Central University of Kerala

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Tejaswini Hills, Periye (P.O.), Kasaragod, Kerala, India, 671316
DEPARTMENT OF GEOLOGY

No. CUK/GEO/BOS/MIN/2019/01 Dtd: 28/06/2019

Minutes of the Meeting of Board of Studies in Geology held at Conference Hall, Central University of Kerala, Periye at 10.00 a.m. on 28/06/2019

The Department of Geology, Central University of Kerala conducted the Board of Studies (BoS) meeting on 28th June, 2019 at the Room No. 317, Sabarmati Building. The meeting started at 10.30 am and ended at 2.30 pm. The panel members included invited subject experts, Head of the Department and internal members. The attendees of the meeting were as follows: -

BoS Attendees:
Invited subject experts

- Dr. R. Shankar, Professor (retired), Dept. of Marine Geology, Mangalore University, Mangalagangothri-574199
- Dr. V. Prasannakumar, Professor (Rtd) and Emeritus Fellow, University of Kerala
- Dr. Ganesha Raj, General Manager, Regional Remote Sensing Centre- South, NRSC, ISRO, Bengaluru-560037

Internal members from the Central University of Kerala

- Dr. Sandeep K, Assistant Professor and HOD (i/c), Dept. of Geology.
- Dr.Pratheesh P, Assistant Professor, Dept. of Geology.
- Dr.Jeyabalan Sangeetha, Assistant Professor, Dept. of Environmental Science.

* Absentees: Shri. Suresh Chandran, Dy. Director General (Rtd), Geological Survey of India, Thiruvananthapuram.

The BoS meeting started with the welcome address by Dr.Sandeep K, Head of the Department (i/c). The agenda for discussion in the BoS meeting was proposed by the Head of the Department. The main items discussed in the BoS are given below:

1. The revision of the structure and content of the syllabus in connection with the Academic Council decision to adopt equal credits for core and elective courses offered by various departments and follow uniform syntax for course codes.
2. Consider and decide on the proposals from the Faculty Council concerned with the curriculum.
3. Consider and decide on the proposal from the Director, Geological Survey of India, Mangalore to include Gt Aide (Academy) in the syllabus.

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4. Eligibility criteria for the M.Sc. Geology Programme.

5. Any other matter permitted by the Chair.

The details of agenda-wise discussion and the final recommendation by the BoS are given below.

Agenda 1: The revision of the structure and content of the syllabus in connection with the Academic Council decision to adopt equal credits for core and elective courses offered by various departments and follow uniform syntax for course codes.

There was elaborate discussion on this item and the structure and content of the syllabus. Dr. Sandeep K presented the proposed structure and courses for the four semesters. He also explained the rationale for combining two courses together in the proposed syllabus in order to adopt equal and uniform credits as suggested by the Academic Council of the university. Dr. Prasannakumar suggested to remove the 'Geoinformatics' component from the course EGE 5191 Lab 1: Structural Geology, Geological Field Mapping and Geoiformatics as it will be difficult to conduct the practical examination of the 'geoinformatics' together with Structural Geology and Geological Field Mapping. He suggested to include those contents in the elective course EGE 5003: Geomatics. Dr. Ganesha Raj suggested to rename the elective course EGE 5003: Geomatics to 'Geospatial Technology'. Dr. Prasannakumar suggested to remove the contents of Physical Geology from the elective course EGE 5002: Physical and Engineering Geology. Dr. Shankar suggested that 'Physical Geology' can be a separate elective course. Dr. R Shankar and Dr. Ganesha Raj suggested to revise the title of the course 'EGE 5005: Environmental Geology and Natural Hazards' to 'EGE 5005: Environmental Geology and Disaster Management' as the course contains contents on human-induced hazards and a unit on Disaster Management.

Recommendations: Following detailed discussion on the structure and contents of the syllabus recommended by the faculty council, BoS members consensually proposed following changes in the course structure.

- All the courses were rearranged so that there are 4 credits for core courses (theory), 3 credits for core courses (practical/lab) and elective courses.
- The core course 'EGE 5191: Lab 1: Structural Geology, Geological Field Mapping and Geoinformatics' is renamed as 'Structural Geology and Geological Field Mapping'. It is

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decided to include the 'Geographic Information Systems' component of the course to the elective paper 'EGE 5003: Geomatics'.

- The elective course EGE 5003: Geomatics is renamed as 'Geospatial Technology' with the addition of practical components transferred from the core course 'EGE 5191: Lab 1: Structural Geology, Geological Field Mapping and Geoinformatics'.
- The elective course 'EGE 5002 Physical and Engineering Geology' is renamed as 'EGE 5002: Engineering Geology'. The physical geology component is included in the separate elective 'EGE 5015: Physical Geology' which is added to the elective courses.
- The elective course 'EGE 5005: Environmental Geology and Natural Hazards' is renamed as 'EGE 5005: Environmental Geology and Disaster Management'.
- The final course distribution and syllabus structure is shown below:

I SEMESTER		Credits	Lecture hrs.	Lab hrs.	Field hrs.
EGE 5101	Geomorphology and Sedimentology	4	4		
EGE 5102	Structural Geology	4	4		
EGE 5103	Palaeontology and Stratigraphy	4	4		
EGE 5191	Lab 1: Structural Geology and Geological Field Mapping	3		4	2
EGE 5192	Lab 2: Sedimentology and Palaeontology	3	3		
	Elective	3	3		
II SEMESTER					
EGE 5201	Igneous and Metamorphic Petrology	4	4		
EGE 5202	Mineralogy and Geochemistry	4	4		
EGE 5291	Lab 3: Igneous and Metamorphic Petrology	3		6	
EGE 5292	Lab 4: Mineralogy and Crystallography	3		6	
	Elective	3	3		
	Elective	3	3		
III SEMESTER					
EGE 5301	Economic Geology	4	4		
EGE 5302	Hydrogeology	4	4		
EGE 5391	Lab 5: Ore Geology	3		6	
EGE 5392	Lab 6: Hydrogeology	3		6	
	Elective	3	3		
	Elective	3	3		
IV SEMESTER					
EGE 5490	Dissertation	8		4	12
EGE 5491	Field Geology	3			6

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ELECTIVES		Credits
EGE 5001	Industrial Minerals and Gemstones	3
EGE 5002	Engineering Geology	3
EGE 5003	Geospatial Technology	3
EGE 5004	Coal and Petroleum Geology	3
EGE 5005	Environmental Geology and Natural Hazards	3
EGE 5006	Water Resource Management	3
EGE 5007	Isotope Geology	3
EGE 5008	Quaternary Geology	3
EGE 5009	Structural Analysis	3
EGE 5010	Planetary Geoscience	3
EGE 5011	Oceanography	3
EGE 5012	Climatology	3
EGE 5013	Mineral Wealth of India	3
EGE 5014	Geostatistics	3
EGE 5015	Physical Geology	3

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2. Consider and decide on the proposals from the Faculty Council concerned with the curriculum.

Dr. Sandeep presented the proposed contents of the each core and elective course by the Faculty Council. There was an elaborate discussion on this item. Dr. R Shankar suggested to add Author/s, Year, Title, Publisher's name and place, Total no. of pages in references list wherever it is missing. Dr. R Shankar, Dr. V Prasannakumar, Dr. Ganesha Raj and Dr. Jayabalan Sangeetha suggested a few corrections and modifications in the contents of the courses proposed by the Faculty Council.

Recommendations: Following detailed discussion on the contents of the courses recommended by the faculty council, BoS members approved the overall syllabus with the following minor changes:

- 'The association of primary sedimentary structures and textural characteristics with depositional environments or settings' is included in the core course 'EGE 5101: Geomorphology and Sedimentology'.
- 'Analysis of fractures and faults, Coulomb failure criteria, Buckling- Biot-Ramberg theory of buckling' is included in the core course 'EGE 5102: Structural Geology'.

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- 'Binary, Ternary and Quaternary systems' are added in the core course EGE 5201: Igneous and Metamorphic Petrology.
- The units of the core course 'EGE 5292: Lab 4: Mineralogy and Crystallography' are re-arranged with Mineralogy units coming first. The content 'Stereographic projections of the symmetries of Normal classes of Isometric, Tetragonal and Hexagonal systems. Gnomonic projection of normal class Isometric system' in the unit-3 are deleted.
- The collection of well-inventory data and ground water quality has been added in the core course EGE 5392: Hydrogeology.
- The third unit is added in the core course 'EGE 5491: Field Geology'.
- The components of the core course 'EGE 5490: Dissertation' are re-arranged.
- The units of the elective course 'EGE 5002: Engineering Geology' are re-arranged.
- The 'Geographic Information Systems' component core course 'EGE 5191: Lab 1: Structural Geology and Geological Field Mapping' is included in the elective course 'EGE 5003: Geospatial Technology'.
- The units of the elective course 'EGE 5004: Coal and Petroleum Geology' are re-arranged with allotment of one unit for the 'coal' and two units for 'petroleum'.
- In the elective course 'EGE 5005: Environmental Geology and Disaster Management', the contents of the unit-2 'Water Resources-Hydrological Considerations, Problems and Management – Nature of ground water, Infiltration of rain water, water table, Movement of ground water' are deleted.
- 'Water quality standards' are added in the elective course 'EGE 5006: Water Resource Management'.
- In the elective course 'EGE 5007. Isotope Geology', the 'Oxygen and Hydrogen Isotope Fractionation during precipitation and evaporation' and 'Boron isotopes' have been added.
- The archives and proxies in the elective course 'EGE 5008: Quaternary Geology' have been re-arranged.
- 'Lunar and Mars Missions, Chandrayan and Mangalyan, Exploring the planets and asteroids for minerals' are added in the elective course 'EGE 5010. Planetary Geoscience'.
- The unit-1 is re-drafted in the elective course EGE 5011: Oceanography.
- The unit-1 is re-drafted in the elective course EGE 5013: Mineral Wealth of India.

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- Author/s, year, title, publisher's name and place, total no. of pages were added in references list wherever it was missing.

Agenda 3: Consider and decide on the proposal from the Director, Geological Survey of India, Mangalore to include Gt Aide (Academy) in the syllabus (Annexure 1).

The members discussed the proposal from the Director, Geological Survey of India, Mangalore to include Gt Aide, which is a freeware with applications in various courses of Geology. However, Dr. Prasannakumar suggested that it is not right to include the contents proposed in the syllabus as there are many such freewares available for various purposes in geology. However, he suggested that it can be used in the class and its applications can be taught to students without mentioning a specific software in syllabus.

Recommendations: Following detailed discussion on the subject, it is decided not to include any specific software in the syllabus.

Agenda 4: Minimum eligibility criteria for the admission to M.Sc. Geology Programme.

The revised eligibility criterion of the M.Sc. Geology Programme has been already approved by the members through e-mail communication. The members discussed and ratified the same.

Recommendations: The members approved and ratified the revised eligibility criteria as follows:

B.Sc. Geology / B.Sc.Geology and Water Management/B.Sc. (Hons.) Geology with minimum 55% marks or equivalent grade in aggregate and in the concerned subject separately, from a recognized University (studied in 10+2+3 system). B.Sc. Tripple main programme with Geology as one of the main/major/core subject is also eligible. However Geology should have equal or more weightage with respect to the other two main subjects. The student must have studied Geology in all the three years of B.Sc. Programme. The B.Sc. tripple main programme with Geology as a subsidiary/ minor subject or having less weightage compared to other two main subjects is not eligible.

After this, overall agenda discussed in the BoS were summarised by Dr. Sandeep. The BoS approved the revised M.Sc. Geology syllabus recommended by the Faculty Council with minor modifications and revisions. Thereafter, Dr. Sandeep offered vote of thanks, which concluded the BoS meeting.

Dr. Sandeep K
Head (I/c), Dept. of Geology
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Members present at the 2nd Meeting of the Board of Studies, Dept. of Geology held on 28th June, 2019 in the Department of Geology, Central University of Kerala

Sl. No.	Members present	Signature
1.	Dr. Sandeep K Assistant Professor and HOD (i/c) Dept. of Geology, Central University of Kerala	28/6/19
2.	Dr. Pratheesh P Assistant Professor Dept. of Geology, Central University of Kerala	28/06/19
3.	Dr. Jeyabalan Sangeetha Assistant Professor Dept. of Environmental Science, Central University of Kerala	28/06/19
4.	Dr. R. Shankar Professor (retired), Dept. of Marine Geology, Mangalore University, Mangalagangothri-574199	28/06/19
5.	Dr. V. Prasannakumar Professor (Rtd) and Emeritus Fellow, University of Kerala	28 06 19
6.	Dr. Ganesha Raj General Manager, Regional Remote Sensing Centre- South, NRSC, ISRO Bengaluru-560037	28/6/19
7.	Shri. Suresh Chandran Dy. Director General (Rtd) Geological Survey of India	absent

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EGE 5101. Geomorphology and Sedimentology (4 credits)

Unit – 1

Fundamental concepts in geomorphology. Different models for the Evolution of landscape: Davis, Penck, King, Hack. Hill slopes: slope elements, classification, models of slope evolution, slope movement and stability factors. Landforms in relation to climate, rock type, structure and tectonics. Fluvial Geomorphology: Erosional and depositional landforms of rivers. Drainage systems and patterns. Morphometric elements and parameters - morphometric analysis of drainage basins. Coastal geomorphology: Coastal erosional and depositional landforms.

Unit – 2

Geomorphic indicators of neotectonic movements: Stream channel morphological changes, drainage modifications, fault reactivation, uplift–subsidence pattern in coastal areas. Application of geomorphology in various fields of earth sciences, viz. Mineral prospecting, Hydrogeology, Civil Engineering. Geomorphology of India – Origin and evolution of Peninsular India, Extra-peninsular India and the Indo-Gangetic Plain.

Unit – 3

Textural parameters of clastic and non-clastic sediments. Grain size: classification and concept of grade scale. Grain size estimation: direct measurement, sieving and settling methods. Grain size parameters (statistical) and their applications. Grain shape and fabric. Sedimentary structures: Classification and origin. Different types of stratification, deformation structures, erosional structures, biogenic structures, sand dykes and sills: applications in paleo-environmental and paleocurrent studies.

Unit – 4

Mineralogy, classification and depositional environments of conglomerate, sandstone, limestone and mud rock. Diagenesis: processes and evidence in siliciclastic, carbonate and argillaceous rocks. Provenance of sediments. Depositional environments - marine, non-marine, and mixed depositional environments. The association of primary sedimentary structures and textural characteristics with depositional environments and settings. Concept of sedimentary facies, association models. Overview of sedimentary basins; Basin development and classification: Cratonic basins, Divergent margin basins, Convergent margin basins, Downwarp basins. Fore arc and back arc basins. Sedimentary basins of India.

References

- Agrawal, L.C. (2008) Introduction to Geomorphology. Pointer Publishers, 128p.
- Arthur L. Bloom (1978) Geomorphology (A Systematic Analysis of Late Cenozoic Landforms). Prentice-Hall, 510 p.
- Chandra Prakash Singh (2002) Applied Geomorphology: A study. B.R. Publishing Corporation.
- Chorley, R.J., Schumm, S.A. and Sugden, D.E. (1984): Geomorphology, Methuen & Co., 605p.

- Holmes, A. (1993): Holmes Principles of Physical Geology, Edited by P. McL. D. Duff. Chapman and Hall, London; New York, 791p.
- Kale, V.S. and Gupta, A (2012) Introduction to Geomorphology. Anmol Publications, India.
- Ritter, D.F., Kochel, R.C., Miller, J.R. (2006): Process Geomorphology, Waveland Pr Inc., 652p.Huggett, R. (2016): Fundamentals of Geomorphology, Taylor&Francis, 578p.
- Savindra Singh (2018): Geomorphology, Pravalika Publications, Allahabad. 652p.
- Savindra Singh (2017) Physical Geography, Pravalika Publications, Allahabad.
- Sen, P.K. and Prasad, N. (2002) An Introduction to the Geomorphology of India. Allied Publishers Pvt. Ltd, 396p.
- Sharma, H.S. (1991): Indian Geomorphology, Concept Publishing Co., New Delhi, 358p.
- Sparks, B.W. (1979): Geomorphology, John Wiley & Sons Inc, 561p.
- Strahler A. N. and Strahler, A. H. (2008): Modern Physical Geography, John Wiley & Sons, New York, 652p.
- Thornbury, W.D. (1984): Principles of Geomorphology, John Wiley & Sons, 594p.
- Blatt, H., Middleton, G.V. and Murray, R.C. (1980): Origin of Sedimentary Rocks, Prentice-Hall Inc., 768p.
- Collins, J.D., and Thompson, D.B. (1982): Sedimentary Structures, George Allen and Unwin, London, 194p.
- Gary Nichols (2016) Sedimentology and Stratigraphy. Wiley India, 336p.
- Lindholm, R.C. (1987) A Practical Approach to Sedimentology, Allen and Unwin, London, 160p.
- Miall, A.D. (2000): Principles of Basin Analysis, Springer-Verlag, 616p.
- Pettijohn;, F.J. (1975): Sedimentary Rocks (3rd Ed.), Harper and Row Publ., New Delhi, 718p.
- Prothero, D.R., Schwab, F., (2003) Sedimentary Geology. W. H. Freeman; 2nd edition, 593p.
- Reading, H.G. (1997): Sedimentary Environments and facies, Blackwell Scientific Publication, 615p.
- Reineck, H.E. and Singh, I.B. (1973): Depositional Sedimentary Environments, Springer-Verlag, 439p.
- Sam Boggs Jr (2016) Principles of Sedimentology & Stratigraphy. Pearson Education India, 568p.
- Selley, R. C. (2000) Applied Sedimentology, Academic Press, 523p.
- Sengupta, S.M. (2015) Introduction to Sedimentology. CBS Publications, 339p.
- Tucker, M.E. (1981): Sedimentary Petrology: An Introduction, Wiley and Sons, New York, 272p.
- Tucker, M.E. (1990): Carbonate Sedimentology, Blackwell Scientific Publication, 482p.