परिपत्रक - UG (1) ST

॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, या विद्यापीठा अंतर्गत येणा–या सर्व संलग्नित महाविद्यालयामध्ये शैक्षणिक वर्ष २०२४–२५ पासून पदवीस्तरावर राष्ट्रीय शैक्षणिक धोरण –२०२० लागू करण्याच्या दृष्टीकोनातून विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत येणा–या अभ्यासमंडळांनी तयार केलेल्या पदवी प्रथम वर्षाचे अभ्यासक्रमांना मा. विद्यापरिषदेने दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या बैठकीतील विषय क्रमांक १५/५९–२०२४ च्या ठरावाअन्वये मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील खालील बी. एस्सी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) लागू करण्यात येत आहेत.

1) B. Sc. I year - Botany
2) B. Sc. I year - Seed Technology
3) B. Sc. I year - Horticulture
4) B. Sc. I year - Geology
5) B. Sc. I year - Dairy Science
6) B. Sc. I year -Electronics
7) B. Sc. I year - Environmental Science
8) B. Sc. I year - Fishery Science
9) B. Sc. I year - Mathematics
10) B. Sc. I year - Microbiology
11) B. Sc. I year - Agricultural Microbiology
12) B. Sc. I year - Physics
13) B. Sc. I year - Food Science
14) B. Sc. I year – Computer Science (N M D College Hingoli)

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

डॉ. सरिता लोसरवार
सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२४–२५/९१२
दिनांक १२.०६.२०२४

प्रत : १) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
३) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) मा. संचालक, सर्व संकुले परिसर व उपपरिसर, प्रस्तुत विद्यापीठ
५) मा. प्राचार्य, न्यू मॉडल डिग्री कॉलेज हिंगोली.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदर परिपत्रक संकेतस्थळावर प्रसिध्द करण्यात यावे.

SWAMI RAMANAND TEERTH
MARATHWADA UNIVERSITY,
NANDED - 431 606 (MS)

(Credit Framework and Structure of Four Year UG Program with Multiple Entry and Exit Option as per NEP-2020)

UNDERGRADUATE PROGRAMME OF

SCIENCE & TECHNOLOGY

Major in **GLG** and Minor in **GLG**(Subject)

GLG - GEOLOGY

Under the Faculty of Science & Technology

(Revised as per the Govt. Of Maharashtra circular dt. 13th March 2024)

From the Desk of the Dean, Faculty of Science and Technology & Chairman, BoS in Geology

Swami Ramanand Teerth Marathwada University, Nanded, enduring to its vision statement "***Enlightened Student: A Source of Immense Power***", is trying hard consistently to enrich the quality of science education in its jurisdiction by implementing several quality initiatives. Revision and updating curriculum to meet the standard of the courses at national and international level, implementing innovative methods of teaching-learning, improvisation in the examination and evaluation processes are some of the important measures that enabled the University to achieve ***the 3Es, the equity, the efficiency*** and ***the excellence*** in higher education of this region. To overcome the difficulty of comparing the performances of the graduating students and also to provide mobility to them to join other institutions the University has adopted the cumulative grade point average (CGPA) system in the year 2014-2015. Further, following the suggestions by the UGC and looking at the better employability, entrepreneurship possibilities and to enhance the latent skills of the stakeholders the University has adopted the Choice Based Credit System (CBCS) in the year 2018-2019 at graduate and post-graduate level. This provided flexibility to the students to choose courses of their own interests. To encourage the students to opt the world-class courses offered on the online platforms like, NPTEL, SWAYM, and other MOOCS platforms the University has implemented the credit transfer policy approved by its Academic Council and also has made a provision of reimbursing registration fees of the successful students completing such courses.

SRTM University has been producing a good number of high calibre graduates; however, it is necessary to ensure that our aspiring students are able to pursue the right education. Like the engineering students, the youngsters pursuing science education need to be equipped and trained as per the requirements of the R&D institutes and industries. This would become possible only when the students undergo studies with an updated and evolving curriculum to match global scenario.

Higher education is a dynamic process and in the present era the stakeholders need to be educated and trained in view of the self-employment and self-sustaining skills like start-ups. Revision of the curriculum alone is not the measure for bringing reforms in the higher education, but invite several other initiatives. Establishing industry-institute linkages and initiating internship, on job training for the graduates in reputed industries are some of the important steps that the University would like to take in the coming time. As a result, revision of the curriculum was the need of the hour and such an opportunity was provided by the New Education Policy 2020. National Education Policy 2020 (NEP 2020) aims at equipping students with knowledge, skills, values, leadership qualities and initiates them for lifelong learning. As a result the students will acquire expertise in specialized areas of interest, kindle their intellectual curiosity and scientific temper, and create imaginative individuals.

The curriculum given in this document has been developed following the guidelines of NEP-2020 and is crucial as well as challenging due to the reason that it is a transition from general science based to the discipline-specific-based curriculum. All the recommendations of the ***SukanuSamiti*** given in the **NEP Curriculum Framework-2023** have been followed, keeping the disciplinary approach with rigor and depth, appropriate to the comprehension level of learners. All the Board of Studies (BoS) under the Faculty of Science and Technology of this university have put

in their tremendous efforts in making this curriculum of international standard. They have taken care of maintaining logical sequencing of the subject matter with proper placement of concepts with their linkages for better understanding of the students. We take this opportunity to congratulate the Chairman(s) and all the members of various Boards of Studies for their immense contributions in preparing the revised curriculum for the benefits of the stakeholders in line with the guidelines of the **Government of Maharashtra regarding NEP-2020**. We also acknowledge the suggestions and contributions of the academic and industry experts of various disciplines.

We are sure that the adoption of the revised curriculum will be advantageous for the students to enhance their skills and employability. Introduction of the mandatory ***On Job Training, Internship program*** for science background students is praise worthy and certainly help the students to imbibe firsthand work experience, team work management. These initiatives will also help the students to inculcate the workmanship spirit and explore the possibilities of setting up of their own enterprises.

Prof. Dr. Dipak Baburao Panaskar
Chairman, Board of Studies in Geology,
Swami Ramanand Teerth Marathwada University, Nanded

Dr. M. K. Patil
Dean
Faculty of Science and Technology

Details of the Board of Studies Members in Geology under the faculty of Science & Technology of S.R.T.M. University, Nanded

Sr No	*Name of the Member*	*Designation*	*Address*	*Contact No.*
1	*Dr. Dipak Baburao Panaskar*	*Senior Professor*	*School of Earth Sciences, S. R. T. M. University, Nanded*	*9403227259*
2	*Dr. Hari Shankarrao Patode,*	*Associate Professor*	*School of Earth Sciences, S. R. T. M. University, Nanded*	*9850209045*
3	*Dr.Shaikh MD Babar,*	*Professor*	*DSM 's College of Arts, Commerce and Science College, Parbhani*	*9890184699*
4	*Dr. Bhagwan Balasaheb Ghute,*	*Assistant Professor*	*Toshniwal Arts, Commerce & Science College, Sengaon, Tq. Sengaon, DistHingoli.*	*9130006333*
5	*Dr. Udaykumar Laxmikant Sahu,*	*Assistant Professor*	*Toshniwal Arts, Commerce & Science College, Sengaon, Tq. Sengaon, DistHingoli.*	*9860406757*
6	*Prof. D. C. Meshram*	*Professor*	*Department of Geology, S. P. Pune University, Pune*	*8275697166*
7	*Dr. A. N. Dongre*	*Associate Professor*	*Department of Geology, S. P. Pune University, Pune*	*9922410132*
8	*Dr. Sukanta Roy*	*Principal Scientist (F) & Project Director*	*BGRL, Ministry of Earth Sciences, Karad*	*9490469980*
9	*Prof. A. R. Kulkarni*	*Professor*	*SIBER, Kolhapur*	*7588470146*

B. Sc. First Year Semester I *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	SGLGCT1101	Mineralogy and Crystallography	02	--	04	02	--
	SGLGCP1101	Prac ticals based on SGLGCC1101	-	02			04
Optional 2	SDSCMT1101	Title of paper 1	02	--	04	02	--
	SDSCMP1101	Title of paper 2 (practical)	-	02			04
Optional 3	SDSCMT1101	Title of paper 1	02	--	04	02	--
	SDSCMP1101	Title of paper 2 (practical)	-	02			04
Generic Electives (from other Faculty)	SGLGGE1101	Introduction to Minerals (Basket 3 of respective Faculty)	02	--	02	02	--
Skill Based Course (related to Major)	SDSCSC1101	Roof Water harvesting Or Preparation of Topographical Maps	--	02	02	--	04
Ability Enhancement Course	AECENG1101	L1 – Compulsory English	02	--	02	02	--
Ability Enhancement Course	AECMIL1101	L2- Marathi/Hindi/Urdu/ Kannada/Pali	02	--	02	02	--
Indian Knowledge System (IKS)	IKSXXX1101	Select from **Basket 5**	02	--	02	02	--
Community Engagement Services (CES)	CCCXXX1101	-	-	--	--	--	--
Total Credits			14	08	22	14	16

B. Sc. First Year Semester I *(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	Course Name (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Optional 1	SGLGCT1101	Mineralogy and Crystallography	10	10	10	40	--	--	50
	SGLGCP1101	Practicals based on SGLGCC1101	--	--	--	--	20	30	50
Optional 2	SDSCMT1101	Title of paper 1	10	10	10	40	--	--	50
	SDSCMP1101	Title of paper 2 practical	--	--	--	--	20	30	50
Optional 3	SDSCMT1101	Title of paper 1	10	10	10	40	--	--	50
	SDSCMP1101	Title of paper 2 practical	--	--	--	--	20	30	50
Generic Elective	SGLGGE1101	Introduction to Minerals **(Basket 3)**	10	10	10	40	--	--	50
Skill Based Course	SGLGSC1101	Roof Water harvesting Or Preparation of Topographical Maps	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1101	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	AECMIL1101	L2- Marathi/Hindi/Urdu / Kannada/Pali	10	10	10	40	--	--	50
Indian Knowledge System	IKSXXX1101	Select from **(Basket 5)**	10	10	10	40	--	--	50
Community Engagement Services (CC)	CCCXXX1101	--	--	--	--	--	--	--	--

B. Sc. First Year Semester II *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	SGLGCT1151	Petrology	02	--	04	02	--
	SGLGCP1151	Practicals based on SGLGCT1151	-	02			04
Optional 2	SDSCMT1151	Title of paper 1	02	--	04	02	--
	SDSCMP1151	Title of paper 2 (practical)	-	02			04
Optional 3	SDSCMT1151	Title of paper 1	02	--	04	02	--
	SDSCMP1151	Title of paper 2 (practical)	-	02			04
Generic Electives (from other Faculty)	SGLGGE1151	Introduction to Rocks (Basket 3 of respective Faculty)	02	--	02	02	--
Skill Based Course (related to Major)	SGLGSC1151	Preparation of Lithologs OR Properties of Soil	--	02	02	--	04
Ability Enhancement Course	AECENG1151	L1 – Compulsory English	02	--	02	02	--
Ability Enhancement Course	AECMIL1151	L2- Marathi/Hindi/Urdu/ Kannada/Pali	02	--	02	02	--
Value Education Courses (VEC)	VECCOI1151	Constitution of India	02	--	02	02	--
Community Engagement Services (CES)	CCCXXX1151	--	-	--	--	--	--
Total Credits			14	08	22	14	16

B. Sc. First Year Semester II*(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	Course Name (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Optional 1	SGLGCT1151	Petrology	10	10	10	40	--	--	50
	SGLGCP1151	Practicals based on SGLGCT1151	--	--	--	--	20	30	50
Optional 2	SDSCMT1151	Title of paper 1	10	10	10	40	--	--	50
	SDSCMP1151	Title of paper 2 practical	--	--	--	--	20	30	50
Optional 3	SDSCMT1151	Title of paper 1	10	10	10	40	--	--	50
	SDSCMP1151	Title of paper 2 practical	--	--	--	--	20	30	50
Generic Elective	SGLGGE1151	Introduction to Rocks (Basket 3 of respective Faculty)	10	10	10	40	--	--	50
Skill Based Course	SGLGSC1151	Preparation of Lithologs OR Properties of Soil	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1151	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	AECMIL1151	L2- Marathi/Hindi/Urdu/ Kannada/Pali	10	10	10	40	--	--	50
Value Education Courses (VEC)	VECCOI1151	Constitution of India	10	10	10	40	--	--	50
Community Engagement Services (CC)	CCCXXX1151	--	--	--	--	--	--	--	--

Baskets Prepared:

List of courses under Generic Elective course (GE):
Name of the Faculty:

Board of studies in the subject of	Semester	List of courses from respective Board of Studies (BoS) for students of other faculty/ program/schools (semester wise)	Credit : 3 Choose any one from the basket of courses (Common across faculty)	Assessment: 20% - Continuous Assessment 80% - End Semester Examination
Geology	1	Introduction to Minerals	Introduction to Minerals	20% CA 80% ESE
Geology	2	Introduction to Rocks	Introduction to Rocks	20% CA 80% ESE

List of courses under Ability Enhancement Course :
Name of the Faculty:
L1- Compulsory English: 2 credits
L-2 Choose from basket of courses: 2 credits

Boas of studies in the subject of	Semester	List of Courses (L2) to be offered from respective board to the students. Choose any one from the basket of courses (Common across faculty)	Credit :	Assessment: 20 % - Continuous Assessment 80% - End Semester Examination
Languages	1	L1- Compulsory English	2	20% CA 80% ESE
Languages	2	L1- Compulsory English	2	20% CA 80% ESE

List of courses under Vocational and Skill course related DSC (VSC) : Choose courses from basket

Boas of studies in the subject of	Semester	List of Courses to be offered from respective board to the students (Choose any one from the basket)	Credit	Assessment: 20 % -Continuous Assessment 80% - End Semester Examination
Geology	1	Roof Water harvesting OR Preparation of Topographical Maps	2	20% CA 80% ESE
Geology	2	Preparation of Lithologs OR Properties of Soil	2	20% CA 80% ESE

SGLGCT1101: *Title (Major 1) Curriculum Details*

SGLGCT1101: Mineralogy and Crystallography ***(Major 1) Curriculum Details***

Semester I

Coursepre-requisite:

1. The course is essential to have understanding of the basic chemistry and physical characters of materials and to have basic information of earth crust.

Courseobjectives:

- To acquaint the students with Mineralogical applications in Geology.
- To understand, the formation and physico-chemical characters of earth's composition.

Courseoutcomes:

- Student will be able to know the fundamentals and identification of minerals.
- Student will use this information for the study of rocks.

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGCT1101: Mineralogy and Crystallography

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		Mineralogy	08
	1.1	Chemical bonding and compound formation.	
	1.2	Mineral: definition, classification and composition.	
	1.3	Introduction to common groups of rock forming minerals such as Olivine and Pyroxene.	
	1.4	Introduction to common groups of rock forming minerals such as Amphibole and Mica.	
2.0		Mineralogy	07
	2.1	Introduction to common groups of rock forming minerals such as Silica and Feldspar.	
	2.2	Study of Common ore minerals.	
	2.3	Study of Common industrial minerals.	
	2.4	Study of Common atomic minerals.	
3.0		Crystallography	07
	3.1	Elementary ideas about crystal structure. Crystal: faces, edges, solid angles.	
	3.2	Crystallographic axes and axial angles.	
	3.3	Interfacial angles, Contact Goniometer; Parameters and indices.	
	3.4	Crystal symmetry characters.	
4.0		Crystallography	08
	4.1	Classification of crystals into six systems for normal classes such as Cubic and Tetragonal.	
	4.2	Classification of crystals into six systems for normal classes such as Hexagonal and Orthorhombic systems.	
	4.3	Classification of crystals into six systems for normal classes such as Monoclinic and Triclinic systems.	
	4.4	Crystal forms; Twin and Twin laws.	
		Total	30

Text Books & Reference Books:

1. Berry, L.G., Mason, B. and Dietrich, R.V., 1982. Mineralogy. CBS Publ.

2. Nesse, D.W., 1986. Optical Mineralogy. McGraw Hill.

3. Read, H.H., 1968. Rutley's Element of Mineralogy (Rev. Ed.). Thomas Murby and Co

4. Flint, Y., 1975. Essential of crystallography, Mir Publishers.

5. Phillips, F.C., 1963. An introduction to crystallography.Wiley, New York.

6. Stephen E. Keslerand Adam C. Simon (2015).Mineral Resources Economics and the Environment. Cambridge University Press.

7. Mehar D.N. Wadiya (2021).Minerals Of India. National Book Trust of India

SGLGCP1101: Practicals based on SGLG CT1101

1. Study of physical properties of minerals in hand specimen.

2. Study of axial characters, elements of symmetry and forms for normal classes of six crystal system.

Generic Elective

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGGE1101: Introduction to Minerals

Semester I

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Mineral**	07
	1.1	Definition.	
	1.2	Classification.	
	1.3	Composition.	
	1.4	Atomic bonds of minerals.	
2.0		**Physical properties of mineral**	08
	2.1	Introduction to general Physical properties of minerals .	
3.0		**Groups of Rock Forming Minerals**	07
	3.1	Introduction to common groups of rock forming minerals	
	3.2	Study of Olivine and Pyroxene Group.	
	3.3	Study of Amphibole and Mica Group.	
	3.4	Study of Silica and Feldspar Group.	
4.0		**Study of Common minerals**	08
	4.1	Study of Common ore minerals, industrial minerals and atomic minerals.	
	4.2	Study of Common industrial minerals	
	4.3	Study of Common Atomic minerals.	
		Total	30

Text Books & Reference Books:

1. Berry, L.G., Mason, B. and Dietrich, R.V., 1982. Mineralogy. CBS Publ.
2. Nesse, D.W., 1986. Optical Mineralogy. McGraw Hill.
3. Read, H.H., 1968. Rutley's Element of Mineralogy (Rev. Ed.). Thomas Murby& Co.
4. Stephen E. Keslerand Adam C. Simon (2015).Mineral Resources Economics and the Environment. Cambridge University Press.
5. Mehar D.N. Wadiya (2021).Minerals Of India. National Book Trust of India

Vocational and Skill Enhancement Courses (SEC)

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGSC1101: Roof water Harvesting

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		Introduction to rainwater harvesting	07
	1.1	Hydrological cycle	
	1.2	Scarcity of water	
	1.3	Flood and drought	
	1.4	Factors affecting rainwater harvesting	
2.0		Methods of rainwater harvesting	08
	2.1	Direct use	
	2.2	Artificial techniques	
	2.3	Guidelines for Construction of Rainwater Harvesting Structures	
3.0		Calculation of Rainwater	07
	3.1	Calculation of surface area	
	3.2	Calculation of rainfall	
	3.3	Use of equations	
	3.4	Examples of Harvestable Rainwater	
4.0		Advantages of Rainwater Harvesting System	08
	4.1	The water conservation benefits of rainwater harvesting	
	4.2	The environmental benefits of rainwater harvesting	
	4.3	The Future of sustainable water resources	
	4.4	Create awareness	
		Total	30

Text Books & Reference Books:

1. Klaus Koenig (2001). The Rainwater Technology Handbook: Rain harvesting in Building. Wilobrain, Germany
2. Anil Agarwal, Sunita Narain and Indira Khurana (2001). Making water everybody's business: practice and policy of water harvesting. Centre for Science and Environment, New Delhi.
3. John Gould and Erik Nissen - Petersen. (2000). Rainwater Catchment Systems for Domestic Supply: Design, Construction and Implementation. Intermediate Technology Publications.
4. E M Tideman (2000). Watershed management, guidelines for Indian Conditions. Omega Scientific Publications, New Delhi.
5. Kollegal K. Meghashyam, Yogendra Popli, Akalank Kumar Jain (2014). J. Rain Water Harvesting A New Concept to Utilize Rainwater and Secure Future. .M. Jaina & Brothers.
6. Anthony Zagelow (2016). Rainwater Harvesting and Use: Understanding the Basics of Rainwater Harvesting: 1 (Water Conservation, Resource Management, Crisis, Water Storage, Water Security). Create space Independent Pub.

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGSC1101: Preparation of Topographical Maps

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Basics of Topographical Maps**	07
	1.1	Concepts of map reading, map index.	
	1.2	Types scale, coordinate system (Latitude/Longitude).	
	1.3	Distance and legend.	
	1.4	Height and place approximation.	
2.0		**Topographical Map Reading**	08
	2.1	Topographic sheet (SoI) in field, marking location.	
	2.2	Contours represent height .	
	2.3	Geography of area in maps (high ground, hills, valleys, plateaus, saddles etc).	
3.0		**Topographical Contours**	07
	3.1	Contours indicate slopes.	
	3.2	Types of slope .	
	3.3	Relief.	
4.0		**Technique for Preparation of Topographical Maps**	08
	4.1	Interpretation of natural and man-made features from topographic map (Survey of India).	
	4.2	Technique and procedure for Preparation of topographical maps from the given contour data..	
	4.3	At least 5 maps to be prepared.	
		Total	30

Text Books & Reference Books:

1. V.G. Amrite . (2021). New Topo Map Book. Akshar Publication.
2. Nelson Petrie (2016). Analysis and Interpretation of Topographical Maps. The Orient Blackswan.
3. Greg Miller, Betsy Mason (2018). All over the Map: A Cartographic Odyssey. National Geographic.
4. Vinod Sharma (2019) Map Study – Topographical. Prachi Publication.
5. Raghu Vira and B.G. Tamaskar (2020) Conventional signs for topographical maps of the survey of India. Nagpur : International Academy of Indian Culture.

SGLGC1151: Petrology *(Major 1) Curriculum Details*

Semester II

Coursepre-requisite:

3. The course is essential to have the understanding of the formation for Igneous, Sedimentary and Metamorphic rocks.

Courseobjectives:

- To acquaint the students with formation process of Igneous, Sedimentary and Metamorphic rocks.
- To Study of common igneous, Sedimentary and Metamorphic rocks.

Courseoutcomes:

- Student will be able to know the formation process of Igneous, Sedimentary and Metamorphic rocks.
- Student will be able to identify the common igneous, Sedimentary and Metamorphic rocks.

Curriculum Details:*(There shall be FOUR Modules in each course)*

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Igneous Petrology**	07
	1.1	Definition, composition & origin of magma.	
	1.2	Origin, Forms, Textures, structures.	
	1.3	Classification of igneous rocks .	
	1.4	Study of common igneous rocks.	
2.0		**Metamorphic Petrology**	08
	2.1	Agents and kinds of metamorphism.	
	2.2	Metamorphic minerals, structures of metamorphic rocks.	
	2.3	Processes of formation of various metamorphic rocks by the process of Cataclastic, Thermal, Dynamothermal and Plutonic metamorphism.	
	2.4	Study of common metamorphic rocks.	
3.0		**Sedimentary Petrology**	07
	3.1	Weathering.	
	3.2	Soil formation.	
	3.3	Soil profile and soil types.	
	3.4	Soil properties.	
4.0		**Sedimentary Petrology**	08
	4.1	Origin, transportation, deposition, consolidation and digenesis of sediments.	
	4.2	Sedimentary textures.	
	4.3	Classification of sedimentary deposits.	
	4.4	Study of common sedimentary rocks.	
		Total	30

Text Books&ReferenceBooks:

1. Principles of Petrology. Methuren and Co (Students ed.).
2. Ehlers, WG, and Blatt, H., 1987. Petrology, Igneous, Sedimentary and Metamorphic rocks, CBS Publishers.
3. Turner, F.J. &Verhoogen, J., 1960, Igneous & Metamorphic petrology. McGraw Hill Co.
4. Moorhouse, WW., 1969. The study of rocks in thin sections. Harper and sons.
5. Friedman & Sanders, 1978. Principles of Sedimentology. John Wiley and sons.
6. Pettijohn, F.J., 1975. Sedimentary rocks, Harper & Bros. 3rd Ed.
7. Prasad, C., 1980. A text book of sedimentology. 8. Sengupta. S., 1997. Introduction to sedimentology. Oxford-IBH.
8. Mason, R., 1978. Petrology of Metamorphic Rocks. CBS Publ.

SGLGCP1151: Practicals based on SGLGCT1151

1. Study of megascopic characters of important rock types of igneous, sedimentary and metamorphic origin.
2. Geological Field Work (Three Days). Students will be required to carry out fieldwork for three days to study elementary aspects of field geology and submit report thereon.

Generic Elective

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGGE1151: Introduction to Rocks

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Rocks**	07
	1.1	Definitions and physical process of rock formation,	
	1.2	Types of rocks.	
	1.3	Rock Cycle.	
2.0		**Igneous Rocks**	08
	2.1	Definition, composition and origin of magma.	
	2.2	Forms, Textures and structures.	
	2.3	Classification of igneous rocks.	
	2.4	Study of common igneous rocks.	
3.0		**Sedimentary rocks**	07
	3.1	Origin of sediments Weathering, Physical and chemical weathering.	
	3.2	Identifications of textures and structures.	
	3.3	Classification of sedimentary deposits.	
	3.4	Study of common sedimentary rocks.	
4.0		**Metamorphic rocks**	08
	4.1	Agents and kinds of metamorphism, metamorphic minerals.	
	4.2	Structures of metamorphic rocks.	
	4.3	Processes of formation of various metamorphic rocks by the process of Cataclastic, Thermal, Dynamothermal and Plutonic metamorphism.	
	4.4	Study of common metamorphic rocks.	
		Total	**30**

Text Books & Reference Books:

1. Terryl G.W. 1989. The Principles of Petrology by AITBS Publishers.
2. Ehlers, WG, and Blatt, H., 1987. Petrology, Igneous, Sedimentary and Metamorphic rocks, CBS Publishers.
3. Turner, F.J. &Verhoogen, J., 1960, Igneous & Metamorphic petrology. McGraw Hill Co.
4. Moorhouse, WW., 1969. The study of rocks in thin sections. Harper and sons.
5. Friedman & Sanders, 1978. Principles of Sedimentology. John Wiley and sons.
6. Pettijohn, F.J., 1975. Sedimentary rocks, Harper & Bros. 3rd Ed.
7. Prasad, C., 1980. A text book of sedimentology.
8. Sengupta. S., 1997. Introduction to sedimentology. Oxford-IBH.
9. Mason, R., 1978. Petrology of Metamorphic Rocks. CBS Publ.

Vocational and Skill Enhancement Courses (SEC)

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGSC1151: Preparation of Lithologs

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to lithologs**	07
	1.1	Introduction to rocks.	
	1.2	Definition.	
	1.3	Measurement and interpretation of lithologs.	
2.0		**Sedimentary lithologs**	08
	2.1	Field and laboratory techniques in sedimentology.	
	2.2	Recording of sedimentary structures.	
3.0		**Igneous/metamorphiclithologs**	07
	3.1	Preparation of lithologs from field data.	
	3.2	Laboratory study of oriented samples etc.	
4.0		**Preparation of lithologs**	08
	4.1	Preparation of litholog from visible vertical section.	
	4.2	Detection of ideal cycle from vertical litholog.	
	4.3	Analysis of palaeo-current data Interpretation.	
	4.4	Correlation of lithology from lithologs.	
		Total	30

Text Books & Reference Books:

1. Terryl G.W. (1989). The Principles of Petrology by AITBS Publishers**.**
2. Ehlers, WG, and Blatt, H., (1987). Petrology, Igneous, Sedimentary and Metamorphic rocks, CBS Publishers.
3. Turner, F.J. &Verhoogen, J., 1960, Igneous & Metamorphic petrology. McGraw Hill Co.
4. Pettijohn, F.J., 1975. Sedimentary rocks, Harper & Bros. 3rd Ed.
5. Mason, R., 1978. Petrology of Metamorphic Rocks. CBS Publ.

Curriculum Details:*(There shall be FOUR Modules in each course)*

SGLGSC1151: Properties of Soil

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to soil**	07
	1.1	Formation of soil	
	1.2	Soil horizon structure	
	1.3	Climate and source rock relation	
	1.4	Importance of soil	
2.0		**Soil properties**	08
	2.1	Soil color	
	2.2	Composition of soil	
	2.3	Soil texture and porosity	
	2.4	Factors affecting soil fertility; nutrient sources	
3.0		**Types of soils**	07
	3.1	Alluvial Soil	
	3.2	Black Cotton Soil	
	3.3	Red Soil	
	3.4	Mountainous or Forest Soils, Desert Soil, Saline and Alkaline Soil	
4.0		**Soil conservation methods**	08
	4.1	Terrace farming	
	4.2	contour farming	
	4.3	crop rotation	
	4.4	Intercropping etc.	
		Total	30

Text Books & Reference Books:

1. TNAU (ICAR, 2021). Introduction to Soil Science. ICAR
2. D. Tripathi, S. Mani, Sh. Mohinder Singh (2020). Fundamentals of Soil Science. ICAR
3. R. K. Mehra (2004). Textbook of Soil Science. ICAR
4. Henry D. Foth (1951). Fundamentals of Soil Science. John Wiley & Sons
5. Donald L. Sparks (2019). Fundamentals of Soil Chemistry, Wiley and Sons

Guidelines for the Course Assessment:

A. Continuous Assessment (CA) (20% of the Maximum Marks) of theory and practical courses:

i. **For Theory Course:** CA shall form 20% of the Maximum Marks and shall be carried out over the entire semester. It shall be done by conducting **Two Tests** (Test I on 40% curriculum) and **Test II** (on remaining 40% syllabus) and average of the marks scored by a student in these two tests of a particular paper shall be taken as the **CA** score.

ii. **For Practical Course:** CA score of the practical course shall be marks scored by a student in the internal practical examination conducted by the concerned teacher.

B. End Semester Assessment (80% of the Maximum Marks) of theory and practical courses:

(For illustration a paper of 02 credits, 50 marks has been considered and shall be modified appropriately depending upon credits of the individual paper)

Question Paper Pattern of the ESA:

i. **ESA Question paper shall consist 6 questions, each of 10 marks**
ii. **Question No.1 shall be compulsory and shall be based on the entire syllabus**
iii. Students shall have to solve ***ANY THREE*** of the remaining Five Questions (i.e. from question 2 to 6)
iv. **Students shall have to solve a TOTAL of 4 Questions.**

C. Assessment of On Job Training (OJT) Course (for 04 credits):

a. Continuous assessment part (**40%, 40 marks out of 100**) of this course shall be done by the mentor of the student, where he /she is supposed to complete his On Job Training. This shall be based on the regularity, participation and performance of the students at the place of OJT.

b. Semester End Assessment (ESA) (**60% of the total marks, 60 marks out of 100**) of this course shall be done by a panel of examiners in two parts

i. based on the work report submitted by the student (**50% i.e. 30 marks)** and

ii. **Remaining 50%** (30 marks) shall be based on his presentation and viva-voce on the work carried to be assessed by the panel of examiners. This assessment shall be done along with practical examinations of respective courses / subjects.

D. Assessment of Field Project (FP) and Research Project (RP) (e.g. for 02 credits)

a. Continuous assessment part (**40%, 20 marks out of 50**) of this course shall be done by the mentor of the student and shall be based on regularity, experimental work and performance of the student.

b. Semester End Assessment (ESA) (**60% of the total marks, 30 marks out of 50**) of this course shall be done shall be done by a panel of examiners in two parts

i. based on the work report submitted by the student (**50% i.e. 30 marks)** and

ii. **Remaining 50%** (30 marks) shall be based on his presentation and viva-voce on the work carried out by the student. This assessment shall be done along with practical examinations of the respective courses / subjects.

E. Assessment of Co-Curricular courses (CCC):

a. Assessment of the CCC course shall be done by the respective course coordinator as a part of CA and be based on the regularity, performance of a student and his participation in various activities as prescribed in the regulations prepared in this regard.

b. The End Semester Assessment (ESA) of the CCC courses shall be done as per the regulations prepared in this regard and shall be done on the basis of the write-up, presentation by the student on the activities that he has carried out in a semester.

c. Students shall have freedom to opt for more than one CCC courses. However, score of the best performing CC shall be considered for preparing his result.

F. Syllabi, Teaching and Examination Scheme for the courses in Column 7 and Column 8 (AEC, VEC, IKS, CI, EVS, CCCs, etc.) shall be common for all the students from different faculties.

Note: Number of lectures required to cover syllabus of a course depends on the number of credits assigned to a particular course. One credit of theory corresponds to 15 Hours lecturing and for practical course one credit corresponds to 30 Hours. For example, for a course of two credits 30 lectures of one hour duration are assigned, while that for a three credit course45 lectures.

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