV SEDIMENTS FORMATION 20

Concept of sediment size and grade scale - principles of mechanical analysis, parameters of the frequency distribution of sediments-median, mode,mean,sorting velocities of small particles-stoke’s law. Porosity and permeability and their determination in sediments. Measurement of roundness and sphericity and their significance.

Unit -V SEDIMENTARY FACIES 15

Methods of heavy minerals separation and their significance in sediments-sedimentary environments and facies; diagenesis and lithification-physical and chemical factors in sedimentation.

TOTAL : 90 PERIODS

Text Book:-

1. Blatt H, Middletion, Grand Murray.R, 1972.Origin of sedimentary rocks, Prentice Hall.

2. Carver,R.E.197. Procedures in sedimentary petrology, Inter Science.

3.Folk.F.L., 1968.Petrology of sedimentary rocks Hempill's University station Texas,

References.

4. Krumbein W.C.and Pettijohn F.J. 1938, Manual of sedimentary petrology, Appleton Century co.

5. Pettijohn F.J.,Potter,p.e. 1972.Silver.r.sand and stones. Springer-Verlag.

6. Pettijohn F.J. 1857. Sedimentary rocks.harper&row,.

7. Selley R.C. 1972. Ancient sedimentary environments Corwell University press.

APPLIED GEOLOGY
(Fuel Geology, Engineering Geology, Mining Geology and Ore Dressing)

L	T	P	C
5	0	0	4

Objectives:

To become familiar with various aspects of Applied geology.

Pre-Requisite

Basic knowledge is about the Applied geology aspects in UG level.

Outcome:

Student would understand the detailed Applied geology aspects in mining, ore processing and engineering field.

Unit I PETROLEUM 15

Petroleum – Introduction, origin, nature and migration (primary and secondary) of oil and gas; surface and subsurface occurrence of petroleum and gas; oil-bearing basins of India; geology of the productive oil fields of India; position of oil and natural gas in India; future prospects and the economic scenario.

Unit-II COAL AND ATOMIC FUEL 18

Coal - Definition and origin of kerogen and coal; sedimentology of coal bearing strata; rank, grade and type of coal; Indian and International classifications of coal; macroscopic ingredients and microscopic constituents; concept of maceral and microlithotypes. Atomic fuel - Mode of occurrence and association of atomic minerals in nature; atomic minerals as source of energy; methods of prospecting and productive geological horizons in India; nuclear power stations of the country and future prospects; atomic fuels and environment

Unit-III ENGINEERING GEOLOGY 12

Role of engineering geology in civil construction and mining industry various stages of engineering geological investigation for civil engineering projects like Dam, Reservoir and Tunnel. Engineering properties of rocks, properties of building stones; soil - physical and engineering properties of soils - classification of soil and soil groups of India.

Unit-IV MINING GEOLOGY 15

Prospecting, Sampling and evaluation of ore resources. Definition– Open cast and underground mining. Alluvial mining, Underground mining methods, Coal mining methods, Room and Pillar method, Long wall advancing Long wall retreating, Horizon mining, Underground hydraulic mining and strip mining.

Unit –V ORE DRESSING 15

General Principles- Size reduction, Rod mills, Ball mills and Tube Mills. Screening - Principles of Magnetic separation and electrostatic separation. Floatation - Beneficiation of some important metals: Copper – Aluminium – Iron – Gold – Manganese – Titanium – Zinc – Lead.

TOTAL : 75 PERIODS

Text Book:-

1. Dobrin M.B., and Savit C.H.,1988. Introduction to Geophysical Prospecting (4th ed.,) McGraw – Hill, New York.
2. Parasnis D. S .1997, Principles of applied geophysics, Chapman & Hall, 2-6 Boundary Row, London SE1 8HN, UK.
3. Ramachandra Rao, M.B., Prasaranga, 1975. Outlines of Geophysical Prospecting - A manual for geologists by University of Mysore, Mysore,

References:-

4. Telford, W.M. Geldart, L.P. and Sherriff, R.E., 1990. Applied Geophysics, 2nd Ed, Cambridge University Press, Cambridge, 770 pp.
5. Kruskopf.E.B. 1967. Introduction to geochemistry, mcgraw, hill.
6. Brian mason, 1966.principles of geochemistry,willey
7. Brounlow,A.N. 1979.Geochemistry,prentice hall.
8. Richards R.H.and C.E. Lecke, 1927. Hand book of ore dressing , Mc.Graw Hill Book co.
9. Gaudin A.M., 1939. Principles of mineral dressing , Mc – Graw Hill Book co.
10. Truscott S.J. 1923– Text book of ore dressing , Macmillan co.
11. Gohahle and Rao, T.C. 1972. ore deposits of India – Thosman Press India ltd.
12. Krynine and Judd – Principle of Engineering Geology and Geotechniques.
13. Valdiya, K.S. 1987.Environmental Geology - Indian Context, Tata – McGrawhill New Delhi.1977.
14. Arogyaswamy , R.N.P. 1996. Courses in mining geology , Oxford & IBH – Publishers.

RESEARCH METHODOLOGY

L	T	P	C
5	0	0	4

Objectives:

To become familiar with various research methodology aspects.

Pre-Requisite

Basic knowledge is about research activities of various branches of geology in UG level.

Outcome:

Student would understand the various research methodology in different branches of geology.

UNIT I INTRODUCTION TO RESEARCH 18

Definition – scientific Method – Bias and Prejudice in scientific research – Hypothesis, theory and scientific Law – Research design – Preparation of research project – Report writing.

UNIT II THESIS WRITING 12

Structure of thesis - Copyright waiver- Declaration - Title page - Abstract - Acknowledgments - Table of contents - Introduction - Literature review - Materials and Methods - Theory - Results and discussion - Conclusions and suggestions for further work – Summary - References – Bibliography - Footnotes and endnotes and appendices

UNIT III FIELD WORK IN GEOLOGY 18

Field instruments (Geological Rock Hammer, Brunton, GPS, Altimeter, pedometer), Essentials of topographic and geological maps and mapping - pre-requirements and sampling of geological specimens (fossils, rocks, oriented rocks, groundwater and unconsolidated sediments), measurements of structural features in rock types – bedding, lineation, foliation, fold, fault, shear zone and unconformity.

UNIT IV INSTRUMENTATION 12

General principles, description and uses of following: Polarizing microscopes, ore microscopes, Scanning Electron Microscope, mirror stereoscope, heavy mineral separators

(mechanical and electromagnetic). Analytical instruments: General principles, description and uses of following; XRF, XRD, Atomic Absorption Spectrophotometer, Electron Probe Micro Analyzer, Inductively Coupled Plasma – MS.

UNIT V GEOLOGICAL LABORATORY PROCEDURES 15

Maceration techniques, thin section making, induration techniques for unconsolidated sediments, tracers, staining techniques for feldspar identification - Construction and use of wind rose, fence diagram, Wolf's net, equal area, trilinear diagram.

TOTAL : 75 PERIODS

Text Book:-

1. Phillips, E.M and Pugh, D.S., 1994. 'How to get a PhD: a handbook for students and their supervisors'. Open University Press, Buckingham, England.
2. Tufte, E.R., 1983. 'The visual display of quantitative information'. Graphics Press, Cheshire, Conn.
3. Mishra R.P., 1989. Research Methodology. Concept Publishing Co, New Delhi..

References:-

4. Comption R.R., 1962.Manual of field geology, Wiley.
5. Lahee H., 1959. Field geology, McGraw-Hill.

PRACTICAL V
(Igneous and Sedimentary Petrology)

L	T	P	
0	0	4	2

- Megascopic and microscopic study of different igneous and Sedimentary rocks.
- Petrochemical calculations CIPW Norm, Variation diagram of Harker, Niggli.

TOTAL : 60 PERIODS

PRACTICAL VI
(Applied Geology- Geophysics and Geochemistry, Engineering, Mining Geology and Ore Dressing)

L	T	P	
0	**0**	**4**	**2**

- Problems related to Engineering geology, Mining geology, ore dressing, geo physics and geo chemistry.
- Calculation of Ore reserve estimation.

TOTAL : 60 PERIODS

METAMORPHIC PETROLOGY

	L	T	P	C
Objectives :	4	0	0	4

To become familiar with the petrographic nomenclature of metamorphic rocks. To learn about the kinds, textures and structures, zones, grades and facies, occurrences and stability of metamorphic mineral assemblages.

Pre-Requisite

Basic knowledge in metamorphic petrology aspects in UG level.

Outcome:

Student would understand the detailed knowledge about the different metamorphic processes operated in the earth.

Unit-I METAMORPHISM 13

Agents and kinds of metamorphism, the Gibbs Phase Rule and Goldschmidt's mineralogical phase rule.

Unit-II METAMORPHIC ZONES 13

Classification of metamorphic rocks. Metamorphic textures and structures. Metamorphic grades and zones concepts-depth zones, contact metamorphic zones, Barrowian zones, Buchan zones, Sanbagawa zones, Franciscan zones, Dharwarian zones. Paired metamorphic belts.

Unit-III METAMORPHIC FACIES & METASOMATISM 12

Concept of metamorphic facies.facies classification of metamorphic rocks.Views of Eskola, Winkler, Turner and Verhoogen. Graphical representation of facies diagrams - ACF and AKF diagrams. Metamorphic differentiation. Metasomatism, Granitisation.

Unit-IV METAMORPHIC EFFECTS 10

Thermal, cataclastic ,and regional metamorphism and their effects on carbonates,argillaceous,arenaceous and acid ,basic and ultrabasic igneous rocks. Retrograde metamorphism.

Unit-V ORIGIN OF METAMORPHIC ROCKS 12

Migmatisation, Charnockitisation, Palingenesis, Origin of Eclogites, origin of Amphibolites metamorphism In relation to plate tectonics, Magmatic emplacements and orogenesis.

TOTAL : 60 PERIODS

Text Book:-

1. Tyrrell, G.W. 1963. Principles of Petrology, Methunn, Co.
2. Winkler H.G.F. 1974. Petrogenesis of Metamorphic rocks, Third Edn. Springer Verlag.
3. Turner F.J. 1968. Metamorphic Petrology, McGraw Hill.

References:-

4. Miyashiro, A. 1973. Metamorphism and metamorphic belts Allan and Unwin.
5. Hyndman, F.D. 1972. Petrology of Igneous & Metamorphic rocks McGraw Hill.
6. Bhaskar Rao,1986, Metamorphic petrology, International Book house, Second ED,m 12. Bangalow Road, Delhi- 110 007.Williams, H ,F.J Turner and C.M., Ghilbert, 1954, Petrography. W.H. Freeman and Co.,
7. Winkler, H.G.S. 1979. Pertogenesis of Metamorphic rocks, Springer Verlag Vth ed.

ECONOMIC GEOLOGY AND MINERAL ECONOMICS

	L	T	P	C
Objectives :	4	0	0	4

To learn about geology of the non metallic minerals and their industrial applications, distribution and mode of occurrences. To gain knowledge about the mines legislation of India, National mineral policy, and their role in National economy.

Pre-Requisite

Basic knowledge is economic geology at UG level.

Outcome:

Student would understand the detailed genesis, occurrences and its application of economic minerals.

UNIT-I PRINCIPLES OF ECONOMIC GEOLOGY 15

Concept - Scope of study- Peculiarities In mineral industry - A brief outline of World's mineral resources including marine origin. Mining laws - major and minor minerals - royalty on minerals- an overview of the mines and minerals (regulation and development) act. Tenor, grade and specification of ores.

Unit II SURFACE PROCESSES 15

Strategic, critical and essential minerals - classification of minerals from military point of view - Mineral conservation and substitution - Outline of National Mineral policy. Process of formation of mineral deposits; Magmatic concentration – Contact metasomatism-Hydrothermal processes-Metasomatic replacement –Sedimentation- Evaporation – Residual and mechanical concentration – Oxidation and supergene enrichment – Metamorphism.

Unit III INTERNAL PROCESSES 10

Controls of ore localization, Mineral paragenesis and zoning, Geothermometry, geobarometry, paragenetic sequence, zoning and dating of ore deposits. Features, structures of ore and gangue minerals. Fluid inclusions, wall rock alteration. Metallogenic Epochs and Provinces – Geologic setting and genesis of the following Indian mineral deposits. Iron, Manganese, Chromium, Nickel, Cobalt, Vanadium, Molybdenum, Tungsten, Copper, Lead, Zinc, Tin, Gold, Silver, Aluminium, Magnesium, Titanium, Uranium, Thorium, Mineral wealth of Tamilnadu and Pondicherry.

Unit IV USES OF MINERALS 10

Minerals used in the manufacture of cement, Abrasives, Precious and semi-precious minerals, Refractories, Metallurgical, Fertilizer, Building Industries, Ceramics, Glass, Chemicals, Paints and Pigments and Insulators – Mineral water and Ground water.

Unit V ORE MICROSCOPY 10

The ore microscope, Preparation of polished surface of ores, Physical and optical properties of ore mineral, microchemical techniques and applications of ore microscopy. Techniques of investigations in ore mineragraphic studies.

TOTAL : 60 PERIODS

Text Book:-

1.Bateman. A.M. Economic mineral deposits, John Wiley & Sons

2.Krishnaswamy. S . 1972.India's Mineral Resources, Oxford and IBH Publishers New Delhi

3.Gokhale and Rao Oredeposits of India, Thompson press, New Delhi.

4. Sinha,R.K.,sharma,N.L.,1976-Mineraleconomics.second edition ,oxford& ibh publication co.New Delhi,368pp.

References:-

5.Krishnaswamy,S.,- 1971 – Indian Mineral Resources, oxford&ibh publishing co., New Delhi.

6.Arogyaswamy,R.N.P.,1973 - Courses in Mining Geology ,oxford and ibh publishing co., New Delhi.

7.Kaulis Kisos Chatterjee (1970), An introduction to mineral economics, Wiley Easternlimited publisher, New Delhi.

8.Sinha R.K and Sharma N.L (1970), Mineral economics, Oxford and IBH publishing co.,

9.Umathya R.M (2006), Mineral deposits in India, Datisons publisher, Nagpur.

10. Umeshwar Prasad (1996), Economic geology, CBS publishers and distributors, New Delhi.

APPLIED GEOPHYSICS AND GEOCHEMISTRY

	L	T	P	C
Objectives:	4	0	0	4

To become familiar with various aspects of Geophysics and Geochemistry.

Pre-Requisite

Basic knowledge is about the Geophysics and Geochemistry aspects in UG level.

Outcome:

Student would understand the detailed Geophysics and Geochemistry aspects in mining, rock, water, soil analysis and engineering field.

Unit I GEOPHYSICAL METHODS 15

Geophysics – Definition – Subsurface exploration – Interrelationship between geology and geophysics - Geophysical methods – Types of measurements – exploration based on electrical resistivity method – Instrumentation and field Procedure – electrode arrangement of different configuration – VES, 2D ERI, 3D ERI (ERI – Electrical Resistivity Imaging – Square array method – Fundamentals of seismic prospecting - Seismic studies– field procedure – Data interpretation. Principles of gravity method- gravimeter- field surveys and interpretation.

Unit II MAGNETIC SURVEY 10

Magnetic studies – Instrument for magnetic survey – field procedure – data interpretation. Radioactivity and its detection- Scintillation Counter. Field procedure and interpretation, principle of air – borne and well logging methods.

UNIT-III PRINCIPLES OF GEOCHEMISTRY 15

Definition, aims and scope, geochemical structure and composition of the earth. Different hypothesis about core, mantle and crust. Distribution of elements in the geospheres. Geochemical affinity. Geochemical classification of elements. Geochemisty of geospheres, lithosphere, hydrosphers, biosphere and atmosphere.

UNIT-IV EXPLORATION GEOCHEMISTRY 10

Geochemical differentiation of elements, geochemistry of lithosphere(a) magmatic cycle with reference to behaviour of elements during crystallization, differentiation,early

magmatic, middle magmatic and late post magmatic stages magmatic cycle. The chemical principles of crystal.

UNIT-V ENVIRONMENTAL GEOCHEMISTRY 10

Exogenic Cycle – Sedimentation – Principles – Process – Products of Weathering. Geochemical Classification of Sediments.

TOTAL : 60 PERIODS

Text Book:

1. Dobrin M.B., and Savit C.H.,1988. Introduction to Geophysical Prospecting (4th ed.,) McGraw – Hill, New York.
2. Parasnis D. S .1997, Principles of applied geophysics, Chapman & Hall, 2-6 Boundary Row, London SE1 8HN, UK.
3. Ramachandra Rao, M.B., Prasaranga, 1975. Outlines of Geophysical Prospecting - A manual for geologists by University of Mysore, Mysore,.

References:-

4. Telford, W.M. Geldart, L.P. and Sherriff, R.E., 1990. Applied Geophysics, 2nd Ed, Cambridge University Press, Cambridge, 770 pp.
5. Kruskopf.E.B. 1967. Introduction to geochemistry, mcgraw, hill.
6. Brian mason, 1966.principles of geochemistry,willey
7. Brounlow,A.N. 1979.Geochemistry,prentice hall.

Practical VII

(Metamorphic Petrology and Economic Geology and Mineral Economics)

		L	T	P	C
Metamorphic Petrology	30	0	0	4	4

- Study of metamorphic rocks in hand specimen;
- Study of metamorphic rocks in thin sections;
- Structures and textures in metamorphic rocks;
- Interpretation of reaction texture;
- Plotting of chemical data on ACF, AKF and AFM diagrams;
- Preparation of metamorphic rock slides.

Economic Geology and Mineral Economics 30

Identification and description of the following economic minerals:

Magnetite, Ilmenite, Hematite, Pyrite, Pyrolusite, Psilomelane, Chromite, Wulframite, Chalcopyrite, Malachite, Galena, Magnesite, Bauxite, Stibnite, Cinnabar, Gypsum, Barite, Monazite, Rutile, Sillimanite, Kyanite, Corundum, Calcite, Dolomite, Beryl, Asbestos, Orpiment.

TOTAL : 60 PERIODS

PRACTICAL VIII

Applied Geophysics and Geochemistry

L	T	P	C
0	0	4	2

- Problems related to Applied Geochemistry 30
- Problems related to Applied Geophysics 30

TOTAL : 60 PERIODS

(Viva Voce on Mapping, Field Training, Industrial Training and Short Field Trips)

	L	T	P	C
Viva Voce on	**0**	**0**	**3**	**3**

- Geological mapping (Ten days)
- Geological tour more than three weeks days
- Short field trips
- Industrial/In plant training and Specimen collection
- Specimen collection and short field trips
- All Reports submission

TOTAL : 45 PERIODS

Project Viva Voce
(Viva Voce on Mapping, Field Training, Industrial Training and Short Field Trips)

	L	T	P	C
Project evaluation and Viva Voce	**7**	**0**	**0**	**8**

The Project Oriented Dissertation must be submitted by the end of fourth Semester with a Viva Voce before the faculty members and the board of examiners for the purpose of evaluation. During the course of completion of the Dissertation work the students will be required to complete various assignments given to them by their respective supervisors for the purpose of their evaluation. The Dissertation shall be of 4 credits out of which 8 credits (50 marks) will be evaluated by the Board of Examiners through a presentation and Viva-Voce examination while 4 credits (50 marks) will be evaluated by the respective supervisor.

TOTAL : 105 PERIODS