MODIFIED CBCS CURRICULUM OF

GEOLOGY GENERAL PROGRAMME

SUBJECT CODE = 00

FOR UNDER GRADUATE COURSES UNDER RANCHI UNIVERSITY

Implemented from
Academic Session 2019-2022

Members of Board of Studies of CBCS Under- Graduate Syllabus as per Guidelines of the Ranchi University, Ranchi.

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Kindly notify the syllabus in R.U. Website

27.8.18
Dr. Uday Kumar
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Head
University Department of Geology
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Table A -1: Distribution of 120 Credits [*wherever there is a practical there will be no tutorial and vice –versa.]

Course	Papers	Credits Theory + Practical	Credits Theory + Tutorial
I. Core Course	**(DSC A to D)**		
04 Courses from each of the 03 discipline of choice			
Theory	4x3=12 Papers	12X4=48	12X5=60
Practical/Tutorial*	4x3=12 Papers	12X2=24	12X1=12
II. Elective Course (EC)			
A. Discipline Specific Elective	**(DSE A & B)**		
02 Courses from each of the 03 discipline of choice			
Theory	2X3=6 Papers	6X4=24	6X5=30
Practical/ Tutorial*	2X3=6 Papers	6X2=12	6X1=6
III. Ability Enhancement Compulsory Courses (AECC)			
1. English/ MIL Communication/ MIL+NH/ Business Communication for Commerce	1 Paper	1X2=2	1X2=2
2. Environmental Science	1 Paper	1x2=2	1x2=2
3. Skill Enhancement Course of the Core Course opted	**(SEC 1, 2, 3 & 4)** 4 Papers	4X2=8	4X2=8
	Total Credit = 120		**= 120**

Table A -2: Course structure for B.Sc. (Undergraduate Programme)

Semester	Course (Core Courses) 12 Papers	Allied (Elective Courses) 6 Papers	Ability Enhancement (Compulsory Courses) 6 Papers	Total Credits
Sem-I	DSC-1A, DSC-2A, DSC-3A (6+6+6=18 Credits)	---	Eng / Hindi Comm/ NH+MB (02 Credits)	**20 Credits**
Sem-II	DSC-1B, DSC-2B, DSC-3B (6+6+6=18 Credits)	---	EVS (02 Credits)	**20 Credits**
Sem-III	DSC-1C, DSC-2C, DSC-3C (6+6+6=18 Credits)	---	SEC-1 (02 Credits)	**20 Credits**
Sem-IV	DSC-1D, DSC-2D, DSC-3D (6+6+6=18 Credits)	---	SEC-2 (02 Credits)	**20 Credits**
Sem-V	---	DSE-1A, DSE-2A, DSE-3A (6+6+6=18 Credits)	SEC-3 (02 Credits)	**20 Credits**
Sem-VI	---	DSE-1B, DSE-2B, DSE-3B (6+6+6=18 Credits)	SEC-4 (02 Credits)	**20 Credits**
				Total = 120 Credits

COURSES OF STUDY FOR UNDERGRADUATE **'B. Sc. General'** PROGRAMME

Table A -3: Basic Course structure for SCIENCE (Undergraduate Programme) Total:120 Credits

Sem	Course (Core Courses)		Allied (Elective Courses)		Ability Enhancement (Compulsory Courses)	
	Code	4 x 3 = 12 Papers	Code	2 x 3 = 6 Papers	Code	1 + 1 + 4 = 6 Papers
I	DSC1A DSC2A DSC3A	Core Subject 1; Paper A Core Subject 2; Paper A Core Subject 3; Paper A			Compulsory Language Communication ENG/ MIL/ MIL+NH	
II	DSC1B DSC2B DSC3B	Core Subject 1; Paper B Core Subject 2; Paper B Core Subject 3; Paper B			EVS	Environmental Science
III	DSC1C DSC2C DSC3C	Core Subject 1; Paper C Core Subject 2; Paper C Core Subject 3; Paper C			SEC1	SEC1: Elementary Computer Application Softwares +**Lab**
IV	DSC1D DSC2D DSC3D	Core Subject 1; Paper D Core Subject 2; Paper D Core Subject 3; Paper D			SEC2	SEC2 of Either Core Subject 1,2 or 3
V			DSE1A DSE2A DSE3A	Core Subject 1 Core Subject 2 Core Subject 3	SEC3	SEC3 of same subject opted in Sem III
VI			DSE1B DSE2B DSE3B	Core Subject 1 Core Subject 2 Core Subject 3	SEC4	SEC4 of same subject opted in Sem III

Table A -4: Course structure for GEOLOGY (Undergraduate Programme) Total: 120 Credits

Semester	Course (Core Courses)		Allied (Elective Courses)		Ability Enhancement (Compulsory Courses)	
	Code	4 Papers	Code	2 Papers	Code	4 Papers
I	DSC-A	Physical & Structural Geology +**Lab**			Compulsory Language Communication	
II	DSC-B	Crystallography & Mineralogy +**Lab**			EVS	Environmental Science
III	DSC-C	Petrology +**Lab**			SEC1	Elementary Computer Application Softwares
IV	DSC-D	Stratigraphy & Paleontology +**Lab**			SEC2	Environmental Geology +**T**
V			DSE-A	Economic Geology & Hydrology +**Lab**	SEC3	Geochemistry +**T**
VI			DSE-B	Elements of Applied Geology +**Lab**	SEC4	Photogeology & Remote Sensing +**T**

Table A-5: Subject Combinations allowed for B. Sc. General Programme:

	Subject 1	Subject 2	Subject 3
1	Mathematics	Physics	Chemistry/ Geology
2	Mathematics	Chemistry	Geology
3	Botany	Zoology	Chemistry/ Geology

Table A-6: Semester wise Structure for Mid Sem & End Sem Examinations:

Sem	Core Honours, Allied DSE, Compulsory AECC Courses		Examination Structure		
	Code	Papers	Mid Semester Theory (F.M.)	End Semester Theory (F.M.)	End Semester Practical/ Viva (F.M.)
I	DSC-A	Physical & Structural Geology **+Lab**	---	75	25
	AECC	Language Communication	---	100	---
II	DSC-B	Crystallography & Mineralogy **+Lab**	---	75	25
	AECC	EVS	---	100	---
III	DSC-C	Petrology **+Lab**	---	75	25
IV	DSC-D	Stratigraphy & Paleontology **+Lab**	---	75	25
V	DSE-A	Economic Geology & Hydrology **+Lab**	---	75	25
VI	DSE-B	Elements of Applied Geology **+Lab**	---	75	25

Table A-7: Semester wise Structure for End Sem Examination of Skill Enhancement Course:

Sem	Skill Enhancement Course SEC		Examination Structure		
	Code	Papers	Mid Semester Theory (F.M.)	End Semester Theory (F.M.)	End Semester Practical/ Viva (F.M.)
III	SEC 1	Elementary Computer Application Software **+Lab**	---	100	---
IV	SEC 2	Electrical Circuit Network Skills **+Lab**	---	100	---
V	SEC 3	Basic Instrumentation Skills **+Lab**	---	100	---
VI	SEC 4	Renewable Energy & Energy Harvesting **+Lab**	---	100	---

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SEMESTER I 4 Papers

Total 100 x 4 = 400 Marks

I. ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

(Credits: Theory-02)

Any One Compulsory Language Communication Prescribed by Ranchi University:
English Communication/ Hindi Communication / NH + MB Communication

II. CORE COURSE –DSC-A: (Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	**Pass Marks: Th ESE = 30 + Pr ESE =10**

Instruction to Question Setter for
End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

PHYSICAL & STRUCTURAL GEOLOGY **Theory: 60 Lectures**

Unit-I: Introduction to geology and its scope, Earth and solar system: origin, size, shape, mass, density and its atmosphere.

Unit-II: A brief account of various theories regarding the origin and age of the earth; Brief idea of interior of earth and its composition.

Unit-III: Weathering and erosion: factors, types and their effects;

Unit-IV: Earthquakes: nature of seismic waves, their intensity and magnitude scale; Origin of earthquake; Volcanoes: types, products and causes of volcanism;.

Unit-V: Introduction to Structural Geology; contours, topographic and geological maps; Elementary idea of bed, dip and strike; Outcrop, effects of various structures on outcrop. Clinometer/Brunton compass and its use.

Unit-VI: Elementary idea of types of deformation; Folds: nomenclature and types of folds;

Unit-VII: Faults: nomenclature, geometrical and genetic classifications, normal, thrust and slip faults;

Unit-VIII: definition, kinds and significance of joints and unconformity.

GEOLOGY LAB- DSC A LAB

60 Lectures

Marks : 25 (Pr 3Hrs)=25	**Pass Marks: Pr ESE =10**

Instruction to Question Setter for

End Semester Practical Examination (ESE):

Distribution of Marks in Practical Examination:

Total = 25 Marks [Experiment = 15; Record = 5; Viva = 5]

Practicals:

1. **Physical Geology:**
   Study of important geomorphological models; Reading topographical maps of the Survey of India; Identification of geomorphic features.

2. **Structural Geology:**
   Study of clinometers/Brunton compass; Identification of different types of folds/faults from block models; Exercises on structural problems: preparation of cross section profile from a geological map.

Books Recommended:

- Arthur Holmes, 1992. Principles of Physical Geology. Chapman and Hall, London.
- Miller, 1949. An Introduction to Physical Geology. East West Press Ltd.
- Spencer, E.V., 1962. Basic concepts of Physical Geology. Oxford & IBH.
- Mahapatra, G.B., 1994. A text book of Physical geology. CBS Publishers.
- Billings, M.P., 1972. Structural Geology. Prentice Hall.
- Davis, G.R., 1984. Structural Geology of Rocks and Region. John Wiley
- Hills, E.S., 1963. Elements of Structural Geology. Farrold and Sons, London.
- Singh, R. P., 1995. Structural Geology, A Practical Approach. Ganga Kaveri Publ., Varanasi.
- A Practical Approach. Ganga Kaveri Publ., Varanasi.

SEMESTER II 4 Papers

Total 100 x 4 = 400 Marks

I. ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

(Credits: Theory-02)

Marks : 100 (ESE: 3Hrs) =100	**Pass Marks Th ESE = 40**

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **objective type test** consisting of hundred questions of 1 mark each. Examinees are required to mark their answer on **OMR Sheet** provided by the University.*

AECC – ENVIRONMENT STUDIES **Theory: 30 Lectures**

Unit 1 : Introduction to environmental studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

(2 lectures)

Unit 2 : Ecosystems

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :

  a. Forest ecosystem
  b. Grassland ecosystem
  c. Desert ecosystem
  d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(2 lectures)

Unit 3 : Natural Resources : Renewable and Non---renewable Resources

- Land resources and landuse change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water : Use and over---exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter---state).
- Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

(5 lectures)

Unit 4 : Biodiversity and Conservation

- Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega---biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity : Habitat loss, poaching of wildlife, man---wildlife conflicts, biological invasions; Conservation of biodiversity : In---situ and Ex---situ conservation of biodiversity.

- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

(5 lectures)

Unit 5 : Environmental Pollution

- Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management : Control measures of urban and industrial waste.
- Pollution case studies.

(5 lectures)

Unit 6 : Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

(4 lectures)

Unit 7 : Human Communities and the Environment

- Human population growth: Impacts on environment, human health and welfare.
- Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management : floods, earthquake, cyclones and landslides.
- Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

(3 lectures)

Unit 8 : Field work

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted site---Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems---pond, river, Delhi Ridge, etc.

(Equal to 4 lectures)

Suggested Readings:

- Raziuddin, M.., Mishra P.K. 2014, *A Handbook of Environmental Studies*, Akanaksha Publications, Ranchi.
- Mukherjee, B. 2011: *Fundamentals of Environmental Biology*.Silverline Publications, Allahabad.
- Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
- Gadgil, M., & Guha, R.1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
- Gleeson, B. and Low, N. (eds.) 1999.*Global Ethics and Environment*, London, Routledge.
- Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
- Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll.*Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.

- Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science,* 339: 36---37.
- McCully, P. 1996. *Rivers no more: the environmental effects of dams*(pp. 29---64). Zed Books.
- McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
- Odum, E.P., Odum, H.T. & Andrews, J. 1971.*Fundamentals of Ecology*. Philadelphia: Saunders.
- Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
- Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
- Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012.*Environment*. 8th edition. John Wiley & Sons.
- Rosencranz, A., Divan, S., & Noble, M. L. 2001. *Environmental law and policy in India*. *Tripathi 1992*.
- Sengupta, R. 2003. *Ecology and economics*: An approach to sustainable development. OUP.
- Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
- Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology*: *Voices from the Tropics*. John Wiley & Sons.
- Thapar, V. 1998. *Land of the Tiger*: *A Natural History of the Indian Subcontinent*.
- Warren, C. E. 1971. *Biology and Water Pollution Control*. WB Saunders.
- Wilson, E. O. 2006.*The Creation: An appeal to save life on earth*. New York: Norton.
- World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University

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II. CORE COURSE –DSC-B: (Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	**Pass Marks: Th ESE = 30 + Pr ESE =10**

Instruction to Question Setter for
End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

CRYSTALLOGRAPHY & MINERALOGY **Theory: 60 Lectures**

Unit-I: Crystals and their characters:

Unit-II: Crystal form, face, edge, solid angle; Interfacial angle and their measurements; Crystallographic axes and angles.

Unit-III: Crystal parameters, Weiss and Miller system of notations;

Unit-IV: Symmetry elements and description of normal class of Isometric, Tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems.

Unit-V: Introduction to Mineralogy, Definition and characters of mineral;

Unit-VI: Common physical properties of minerals; Chemical composition and diagnostic physical properties of minerals such as: Quartz, Orthoclase, Microcline, Hypersthene, Hornblende, Garnet, Muscovite, Biotite, Chlorite, Olivine, Epidote, Calcite.

Unit-VII: Polarizing microscope, its parts and functioning; Ordinary and polarized lights; Common optical properties observed under ordinary, polarized lights and crossed nicols.

Unit-VIII: Optical properties of some common rock forming minerals (Quartz, Orthoclase, Microcline, Olivine, Augite, Hornblende, Muscovite, Biotite, Garnet, Calcite).

GEOLOGY LAB- DSC B LAB

60 Lectures

Marks : 25 (Pr 3Hrs)=25	**Pass Marks: Pr ESE =10**

Instruction to Question Setter for

End Semester Practical Examination (ESE):

Distribution of Marks in Practical Examination:

Total = 25 Marks [Experiment = 15; Record = 5; Viva = 5]

Practicals:

1. **Crystallography:**
   Study of symmetry elements of normal class of Isometric, Tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems.

2. **Mineralogy:**
   Study of physical properties of minerals mentioned in theory course. Use of polarizing microscope; Study of optical properties of common rock forming minerals mentioned in theory course.
3. **Geological Field Training:**
   Students will be required to carry out 03 days field work in a suitable geological area to study the elementary aspects of field geology and submit a report thereon.

Books Recommended:

- Dana, E.S. and Ford, W.E., 2002. A textbook of Mineralogy (Reprints).
- Flint, Y., 1975. Essential of crystallography, Mir Publishers.
- Phillips, F.C., 1963. An introduction to crystallography. Wiley, New York.
- Berry, L.G., Mason, B. and Dietrich, R.V., 1982. Mineralogy. CBS Publ.
- Nesse, D.W., 1986. Optical Mineralogy. McGraw Hill.
- Read, H.H., 1968. Rutley's Element of Mineralogy (Rev. Ed.). Thomas Murby and Co.
- Berry and Mason, 1961. Mineralogy. W.H. Freeman & Co.
- Kerr, B.F., 1995. Optical Mineralogy 5th Ed. Mc Graw Hill, New York.

SEMESTER III 4 Papers

Total 100 x 4 = 400 Marks

I. SKILL ENHANCEMENT COURSE SEC 1: (Credits: Theory-02)

All Four Papers (One paper to be studied in each semester) of any One Subject to be opted from either of the Core Subjects opted for General Courses of Study. Refer Content from the Syllabus of opted Skill Enhancement Course Subject.

II. CORE COURSE –DSC-C: (Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	**Pass Marks: Th ESE = 30 + Pr ESE =10**

Instruction to Question Setter for
End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

PETROLOGY **Theory: 60 Lectures**

Igneous Petrology
Unit-I: Magma: definition, composition, types and origin; Forms of igneous rocks; textures of igneous rocks.

Unit-II: Reaction principle; Differentiation and Assimilation; Crystallization of unicomponent and bicomponent (mix-crystals); Bowen's reaction series.

Unit-III: Mineralogical and chemical classification of igneous rocks:.

Unit-IV: Detailed petrographic description of Granite, Granodiorite, Rhyolite, Syenite, Phonolite, Diorite, Gabbro.

Sedimentary Petrology
Unit-V: Processes of formation of sedimentary rocks; Classification, textures and structures of sedimentary rocks;

Unit-VI: Petrographic details of important siliciclastic and carbonate rocks such as - conglomerate, breccia, sandstone, greywacke, shale, limestones.

Metamorphic Petrology

Unit-VII: Process and products of. metamorphism; Type of metamorphism. Factors, zones and grade of metamorphism; Textures, structures and classification of metamorphic rocks.

Unit-VIII: Petrographic details of some important metamorphic rocks such as - slate,schists, gneiss, quartzite, marble.

GEOLOGY LAB- DSC C LAB 60 Lectures

Marks : 25 (Pr 3Hrs)=25	Pass Marks: Pr ESE =10

Instruction to Question Setter for

End Semester Practical Examination (ESE):

Distribution of Marks in Practical Examination:

Total = 25 Marks [Experiment = 15; Record = 5; Viva = 5]

Practicals:

1. **Igneous Petrology:**
   Identification of rocks: On the basis of their physical properties in hand specimen; and optical properties in thin sections.

2. **Sedimentary and metamorphic Petrology:**
   Identification of sedimentary and metamorphic rocks both in hand specimen and thin sections.

Books Recommended:

- Turner, F.J. & Verhoogen, J., 1960, Igneous & Metamorphic petrology. McGraw Hill Co.
- Bose, M.K., 1997. Igneous petrology. World press
- Tyrell, G. W., 1989. Principles of Petrology. Methuren and Co (Students ed.).
- Ehlers, WG, and Blatt, H., 1987. Petrology, Igneous, Sedimentary and Metamorphic rocks, CBS Publishers
- Moorhouse, WW., 1969. The study of rocks in thin sections. Harper and sons.
- Friedman & Sanders, 1978. Principles of Sedimentology. John Wiley and sons.
- Pettijohn, F.J., 1975. Sedimentary rocks, Harper & Bros. 3rd Ed.
- Prasad, C., 1980. A text book of sedimentology.
- Sengupta. S., 1997. Introduction to sedimentology. Oxford-IBH.
- Turner, F.J., 1980. Metamorphic petrology. McGraw Hill.
- Mason, R., 1978. Petrology of Metamorphic Rocks. CBS Publ.
- Winkler, H.G.C., 1967. Petrogenesis of Metamorphic Rocks. Narosa Publ

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SEMESTER IV 4 Papers

Total 100 x 4 = 400 Marks

I. SKILL ENHANCEMENT COURSE SEC 2: (Credits: Theory-02)

All Four Papers (One paper to be studied in each semester) of any One Subject to be opted from either of the Core Subjects opted for General Courses of Study. Refer Content from the Syllabus of opted Skill Enhancement Course Subject.

II. CORE COURSE –DSC-D: (Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	**Pass Marks: Th ESE = 30 + Pr ESE =10**

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

STRATIGRAPHY & PALEONTOLOGY Theory: 60 Lectures

Unit I: Definition, Principle of stratigraphy; Geological Time Scale and stratigraphic classification; Physiographic division of India.

Unit II: Study of following Precambrian succession: Dharwar,Singhbhum, Cuddapa, Vindhyan and Delhi Supergroups; Brief idea of Palaeozoic succession of northwestern Himalaya; Triassic of Spiti; Mesozoic type seccession of Kutch; Cretaceous of Tiruchirapalli;

Unit III: Study of following type localities: Gondwana and Deccan Trap.

Unit IV: Palaeogene-Neogene sequences of northwest Himalaya and Assam.

Unit-V: Palaeontology: definition, Fossils: definition, characters, binomial nomenclature in taxonomy, mode of preservation, condition of fossilization and significance of fossils;.

Unit VI: Morphology and geological distribution of brachiopods, pelecypods, cephalopods.

Unit VII: Morphology and geological distribution of trilobite, echinoidea.

Unit VIII: Evolutionary history of horse; Morphology, distribution and significance of Gondwana flora.

GEOLOGY LAB- DSC D LAB

60 Lectures

Marks : 25 (Pr 3Hrs)=25	**Pass Marks: Pr ESE =10**

Instruction to Question Setter for

End Semester Practical Examination (ESE):

Distribution of Marks in Practical Examination:

Total = 25 Marks [Experiment = 15; Record = 5; Viva = 5]

Practicals:

1. Morphological characters, systematic position and age of fossil genera pertaining to brachiopods, pelecypods, cephalopods, trilobite and Echinacea.
2. Preparation of lithostratigraphic maps of India showing distribution of important geological formations.

Books Recommended:

- Wadia, D., 1973. Geology of India. Mc Graw Hill Book co.
- Krishnan, M.S., 1982. Geology of India and Burma, 6th Edition. CBS Publ.
- Ravindra Kumar, 1985. Fundamentals of Historical Geology & Stratigraphy of India. Wiley Eastern.
- Shrock, R.R. & Twenhoffel, W.H., 1952. Principles of Invertebrate Paleontology. CBS Publ.
- Swinerton, HH., 1961. Outlines of Paleontology. Edward Arnold Publishers
- Jain, P.C. & Anantharaman, M.S., 1983. Paleontology: Evolution & Animal Distribution. Vishal Publ.
- Lehmann, U., 1983. Fossil Invertebrate. Cambridge Univ. Press.
- Rastogi, 1988. Organic evolution. Kedrnath and Ramnath Publ.

SEMESTER V **4 Papers**

Total 100 x 4 = 400 Marks

I. SKILL ENHANCEMENT COURSE SEC 3: (Credits: Theory-02)

All Four Papers (One paper to be studied in each semester) of any One Subject to be opted from either of the Core Subjects opted for General Courses of Study. Refer Content from the Syllabus of opted Skill Enhancement Course Subject

II. GEOLOGY SPECIFIC –DSE A: (Credits: Theory-05, Tutorials-01)

Marks : 75 (ESE: 3Hrs) =75	**Pass Marks: Th (ESE) = 30**

Instruction to Question Setter for
Mid Semester Examination (MSE):

*There will be **two** group of questions. **Group A is compulsory** and will contain five questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type** six questions of five marks each, out of which any four are to answer.*

ECONOMIC GEOLOGY & HYDROLOGY

Theory: 75 Lectures Tutorial: 15 Lectures

Unit-I: Concept of ore and ore deposits, ore minerals and gangue minerals; Tenor of ores; Metallic and non-metallic ore minerals; Strategic, Critical and essential minerals.

Unit-II: Processes of formation of ore deposits; Magmatic, contact metasomatic, hydrothermal, sedimentation, Residual.

Unit-III: Study of important metallic (Cu, Pb, Zn Mn, Fe, Au, Al) and non-metallic (industrial) minerals (gypsum, magnesite, mica).

Unit-IV: Distribution of coal and petroleum in India;

Unit-V: Definition of hydrogeology, Hydrological cycle;

Unit-VI: Hydrological parameters - Precipitation, evaporation, transpiration and infiltration.

Unit-VII: Origin of groundwater; Vertical distribution of groundwater; Types of aquifers; Water bearing properties of rocks - Porosity and Permeability; specific yield, specific retention.

Unit-VIII: Surface and subsurface geophysical and geological methods of ground water exploration; Groundwater provinces of India.

GEOLOGY LAB- DSE A LAB

60 Lectures

Marks : 25 (Pr 3Hrs)=25	**Pass Marks: Pr ESE =10**

Instruction to Question Setter for

End Semester Practical Examination (ESE):

Distribution of Marks in Practical Examination:

Total = 25 Marks [Experiment = 15; Record = 5; Viva = 5]

Practicals:

1. **Economic Geology**:
   Study of ore and economic minerals in hand specimen; Preparation of maps showing distribution of important metallic and non-metallic deposits and important coal and oil fields of India.

2. **Hydrology:**
   Study of hydro-geological models, Estimation of porosity and permeability from the given data;
   Preparation and interpretation of water table maps.

Books Recommended:

- Brown, C. and Dey, A.K.1955. Indian Mineral Wealth. Oxford Univ.
- Gokhale, K.V.G.K. and Rao, T.C., 1983. Ore Deposits of India. East West Press Pvt. Ltd.
- Jense, M.L. and Bateman A.M., 1981. Economic Mineral Deposits. John Wiley and Sons.
- Krishnnaswamy, S., 1979. India's Minerals Resources. Oxford and IBH Publ.
- Deb, S., 1980. Industrial minerals and Rocks of India. Allied Publishers Pvt. Ltd.
- Umeshwar Prasad, 2003. Economic Geology. CBS Publishers and distributers.
- Sharma, N.L. and Ram, K.V.S., 1972. Introduction to India's Economic Minerals, Dhanbad.
- Karanth, K. R., 1989. Hydrogeology. Tata McGraw Hill Publ.
- Raghunath, H. M., 1990. Groundwater. Wiley Eastern Ltd.
- Subramaniam, V., 2000. Water-Kingston Publ. London.

SEMESTER VI 4 Papers

Total 100 x 4 = 400 Marks

I. SKILL ENHANCEMENT COURSE SEC 4: (Credits: Theory-02)

All Four Papers (One paper to be studied in each semester) of any One Subject to be opted from either of the Core Subjects opted for General Courses of Study. Refer Content from the Syllabus of opted Skill Enhancement Course Subject

II. GEOLOGY SPECIFIC –DSE B: (Credits: Theory-04, Practicals-02)

Marks : 25 (MSE: 1Hr) + 75 (ESE: 3Hrs) =100	**Pass Marks: Th (MSE +ESE) = 40**

Instruction to Question Setter for
Mid Semester Examination (MSE):

*There will be **two** group of questions. **Group A is compulsory** and will contain five questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type** six questions of five marks each, out of which any four are to answer.*

ELEMENTS OF APPLIED GEOLOGY **Theory: 75 Lectures**

Unit-I: Engineering properties of rocks and Soils.

Unit-II: Soil and Soil groups of India.

Unit-III: Dam, Types and their geological and environmental considerations; Geological problem of reservoirs.

Unit-IV: Tunnels: geology, structure, seepage problem and role of water table;

Unit-V: Landslides: classification, causes and preventative measures.

Unit-VI: Mineral exploration: Elementary idea of geological and geophysical prospecting.

Unit-VII: Elementary idea of mining.

Unit-VIII: Environmental considerations for mining,

GEOLOGY LAB- DSE B LAB

60 Lectures

Marks : 25 (Pr 3Hrs)=25	**Pass Marks: Pr ESE =10**

Instruction to Question Setter for

End Semester Practical Examination (ESE):

Distribution of Marks in Practical Examination:

Total = 25 Marks [Experiment = 15; Record = 5; Viva = 5]

Practicals:

1. Surveying by Plane Table; Preparation of engineering geological maps; Engineering properties and identification of building stones. Identification of various models of landslide, tunnel and dam. Study of soil profiles.

Books Recommended:

- Valdiya, K.S., 1987. Environmental Geology – Indian Context. Tata McGraw Hill.
- Rajendran S., 2007. Mineral Exploration : Recent Strategies.
- Dobrin, M.B. & Savit, CH., 1988. Introduction to Geophysical Prospecting, McGraw-Hill.
- Arogyaswamy, R.N.P., 1973. Courses in Mining Geology. Oxford and IBH Publ.
- Parasins, D.S., 1997. Principles of applied geophysics. Chapman Hall.
- Krynine D.P. and Judd W.R., 1957. Principles of Engineering Geology & Geotechnics. McGraw-Hill Book
- Kesavulu, N.C., 2009. A text book of engineering geology. Macmillan P publishing India Ltd.
- Crozier. M.J., 1989. Landslides: causes, consequences and environment. Academic Press.
- Readman, J.H., 1979. Techniques in Mineral exploration. Applied Science Publishres.
- Bell, F.G., 1983. Fundamentals of Engineering Geology. Butterworth and Co.

COURSES OF STUDY FOR **SKILL ENHANCEMENT COURSE 'B. Sc. General'**
PROGRAMME IN **"GEOLOGY"**

SEMESTER III **SKILL ENHANCEMENT COURSE** **1 Paper**

Total 100 x 1 = 100 Marks

I. SKILL ENHANCEMENT COURSE - SEC 1: (Credits: Theory-02)

Marks : 100 (ESE: 3Hrs) =100	**Pass Marks Th ESE = 40**

Instruction to Question Setter for
End Semester Examination (ESE):

*There will be **objective type test** consisting of hundred questions of 1 mark each. Students are required to mark their answer on **OMR Sheet** provided by the University.*

ELEMENTARY COMPUTER APPLICATION SOFTWARES:

A Common Syllabus Prescribed by Ranchi University **Theory: 30 Lectures**

Objective of the Course

The objective of the course is to generate qualified manpower in the area of Information Technology (IT) and Graphic designing which will enable such person to work seamlessly at any Offices, whether Govt. or Private or for future entrepreneurs in the field of IT.

A. INTRODUCTION TO COMPUTER SYSTEM

Basic Computer Concept

Computer Appreciation - Characteristics of Computers, Input, Output, Storage units, CPU, Computer System. **(1 Lecture)**

Input and Output Devices

Input Devices - Keyboard, Mouse, joystick, Scanner, web cam,
Output Devices- Soft copy devices, monitors, projectors, speakers, Hard copy devices, Printers – Dot matrix, inkjet, laser, Plotters. **(4 lectures)**

Computer Memory and Processors

Memory hierarchy, Processor registers, Cache memory, Primary memory- RAM, ROM, Secondary storage devices, Magnetic tapes, Floppy disks, hard disks, Optical Drives- CD-ROM, DVD-ROM, CD-R, CD-RW, USB Flash drive, Mass storage devices: USB thumb drive. Managing disk Partitions, File System. Basic Processor Architecture, Processor speed, Types of processor.

(5 lectures)

Numbers Systems and Logic Gates

Decimal number system, Binary number system, Octal number system, Hexadecimal number system, Inter-conversion between the number systems. Basic Logic gates-AND, OR, NOT, Universal logic gates- NAND, NOR **(3 lectures)**

Computer Software

Computer Software- Relationship between Hardware and Software, System Software, Application Software, Compiler, Names of some high level languages, Free domain software. **(2 Lectures)**

Internet & its uses

History of Internet, WWW and Web Browsers: Web Browsing software, Surfing the Internet, Chatting on Internet, Basic of electronic mail, Using Emails, Document handling, Network definition, Common terminologies: LAN, WAN, MAN, Node, Host, Workstation, Bandwidth, Network Components: Severs, Clients, Communication Media. Wireless network

(3 Lectures)

Operating system-Windows

Operating system and basics of Windows, The User Interface, Using Mouse and Moving Icons on the screen, The My Computer Icon, The Recycle Bin, Status Bar, Start and Menu & Menu-selection, Running an Application, Windows Explorer Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows, Windows Setting, Control Panels, Wall paper and Screen Savers, Setting the date and Sound, Concept of menu Using Help, Advanced Windows, Using right Button of the Mouse, Creating Short cuts, Basics of Window Setup, Notepad, Window Accessories

(2 Lectures)

B. MICROSOFT OFFICE 2007 AND LATEST VERSIONS

Word Processing

Word processing concepts: saving, closing, Opening an existing document, Selecting text, Editing text, Finding and replacing text, printing documents, Creating and Printing Merged Documents, Character and Paragraph Formatting, Page Design and Layout. Editing and Checking. Correcting spellings. Handling Graphics, Creating Tables and Charts, Document Templates and Wizards, Mail merge and Macros.

(3 Lectures)

Microsoft Excel (Spreadsheet)

Spreadsheet Concepts, Creating, Saving and Editing a Workbook, Inserting, Deleting Work Sheets, entering data in a cell / formula Copying and Moving from selected cells, handling operators in Formulae, Functions: Mathematical, Logical, statistical, text, financial, Date and Time functions, Using Function Wizard. Formatting a Worksheet: Formatting Cells changing data alignment, changing date, number, character or currency format, changing font, adding borders and colors, Printing worksheets, Charts and Graphs – Creating, Previewing, Modifying Charts. Integrating word processor, spread sheets, web pages. Pivot table, goal seek, Data filter and scenario manager

(4 Lectures)

Microsoft Power Point (Presentation Package)

Creating, Opening and Saving Presentations, Creating the Look of Your Presentation, Working in Different Views, Working with Slides, Adding and Formatting Text, Formatting Paragraphs, Drawing and Working with Objects, Adding Clip Art and other pictures, Designing Slide Shows, Running and Controlling a Slide Show, Printing Presentations. Creating photo album, Rehearse timing and record narration. Master slides. **(3 Lectures)**

Reference Books

- Nishit Mathur, Fundamentals of Computer , Aph publishing corporation(2010)
- Misty E. Vermaat,.Microsoft word 2013 1st Edition (2013).
- Satish Jain, M.Geeta, MS- Office 2010 Training Guide, BPB publication (2010)
- Joan Preppernau, Microsoft PowerPoint 2016 step by step, Microsoft press(2015)
- Douglas E Corner, The Internet Book 4th Edition, prentice –Hall(2009)
- Faithe wempen, word 2016 in depth 1st edition, que publishing(2015)
- Steven welkler, Office 2016 for beginners, Create Space Independent publishing Plateform (2016)

SKILL ENHANCEMENT LAB- SEC 1 LAB

A. MS-WORD LAB ASSIGNMENT

1. Write down the following Paragraph OR any one provided by your teacher;

Without a doubt, the Internet is one of the most important inventions of modern times. The Internet is a global interconnected computer networks which allow each connected computer to share and exchange information with each other. The origins of the Internet can be traced to the creation of Advanced Research Projects Agency Network (ARPANET) as a network of computers under the auspices of the U.S. Department of Defense in 1969.

Apply following effects on The paragraph:

i. Paragraph **font-size** and **font-type** must be 12 Verdana.
ii. Paragraph **alignment** must be justified and double line spacing.
iii. **Highlight** the "(ARPANET)" with green color.
iv. Make the "Internet" keywords **Bold and Italic**.
v. Insert any "**WordArt**" and a **symbol** to your document.
vi. Insert a **clipart** to your document.
vii. Add following lines to your document:
Internet, Intranet, Extranet, URL, WWW, Networking, Protocols, HTTP, TCP/IP

2. Create a Table of following fields:

Name, Surname, Age, Gender, Job and apply the following effects

i. Insert 10 records
ii. Font size should be 12
iii. Title size should be 14
iv. Font type should be Times new Roman
v. Title color should be blue
vi. Text color should be black
vii. Table border should be 2

3. Write a letter on 'Road Safety' and send to 'Multiple Recipients' using mail merge.

4. Type the paragraph given below:

Today, the Internet is a public, cooperative and self-sustaining facility accessible to hundreds of millions of people worldwide. Physically, the Internet uses a portion of the total resources of the currently existing public telecommunication networks. Technically, what distinguishes the Internet is its use of a set of protocols called TCP/IP (for Transmission Control Protocol/Internet Protocol). Two recent adaptations of Internet technology, the intranet and the extranet, also make use of the TCP/IP protocol. Today, the Internet is a public, cooperative and self-sustaining facility accessible to hundreds of millions of people worldwide. Physically, the Internet uses a portion of the total resources of the currently existing public telecommunication networks. Technically, what distinguishes the Internet is its use of a set of protocols called TCP/IP (for Transmission Control Protocol/ Internet Protocol). Two recent adaptations of Internet technology, the intranet and the extranet, also make use of the TCP/IP protocol.

Apply the following:

i. Change Internet into Internets at a time
ii. Heilight TCP/IP in red color
iii. Replace protocol into protocols
iv. Find the word "Public"

B. MICROSOFT EXCEL LAB ASSİGNMENT

Basic Formatting and Spreadsheet Manipulation

1. Add rows and columns to an existing spreadsheet
2. Reformat data (center, comma and currency styles, bold, text color)
3. Work with a simple formula (product) and function (sum)

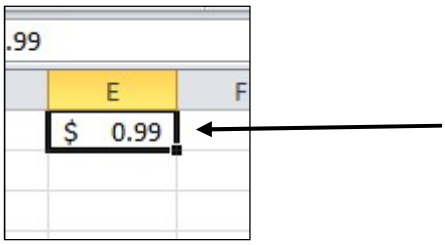
Assignment

1. Create a workbook as shown below.
2. To enter new rows or columns, simply click on the row or column header to select the whole row or column. Then right click with the mouse and choose insert.
3. Add the new row for S Spade with the data that's shown below (between the original rows 7 and 8).
4. Add a column for gender and the data as shown below (between the original columns A and B). Enter the appropriate gender for yourself in the last row.

A	B	C	D
Name	**Male/Female**	**Genre**	**Number of Songs**
J Smith	F	Blues	50
B Doe	M	Country	110
S Spade	F	Country	200
F Zappa	M	Blues	1400
F Zappa	M	Alternative	2300
J Smith	F	Alternative	150
S Spade	F	Blues	1000
B Doe	M	Blues	75
yourname	M	Blues	800

5. Center the data in columns B and C. Do this by selecting the whole column and click the center icon on the ribbon.
6. Bold the data in row 1, the column headings (ensure that the data all remains visible within the column boundaries).
7. Change the font color for row 1 to Blue.
8. Change the format of the data in column D to comma style (no decimal places showing).There is an icon on the home tab that sets it to comma style easily.
9. Add two new column labels to the right of the current columns; **Unit Price** and **Total Cost**. (They will be in columns E and F.) These two columns of data should be currency type so that the dollar sign is shown. There is an icon to quickly format the selected column as currency type.
10. All tunes are $.99, so enter that value for all rows in Column E. You can copy quickly by using the **Auto Fill** handle and drag that amount down. When you over your mouse over the tiny square in

the bottom right hand corner of the active cell, your mouse shape will become a skinny plus sign, and you can click and drag that cell to make a copy.



11. Calculate Total Cost (column F) as *column D times Column E*. You will type in a formula like this into cell F2: **=D2*E2** (Be sure to begin the formula with an equal sign)
12. Use the AutoFill (skinny plus sign) again to copy the formula down column F; down to F10. Double check the picture below to make sure yours has the correct values
13. Add a border to all of the cells (A1-f10) using the Borders tool in the Fonts group on the Home Tab.
14. Change the page layout to landscape. Do this by clicking the Page Layout tab on the ribbon and then to Orientation to Landscape.
15. Save the file.
16. Click in cell F11 and Use the sum function or the shortcut icon that looks like ∑ to get the total of the Total Cost column.
17. Ensure that the data is all visible within the column boundaries. Make the columns wider if needed.
18. Save the workbook. Your final spreadsheet should look like the following when printed.

Name	Male/Female	Genre	Number of Songs	Unit Price	Total Cost
J Smith	F	Blues	50	$ 0.99	$ 49.50
B Doe	M	Country	110	$ 0.99	$ 108.90
S Spade	F	Country	200	$ 0.99	$ 198.00
F Zappa	M	Blues	1,400	$ 0.99	$ 1,386.00
F Zappa	M	Alternative	2,300	$ 0.99	$ 2,277.00
S Spade	F	Blues	1,000	$ 0.99	$ 990.00
J Smith	F	Alternative	150	$ 0.99	$ 148.50
B Doe	M	Blues	75	$ 0.99	$ 74.25
yourname	M	Blues	800	$ 0.99	$ 792.00
					$ 6,024.15

Create a sample table given below in Excel

- Using formula find Total
- Find the maximum value using MAX function from the **Units** column
- Find minimum value from **Total** column

Order Date	Region	Rep	Item	Units	Unit Cost	Total
1/6/2016	East	Jones	Pencil	95	1.99	189.05
1/23/2016	Central	Kivell	Binder	50	19.99	999.50
2/9/2016	Central	Jardine	Pencil	36	4.99	179.64
2/26/2016	Central	Gill	Pen	27	19.99	539.73
3/15/2016	West	Sorvino	Pencil	56	2.99	167.44
4/1/2016	East	Jones	Binder	60	4.99	299.40
4/18/2016	Central	Andrews	Pencil	75	1.99	149.25
5/5/2016	Central	Jardine	Pencil	90	4.99	449.10
5/22/2016	West	Thompson	Pencil	32	1.99	63.68
6/8/2016	East	Jones	Binder	60	8.99	539.40
6/25/2016	Central	Morgan	Pencil	90	4.99	449.10
7/12/2016	East	Howard	Binder	29	1.99	57.71
7/29/2016	East	Parent	Binder	81	19.99	1,619.19
8/15/2016	East	Jones	Pencil	35	4.99	174.65
9/1/2016	Central	Smith	Desk	2	125.00	250.00
9/18/2016	East	Jones	Pen Set	16	15.99	255.84
10/5/2016	Central	Morgan	Binder	28	8.99	251.72
10/22/2016	East	Jones	Pen	64	8.99	575.36
11/8/2016	East	Parent	Pen	15	19.99	299.85
11/25/2016	Central	Kivell	Pen Set	96	4.99	479.04
12/12/2016	Central	Smith	Pencil	67	1.29	86.43
12/29/2016	East	Parent	Pen Set	74	15.99	1,183.26

C. MS-POWERPOINT LAB ASSIGNMENT

Activity 1 : Using Text & Background/Themes

i. Create one new slide and insert any text.
ii. To make your slide more attractive, use the themes or background.
iii. Make sure it apply for every slide not only one slide.

Activity 2 : Apply Custom Animation On Text

i. Use the custom animation to add effects on your text. Set the text move after you click the mouse.
ii. If you have more than one text, add effects for each of text.

Activity 3 : Insert Image & WordArt

i. Insert one new blank slide.
ii. Choose one pictures or clip art from any source and insert in your new slide.
iii. Using the WordArt, make a note or title on your picture.
iv. Use the custom animation again to add effects on your picture and WordArt.

Activity 4 : Insert Text Box

i. Insert one new blank slide.
ii. Use the text box to insert one paragraph of text and adjust your text.

Activity 5 : Insert Smart Art

i. Insert one new blank slide.
ii. Insert the Smart Art and put your text on the Smart Art.

Activity 6 : Insert Audio

i. Back to your first slide and insert one audio on that slide. The audio must play automatically when you show your slide.
ii. Make sure the speaker also not appear when you show your slide. (the icon).
iii. The audio must play when you show alls your slide, not only one slide.

Activity 7 : inserting Video

i. Insert one new slide and insert one short video

Activity 8 : Save File

i. Save your file

Activity 9 : Create Photo Album & Hyperlink

i. Insert one new slide and put a text ex: “My Photo Album”
ii. Create one photo album and adjust your text and your photos
iii. Save your photo album with a new file
iv. Make a hyperlink to your photo using the text “My Photo Album”

Reference Books:

- Faithe wempen, word 2016 in depth 1st edition, que publishing(2015)
- steven welkler, Office 2016 for bignners, Create Space Independent publishing plateform(2016)
- Elaine Marmel, office 2016 simplified, 1st Edition, John wiley and sons Inc(2016)
- Patrice-Anne Rutledge, Easy office 2016 1st edition, Que publishing(2016)

SEMESTER IV **SKILL ENHANCEMENT COURSE** **1 Paper**

Total 100 x 1 = 100 Marks

II. SKILL ENHANCEMENT COURSE- SEC 2: (Credits: Theory-02)

Marks : 100 (ESE 3Hrs) =100	**Pass Marks Th ESE = 40**

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain three questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 & 3 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of 20 marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

ENVIRONMENTAL GEOLOGY **30 Lectures**

Geomorphology and Geotectonics

Unit-I: Basic principles of Geomorphology, geomorphological cycles, weathering and erosion; Geomorphic mapping- tools and techniques.

Unit-II: Epigene/exogenic processes: degradation and aggradation. Hypogene/endogenic processes; Diastrophism and volcanism, Extraterrestrial processes; Geological work of wind, glacier, river, underground water and ocean.

Unit-III: Earth as a dynamic system. Elementary idea of continental drift, sea-floor spreading and mid-oceanic ridges. Paleomagnetism and its application.

Unit-IV: Plate Tectonics: the concept, plate margins, orogeny, deep sea trenches, island arcs and volcanic arcs.

Books Recommended:

- Allen, P., 1997. Earth Surface Processes. Blackwell
- Bloom, A.L., 1998. Geomorphology: A systematic Analysis of Late Cenozoic Landforms (3rd Edition).
- Pearson Education, Inc.
- Keary, P. and Vine, F.J., 1997. Global Tectonics. Blackwell and crustal evolution. Butterworth-Heinemann.
- Kale, V.S. and Gupta, A., 2001. Introduction to Geomorphology. Orient Longman Ltd.
- Moores, E and Twiss. R.J., 1995. Tectonics. Freeman.
- Patwardhan, A. M., 1999. The Dynamic Earth System. Prentice Hall.
- Summerfied, M.A., 2000. Geomorphology and Global tectonic. Springer Verlag.
- Valdia, K.S., 1988. Dynamic Himalaya. Universities Press, Hyderabad.
- WD Thornbury, 2002. Principles of Geomorphology. CBS Publ. New Delhi.

SEMESTER V **SKILL ENHANCEMENT COURSE** **1 Paper**

Total 100 x 1 = 100 Marks

III. SKILL ENHANCEMENT COURSE- SEC 3: (Credits: Theory-02)

Marks : 100 (ESE 3Hrs) =100	**Pass Marks Th ESE = 40**

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain three questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 & 3 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of 20 marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

GEOCHEMISTRY **30 Lectures**

Unit-I: Earth and its spheres: atmosphere, hydrosphere, lithosphere, biosphere and Man; Earth Material.

Unit-II: Energy budget: Solar radiation; Global environments: coastal, riverine, desertic, tropical, cold, polar; Concept of global warming and climate change.

Unit-III: Geoloigcal hazards: Earthquakes, volcanism, landslides, avalanches, floods, droughts; Hazard mitigation.

Unit IV: Resource Management: Energy resources (Conventional and non-conventional), watershed management, landuse planning, management of water resources, land reclamation.

Books Recommended:

- Verma, V.K., 1986. Geomorphology Earth surface processes and form. McGraw Hill.
- Chorley, R. J., 1984. Geomorphology. Methuen.
- Selby, M.J., 1996. Earths Changing Surface. Oxford University Press UK.
- Thornbury W. D., 1997. Principles of Geomorphology Wiley Eastern Ltd., New Delhi.
- Valdiya, K. S., 1987. Environmental Geology - Indian Context. Tata McGraw Hill New Delhi.
- Keller, E. A., 2000. Environmental Geology. Shales E. Merril Publishing Co., Columbus, Ohio.
- Montgomery, C., 1984. Environmental Geology. John Wiley and Sons, London.
- Bird, Eric, 2000. Coastal Geomorphology: An Introduction. John Wiley & Sons, Ltd. Singapore.
- Liu, B.C., 1981. Earthquake Risk and Damage, Westview.

SEMESTER VI **SKILL ENHANCEMENT COURSE** **1 Paper**

Total 100 x 1 = 100 Marks

IV. SKILL ENHANCEMENT COURSE- SEC 4: (Credits: Theory-02)

Marks : 100 (ESE 3Hrs) =100	**Pass Marks Th ESE = 40**

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain three questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 & 3 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of 20 marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

PHOTOGEOLOGY & REMOTE SENSING **30 Lectures**

Unit-I: Introduction to geochemistry: basic knowledge about crystal chemistry. Types of chemical bonds, coordination number; Colloids in geological systems, ion exchanges and geological evidence for earlier colloids; Elementary idea of Periodic Table.

Unit-II: Cosmic abundance of elements; Composition of the planets and meteorites; Geochemical evolution of the earth and geochemical cycles;

Unit-III: Gold Schmidt's geochemical classification of elements; Distribution of major, minor and trace elements in igneous, metamorphic and sedimentary rocks.

Unit-IV: Elements of geochemical thermodynamics; Isomorphism and polymorphism; Isotope geochemistry.

Books Recommended:

- Hoefs, J., 1980. Stable Isotope Geochemistry. Springer-Verlag.
- Klein, C. and Hurlbut, C.S., 1993. Manual of Mineralogy. John Viley and Sons, New York.
- Krauskopf, K.B., 1967. Introduction to Geochemistry. McGraw Hill.
- Mason, B. and Moore, C.B., 1991. Introduction to Geochemistry. Wiley Eastern.
- Rollinson, H.R., 1993. Using geochemical data: Evaluation, Presentation, and Interpretation. Longman

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SAMPLE CALCULATION FOR SGPA & CGPA FOR UNDERGRADUATE **'B.Sc./B.A./B.Com General'** PROGRAMME

Distribution of Credits Semester wise for Undergraduate Courses

Table B-1: UG (B.A./ B.Sc./B.Com. Programme)

Semester wise distribution of 120 Credits

	CC	AECC	GE	SEC	DSE	Total Credits
Semester I	18	02				20
Semester II	18	02				20
Semester III	18			02		20
Semester IV	18			02		20
Semester V				02	18	20
Semester VI				02	18	20
	72	**04**		**08**	**36**	**120**

CC=Core Course; AECC=Ability Enhancement Compulsory Course; GE=Generic Elective; SEC=Skill Enhancement Course; DSE=Discipline Specific Elective

Table B-2: Sample calculation for SGPA for B.A./B.Sc./B.Com. Program

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit X Grade)	SGPA (Credit Point/Credit)
Semester I					
DSC - 1A	06	B	6	36	
DSC - 2A	06	B+	7	42	
DSC - 3A	06	C	5	30	
AECC – 1	02	**B**	6	12	
Total	**20**			**120**	**6.0 (120/20)**
Semester II					
DSC - 1B	06	B	6	36	
DSC - 2B	06	B	6	36	
DSC - 3B	06	C	5	30	
AECC – 2	02	A+	9	18	
Total	**20**			**120**	**6.0 (120/20)**
Semester III					
DSC - 1C	06	A	8	48	
DSC - 2C	06	A+	9	54	
DSC - 3C	06	A	8	48	
SEC – 1	02	A	8	16	
Total	**20**			**166**	**8.3 (166/20)**
Semester IV					
DSC - 1D	06	C	5	30	
DSC - 2D	06	B	6	36	
DSC - 3D	06	B+	7	42	
SEC - 2	02	A+	9	18	
Total	**20**			**126**	**6.3 (126/20)**
Semester V					
DSE - 1A	06	B	6	36	
DSE - 2A	06	A+	9	54	
DSE - 3A	06	A	8	48	
SEC – 3	02	B	6	12	
Total	**20**			**150**	**7.5 (150/20)**
Semester VI					
DSE - 1B	06	B+	7	42	
DSE - 1B	06	B	6	36	
DSE - 1B	06	C	5	30	
SEC - 4	02	C	5	10	
Total	**20**			**118**	**5.9 (118/20)**
CGPA					
Grand Total	**120**			**800**	**6.67 (800/120)**

Table B- 3: Sample calculation for CGPA for B.A./B.Sc./B.Com. Program

Semester I	Semester II	Semester III	Semester IV	Semester V	Semester VI
Credit:20; SGPA: 6.0	**Credit:20; SGPA: 6.0**	**Credit:20; SGPA: 8.3**	**Credit:20; SGPA: 6.3**	**Credit:20; SGPA: 7.5**	**Credit:20; SGPA: 5.9**

Thus CGPA= (20x6.0+20x6.0+20x8.3+20x6.3+20x7.5+20x5.9)/120**=6.67**

MARKS DISTRIBUTION FOR EXAMINATIONS AND FORMAT OF QUESTION PAPERS

Marks Distribution of End Semester Theory Examinations:

Table No. C1: Marks distribution of Theory Examinations of End Semester

Topic	Code	Full Marks	Pass Marks	Time	Group-A# (Very short answer type Compulsory Questions) No. of Questions x Marks = F.M.	Group-B (Descriptive Questions with Choices) No. of Questions x Marks = F.M.	Total No. of Questions to Set	
							Group A#	Group B
End Sem	T75	75	30	3 Hrs	Q.No.1 (10x1) + 1x5 =15	4 (out of 6) x15 =60	2	6
	T100	100	40	3 Hrs	Q.No.1 (10x1) + 2x5 =20	4 (out of 6) x20 =80	3	6
	T50 +T50	50X2=100	20	3 Hrs	2 x5 =10	2 (out of 3) x20 =40	2	3

 # Question No.1 in Group-A carries 10 very short answer type 1 Mark Questions.

Marks Distribution of Mid/End Semester Practical Examinations:

Table No. C2: Marks distribution of Practical Examinations of End Semester

Topic	Code	Full Marks	Pass Marks	Time	Distribution of Marks			Total No. of Questions to Set
					Experiment	Record	Viva	
End Sem	P25	25	10	3 Hrs	15	5	5	
	P50	50	20	3 Hrs	30	10	10	Pr. with components of both papers
	P75	75	30	3 Hrs	45	15	15	Pr. with components of all three papers
	P100	100	40	3 Hrs	60	20	20	Pr. with components of all four papers

Abbreviations : T= Theory Examination, **P**= Practical Examination.

Mid Sem* **:** There will be 15 Marks Theory Examination in Practical Subjects and 25 Marks Theory Examination in Non-Practical Subjects/ Papers. 25 Marks Theory Examination may include 10 Marks questions from Assignment/ Project/ Tutorial where ever applicable.

Note **:** There may be subdivisions in each question asked in Theory Examinations.

FORMAT OF QUESTION PAPER FOR END SEM EXAMINATION

OF

AECC NH + MB COMMUNICATION

Ranchi University, Ranchi

End Sem No. Exam Year

Subject/ Code

F.M. =50 **P.M.**=20 **Time**=1.5Hrs.

General Instructions:

i. **Group A** carries short answer type **compulsory** questions.
(खंड 'A' में लघु उत्तरीय अनिवार्य प्रश्न हैं।)

ii. **Answer 2 out of 3** subjective/ descriptive questions given **in Group B**.
(खंड 'B' के तीन में से किन्हीं दो विषयनिष्ठ/ वर्णनात्मक प्रश्नों के उत्तर दें।)

iii. Answer in your own words as far as practicable.
(यथासंभव अपने शब्दों में उत्तर दें।)

iv. Answer all sub parts of a question at one place.
(एक प्रश्न के सभी भागों के उत्तर एक साथ लिखें।)

v. Numbers in right indicate full marks of the question.
(पूर्णांक दायीं ओर लिखे गये हैं।)

Group A

1. ..... [5]
2. ..... [5]

Group B

3. ..... [20]
4. ..... [20]
5. ..... [20]

Note: There may be subdivisions in each question asked in Theory Examination.

FORMAT OF QUESTION PAPER FOR END SEM EXAMINATION

OF

SUBJECTS WITHOUT PRACTICAL

Ranchi University, Ranchi

End Sem No. Exam Year

Subject/ Code

F.M. =75 **P.M.**=40 (Including Mid Sem) **Time**=3Hrs.

General Instructions:

i. **Group A** carries very short answer type **compulsory** questions.
ii. **Answer 4 out of 6** subjective/ descriptive questions given in **Group B**.
(खंड 'B' के छः में से किन्हीं चार विषयनिष्ठ / वर्णनात्मक प्रश्नों के उत्तर दें।)
iii. Answer in your own words as far as practicable.
(यथासंभव अपने शब्दों में उत्तर दें।)
iv. Answer all sub parts of a question at one place.
(एक प्रश्न के सभी भागों के उत्तर एक साथ लिखें।)
v. Numbers in right indicate full marks of the question.
(पूर्णांक दायीं ओर लिखे गये हैं।)

Group A

1. [10x1=10]

i. .....
ii. .....
iii. .....
iv. .....
v. .....
vi. .....
vii. .....
viii. .....
ix. .....
x. .....

2. ..... [5]

Group B

3. ..... [15]
4. ..... [15]
5. ..... [15]
6. ..... [15]
7. ..... [15]
8. ..... [15]

Note: There may be subdivisions in each question asked in Theory Examination.

FORMAT OF QUESTION PAPER FOR END SEM EXAMINATION

OF

GE, SEC, GENERAL & AECC HINDI/ ENGLISH COMMUNICATION

Ranchi University, Ranchi

End Sem No. Exam Year

Subject/ Code

F.M. =100 **P.M.**=40 **Time**=3Hrs.

General Instructions:

i. **Group A** carries very short answer type **compulsory** questions.
ii. **Answer 4 out of 6** subjective/ descriptive questions given in **Group B**.
(खंड 'B' के छः में से किन्हीं चार विषयनिष्ठ / वर्णनात्मक प्रश्नों के उत्तर दें।)
iii. Answer in your own words as far as practicable.
(यथासंभव अपने शब्दों में उत्तर दें।)
iv. Answer all sub parts of a question at one place.
(एक प्रश्न के सभी भागों के उत्तर एक साथ लिखें।)
v. Numbers in right indicate full marks of the question.
(पूर्णांक दायीं ओर लिखे गये हैं।)

Group A

1. [10x1=10]

i. .....
ii. .....
iii. .....
iv. .....
v. .....
vi. .....
vii. .....
viii. .....
ix. .....
x. .....

2. ..... [5]

3. ..... [5]

Group B

4. ..... [20]

5. ..... [20]

6. ..... [20]

7. ..... [20]

8. ..... [20]

9. ..... [20]

Note: There may be subdivisions in each question asked in Theory Examination.