



Proceedings of the Principal, Government College [A], Rajamahendravaram

Present: Dr.R.David Kumar Swamy, M.Sc, M.Phil., Ph.D

Re. No: Spl./Acad.Cell-GC[A]-RJY/2017-23, Dated: 4 January 2017

Sub:- Government College [A], Rajahmundry – **Boards of Studies (BoS)** – Nomination of Members - Orders Issued.

Ref:- UGC Autonomous Guidelines 2012 -17.

ORDER:

The Principal, Government College [A], Rajamahendravaram is pleased to constitute **Board of studies in GEOLOGY** for framing the syllabi in Geology subject for all semesters duly following the norms of the UGC Autonomous guidelines.

S. No	Name	Designation
1	Lt. D. Rudra, Lecturer In- Charge/HoD, Department of Geology, GC[A], Rajamahendravaram	Chairman
2	All Faculty members in the department	Member
3	Dr. C. Ravi, Lecturer in Geology, CRR College, Eluru	Subject Expert
4	Dr. P. Srinivasulu, O/o Commissioner of Collegiate Education, Vijayawada	Subject Expert
5	Dr. Y. Srinivasa Rao, Dean, CDC, Adikavi Nannaya Univrsity, Rajamahendravaram	University Nominee
6	P.R. Bhavana, DGM, ONGC, Rajamahendravaram	Expert from Industry/Corporate Sector
7	G. Achyuta Varalakshmi	Student Nominee

The above members are requested attend the BOS meetings and share their valuable views, suggestions on the following functionaries:

- Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stake holders and national requirement for consideration and approval of the Academic Council
- Suggest methodologies for innovate teaching and evaluation techniques
- Suggest panel of names to the Academic council for appointment of examiners
- Coordinate research, teaching, extension and other activities in the department of the college.

The term of the members will be two years from the date of the nomination. The Chairman of the BoS (HoD/lecturer In-Charge of the department) is directed to coordinate with the Principal of the College and conduct BoS meetings as and when necessary, but at least once a year.


PRINCIPAL.

**GOVERNMENT COLLEGE [A]
RAJAHMUNDRY**

Copy to:

- The above individuals
- File



**Composition of Board of Studies in Geology
Government College [Autonomous]
Rajahmendravaram**

S. No	Name	Designation
1	Lt. D. Rudra, Lecturer In- Charge/HoD, Department of Geology, GC[A], Rajamahendravaram	Chairman
2	Dr. M.R. Goutham	Faculty Member
3	Dr. C. Ravi, Lecturer in Geology, CRR College, Eluru	Subject Expert
4	Dr. P. Srinivasulu, O/o Commissioner of Collegiate Education, Vijayawada	Subject Expert
5	Dr. Y. Srinivasa Rao, Dean, CDC, Adikavi Nannaya University, Rajahmendravaram	University Nominee
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Department of Geology
Government College [A], Rajamahendravaram

Allocation of Credits

Course: B.Sc.

Subject: Geology

S. No	Semester	Title of the Paper	Hrs./week	Max. Marks	Mid Sem. Exam	Credits
1	Semester-I	Paper-I- Physical Geology & Crystallography	4	60	40	3
2	Lab-I	Physical Geology & Crystallography	2	50	--	2
3	Semester-II	Paper- II- Mineralogy& Optical Mineralogy	4	60	40	3
4	Lab-II	Mineralogy & Optical mineralogy	2	50	--	2
5	Semester-III	Paper -III- Petrology (Igneous, Sedimentary and Metamorphic)	4	60	40	3
6	Lab-III	Petrology (Igneous, Sedimentary and Metamorphic)	2	50	--	2
7	Semester-IV	Paper-IV- Structural Geology & Stratigraphy	4	60	40	3
8	Lab-IV	Structural Geology	2	50	--	2
9	Semester V	Paper-V- Palaeontology & Indian Geology	4	75	25	3
10	Lab -V	Palaeontology & Indian Geology	2	50	--	2
11	Semester V	Paper VI – Economic Geology	3	75	25	3
12	Lab VI	Economic Geology	2	50	--	2
13	Semester VI	Paper VII- Groundwater : Geology & Exploration (<i>Elective</i>) (OR) Field Geology (<i>Elective</i>)	3	75	25	3
14	Lab VII	Groundwater Geology & Exploration (OR) Field Geology	2	75	25	2
15	Semester VI (Cluster 1)	Paper VIII- <i>Cluster Electives*</i>				
		VIIIA -1: Introduction to Mineral Exploration	3	75	25	3
		VIIIA-2: Environmental	3	75	25	3
		VIIIA-3: Introduction to Remote Sensing & GIS	3	75	25	3
16	Cluster 1 Lab	VIIIA -1: Mineral Exploration	2	50	--	2
		VIIIA-2: Environmental Geology	2	50	--	2
		VIIIA-3: Project Work	2	50	--	2
17	Semester VI (Cluster 2)	VIIIB-1: Elements of Geochemistry	3	75	25	3
		VIIIB-2: Introduction to Mining Geology	3	75	25	3
		VIIIB-3: Introduction to Remote Sensing & GIS	3	75	25	3
18	Cluster 2 Lab	VIIIB-1: Geochemistry	2	50	--	2
		VIIIB-2: Field Report	2	50	--	2
		VIIIB-3: Project work	2	50	--	2

Chairman, BOS



(D. RUDRA)

The Board of Studies of **GEOLOGY** met on 10 April 2017 at 11-00 A.M in the department of Geology on under the chairmanship of Lt.(Smt) D. Rudra and the following resolutions were adopted.

Resolutions

1. It is resolved to continue with the Modular & Choice Based Credit System (CBCS) for the Academic Year 2017-18 by adopting syllabus prescribed by Adikavi Nannaya University, Rajamahendravaram for I and II semesters (I year) and approve the syllabus and model question papers for the same.
2. It is also resolved to approve and follow the syllabi for II & III year B.Sc. (III, IV, V & VI semesters) in the earlier pattern, i.e. approved in BOS meeting held on 1 April 2016.
3. It is resolved to approve the model question papers for the I semester with 60 marks for Semester end examination and 40 marks for internal assessment as approved by the Staff Council of the College. The split up of the marks is shown below. The existing examination pattern will be followed for I and II year students (i.e. for I, II, III and IV Semesters).

Semester End Exam (60 Marks)		Internal assessment (40 Marks)
PART	Allotted Marks	
PART A: This Part contains 4 Essay type internal choice questions numbering 1 to 4 will be asked Unit 1 to 5. Student has to answer all the 4 questions. Each question carries 8 marks.	4 x 8 = 32 Marks Question 1 A or B from Unit I Question 2 A or B from Unit II Question 3 A or B from Unit III Question 4 A from Unit IV and or B from Unit V	Written Test : 25 Marks Assignments: 5 Marks Seminar: 5 Marks Viva-Voce: 5 Marks
PART B: This Part contains 8 Short answer questions numbering 5 to 12 will be asked covering all the units. Student has to answer any 5 out of 8 questions. Each question carries 4 marks.	5 x 4 = 20 Marks Questions 5, 6,7,8,9 are from Units I, II, III, IV and V respectively. Questions 10,11, 12 are from all 5 units depending on the weightage of the unit	
PART C: This Part carries 8 marks. 4 very short answer questions numbering 13 to 16 will be asked covering all the units. Student has to answer all the questions Each question carries 2 marks	4 x 2 = 8 Marks	
Total Marks	60	40

4. It is resolved to approve the list of examiners & paper setters for 3 years
5. It is resolved to make Geological Field Trips compulsory for III B.Sc. Students as per the norms given by the affiliating university.



6. It is resolved to strictly follow the Annual Curricular Plan submitted to the College
7. It is resolved to continue the in house news letter “*GeoNews*” which was started during last academic year (2014-15).
8. It is resolved to dispense with the *Environmental Geology*’ which is ‘Inter-disciplinary elective’ for the second year non geology students, which was initiated from the academic year 2015-16.
9. It is resolved to put forth before BOS the proposal of starting a Certificate/Diploma course in “**Groundwater Exploration**” depending on the collaboration with A.P. State Groundwater Board.

The following members were present.

S. No	Name	Designation	Signature
1	Lt. D. Rudra, Lecturer In- Charge/HoD, Department of Geology, GC[A], Rajamahendravaram	Chairman	
2	Dr. M.R. Goutham	Faculty Member	
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7	G. Achyuta Varalakshmi	Student Nominee	

Chairman, BOS
(D. RUDRA)

List of Examiners & Paper Setters



S No	Name of the Examiner/Paper Setter	College	Experience	Paper Taught
1	Dr. C. Ravi	Sir CRR College, Eluru	36 Yrs	Economic Geology, Structural Geology, Petrology
2	Sri P.C. Swaroop	Sir CRR College, Eluru	33 Yrs	Physical Geol., Mineralogy, Palaeontology, Groundwater Geology
3	Sri N. Ravi Kumar	Sir CRR College, Eluru	30 Yrs	Crystallography, Indian Geology
4	Sri A. Surendra	DNR College, Bhimavaram	33 Yrs	All branches of Geology
5	Sri P.A.N. Raju	Maharaja College, Vizianagaram		
6	Sri U. Padmanabha Raju	Maharaja College, Vizianagaram		

University Nominee:

(Y. SRINIVASA RAO)

Industrial Nominee:

(P.R. BHAVANA)

Local Nominee:

(C.RAVI)

Staff Member:

(M.R. GOUTHAM)

Chairman, BOS:

(D.RUDRA)

GOVERNMENT COLLEGE (AUTONOMOUS), RAJAMAHENDRAVARAM.

III B.Sc., GEOLOGY SYLLABUS (2017-18)

VI SEMESTER



Module VIII –Petroleum Geology (Elective)

Unit – 1: Geological Methods - Field Mapping

Essential elements that control origin and occurrence of petroleum.

Location of areas, setting of base camp- Reconnaissance survey of the area, Geological mapping and Traversing. Measurement of the strike, dip and apparent thickness of the outcrops. Data plotting, compilation and interpretation of subsurface geology. Preparation of litho stratigraphic columns, litho stratigraphic correlation, geological cross sections and structure contour maps – Application of Remote Sensing techniques in Hydrocarbon exploration.

Unit – 2: Source Rocks

Definition of source rock.: Organic rich sediments as source rocks. Nature and type of source rocks - Claystone / shale. The process of diagenesis, catagenesis and metagenesis in the formation of source rocks. Evaluation of petroleum source rock potential. Limestones as source rocks.

Coring in claystone/shales for source rock evaluation. Subsurface pressure temperature conditions for the generation of oil and gas from the source sediments. Oil window.

Reservoir Rocks

Characteristics of Reservoir rocks – classification and nomenclature:

Clastic Reservoir Rocks, Carbonate Reservoir Rocks, Unconventional, fractured and miscellaneous reservoir rocks. Marine and non marine reservoir rocks.

Reservoir pore space - porosity – primary and secondary porosity, Effective porosity, fracture porosity - permeability – effective and relative permeability - Effects of diagenesis on reservoir quality, reservoir continuity- Relationship between porosity, permeability and texture.

Classification and origin of pore space – Recrystallisation – Dolomitization phenomenon – Cementation and compaction – Artificial or man made porosity and permeability.

Cap rocks: Definition and characteristics of 'cap Rocks'.

Unit – 3: Hydrocarbon migration

Geological framework of migration and accumulation. The concept of hydrocarbon migration from source beds to the carrier beds - Carrier beds to the reservoir - Free-path ways for migration - Short distance and long distance migration - Evidence for migration – oil and gas seepages.

The concept of buoyancy, capillary pressure and wettability in the process of migration of hydrocarbons – Tilted oil water contacts – Spill point.

Primary and secondary migration- Migration and accumulation of hydrocarbons – Lateral migration and vertical migration – Factors effecting primary and secondary migration – Time of accumulation.

Unit – 4: Entrapment of hydrocarbons



Mechanics of entrapment of hydrocarbons - Traps in the path of migration, entrapment and accumulation of hydrocarbons - Classification and types of traps: Structural, stratigraphic and combination type of traps- Genesis of various types of Traps – The anticlinal theory – traps caused by folding – Traps caused by faulting – Traps caused by fracturing.

Primary Stratigraphic Traps – Lenses and facies in chemical rocks – Porous carbonate facies – Organic reefs – Modern reefs – Fossil reefs – Productive reefs – Secondary stratigraphic traps – Salt domes – Origin of salt domes – Traps associated with salt domes.

Texts / Reference Books

1. Hobson, J.D. and Tirastoo, E.N. 1975. Introduction to Petroleum Geology, Scientific Pub; Becons Field.
2. Levorsen, A.I. Geology of Petroleum, 1967, 2nd Edn. W.H. Freeman C. San Francisco.
3. Hunt, J.M., Petroleum Geochemistry and Geology, 1996, 2nd Edn. W. H. Freeman, San Francisco.
4. North, F.K., 1990. Petroleum Geology, Unwin Hyman (Pub.), Boston, USA.
5. Richard, C. Selley, 1998. Elements of Petroleum Geology, Academic Press, London.
6. Chapman, R.E. Petroleum Geology. 1983, Developments in Petroleum Science, Ser. 16, Elsevier, Amsterdam.
7. G.D.Hobson (Ed.). Developments in Petroleum Geology, Vol. I, 1997, Vol. II 1980, Applied Science Publishers, London.
8. Dickkers, A.J. 1985. Geology in Petroleum Production, Development in Petroleum Science – 20, Elsevier Pub., Amsterdam.
9. Welte, D.H. Harsfield, B. and Baker, D.R. 1997. (Eds.). Petroleum and Basin Evolution, Springer-Verlag, Berlin.
10. Guillemot, J. 1991. Elements of Geology – Oil and gas exploration techniques. Technip Pub., Paris.
11. Lahee, F.H. 2002. Field Geology, 16th Edn., CBS Publishers, New Delhi.
12. John Barnes. 2003. Basic geological mapping. John Wiley, London.