Summary Report

About Department/Center/School:

1. **Academic Programs (Range of Degrees and Disciplines):**

2. **Major 4-5 Thrust Areas of Research:**

3. **Curriculum and Courses & Teaching Environment**

Items	**Ratio/ Number**	**Items**	**Number/%**
Teacher-student Ratio	1:12	Average No. of students motivated (%) to opt of careers Eng/ Tech. Sectors UG/PG/PhD	**NA**
No. of Faculty members as on today	25	Average No. of students motivated (%) to opt of careers in Science sectors UG/PG/PhD	40/60/80
Average No. of Tutorial Assistants	N/A	No. of teaching labs	2
No. of UG/DD students	300	Average No. of students per experiments in core courses	4
No. of PG students/PhD students	60	No. of Students' workshops/``Tinkering'' Labs	As and when required
Average no. of tutors with more than 100 students	N/A	No. of new courses introduced	6
Average Students placements (%) (UG/DD/PG)	70/00/60	No. of New program introduced	1
No of major curriculum review in both UG & PG level	2	Undergraduate Vs PhD strength expressed as Percentage	20
No of UG lab (teaching labs) developed/set-ups	20	No of PG/research labs developed/new set up	2
No of E class rooms		No. of lab classes per week	14
Average No. of Course done per student for M.Sc/Ph.D.	21/5	No. of core/elective/seminar/projects subjects taken for M.Sc/Ph.D respectively	12/7/2

4. Research and Development & its Environment

Items	**Number**	**Items**	**Number**	**Items**	**No.**
Total No. of Publications in Journals (2008-13)	234	Average no. of citation per paper	6	No of large interdisciplinary research projects	3
Total No. of Publications in Conference & Symposium	550	Average Journal publication per year	47	Number of Int. conf./workshops attended by students	12
Total No of Books & e-books published	3	h-Index of the department since 2008/overall h-index	19	No. of PDF hired in the Institute	nil

		in Scopus			
Total No of Edited Conference Proceedings/book chapters	11	Number of papers with citation more that the average no. of citation of the Journals	102	No. of international Students as PhDs/PDFs	1
Total No. of Technology Developed/transferred	nil	No. of recognitions & Awards, fellows etc to faculty/students (provide break up if necessary)	27/1	No. of International visiting researchers/adjunct faculty stayed here for at least a week	5
Total No. of Patents Filed/Obtained		Average Retention(%) of Young faculty for at least 10 years	18 nos.	No. of short courses/workshops /conf. organized with international participations	3
Total No. of Copyright Filed/Obtained	nil	No. of Sponsored research Project /fund(lakh) generated from non-internal source	72/2500	Average No. of PhD granted per year	5
No. of Publications per Faculty/Masters/PhD students	9/1/2	No. of Consultancy /fund (lakh) generated from non-internal source	28/1020	Average No. of PhD Granted per year per faculty	0.4
No. of Publications per Faculty/Masters/PhD students in Top Ten Journals as Identified by the department	30	No of Internal and external Collaborations research papers/research projects/PhD students	42/9	Patent granted per faculty	
Average No. of Citation per faculty per year	10	No of M. Tech students motivated into pursuing PhD/PhD graduates motivated to pursue career in Academics(abroad or IIT etc)	2	Number of articles in collaborations with Ten countries*	40
Ranking of the department in terms of average citations per paper within the Institute	10	Ranking of the department in terms of total number of Journal publications within the Institute/publications per faculty	10	No of articles of the dept. contributing towards h-index of the Institute since 2008	210

5. External Stakeholder Engagement and others

Items	**Number**	**Amount Lakh**
No. of PhD/Master students' thesis funded by Industries	Nil	
Total number of Industry sponsored projects and its income (Lakh)	8	120
No. of Curriculum Development Initiative for Industries		
No of Technology transfer/adopted by Industry/Labs		
No. of Nationally relevant research projects	10	60

No of Policy inputs/consultancies provided	2	
No. of Research grant and seed money from internal savings of the Institute per young faculty of the department and its total fund		
No. of Community Relevant projects	5	

6. Vision for the Future (in brief):

(a) Departments/centers/schools should spell out its Mission and Vision Statements, (b) Plans for future to achieve the projected goals and (c) measures adopted towards above.

The Department is looking forward to focus on the emerging areas of Applied Geosciences like (a)Applications of Isotope Geosciences and Geochronology, (b) Energy Resources, Conventional and Unconventional, its Exploration, Production and Remediation , (c) Mineral Exploration using geological and geophysical techniques and (d) Hazard Analysis viz. Seismic Hazard, Radioactive Hazard and Radionuclide Fall-out, Hazard Analysis due to Landslides .

In Fundamental Geosciences the areas in which the work would be focused are (a) Paleoclimatic studies with special reference to Monsoon and paleo-temperatures, (b) Hydrogeology of groundwater aquifers and contaminant modeling, (c) Genesis of ore deposits and ore body modeling, (d) Studies on deformation/ micro-deformation including engineering geology and its implications, (e) Geophysical studies on the crust, mantle and studies on core/crust-mantle interactions.

7. External peer review of the Dept./centre/schools (in brief):

(a) Date of the peer review: 25th February 2013-26th February 2014

(b) Name of the Experts involved and their affiliations in short:

1. Prof. Dhrubajyoti Mukhopadhyay, INSA Honorary Scientist, University of Calcutta
2. Prof. B.B. Bhattacharya, INAE Distinguished Professor, S.N. Bose National Centre for Basic Sciences, Kolkata
3. *Prof. Rajendra Prasad, Sir Arthur Cotton Geospatial Chair Professor, Dept. of Geophysics Andhra University.*
4. *Prof. P.K. Bose, Ex-Head, Dept. of Geological Sciences,, Jadavpur University*
5. *Dr. Rahul Dasgupta, Head-**NEF**, Oil India Ltd., Duliajan, Assam*

(d) Measures adopted/action taken at the department level to address the recommendations of the peer review report:

The Department deliberated in detail on the report provided on 12th Feb. 2013. The observation provided regarding the "Field essentials' has already been complied with, by our Department by providing high quality Clinometers, hand-held GPS units etc. The remaining aspects like overlapping of course content, introduction of new and applied courses, is being addressed shortly with due deliberation with our Faculty Members.

8. **Strengths, Weaknesses, Opportunities & Threats (SWOT) Analysis of the Department**

STRENGTHS 1. Only Department in the country with an extensive integration of Geology & Geophysics, in Research and Teaching. 2. Committed and Excellent Faculty who are well known for the research work. 3. In terms of yearly publication probably the maximum productive department in the country. 4. Developed state-of-art Labs, which are functional for most part of the year. 5. State-of-art Research Scholar's room with internet and research work discussion/interaction facilities, available. **WEAKNESSES** 1. In Geophysics seismic/seismology experts are more. More balanced expertise is needed in terms of other techniques like electrical, electromagnetic and radiometrics. In addition integrated and mathematical modeling of geological/geophysical data to be addressed. 2. More expertise in conventional and non-conventional energy resources, is needed, specifically in areas like Exploration and Remediation. 3. Effective use of technical assistants and build a strong working team with our research scholars for effective and optimal use of the available experimental facilities.	**OPPORTUNITIES** The peer review committee wanted a closer interaction with the industry counterparts for mutual benefit. The Department took a pro-active approach in this regard and has initiated significant industry-academic interaction (related to our Department) with O.N.G.C., Schlumberger, Cairns India Ltd., Essar Oil India Limited to name a few. The latter association is specifically for Unconventional energy resources like Coal Bed Methane and Shale Gas. **THREATS** 1. More attractive opportunities in other IIT's and IISER's, in terms of additional infrastucture available in metros/cities where located and minimal teaching/academic load. 2. Lack of good quality faculty may inculcate mediocrity to overtake excellence. This is also important as the class strength in the IIT's is expected to increase in the coming years.

9. Additional Information, if any

The Department has been successful in establishing strong interactions with the Industry in our country. To name a few a robust work flow has been established for 'Reservoir characterization' using **Intelligent networks** for the Oil and Gas Industry. Probabilistic Seismic Hazard Analysis for various nuclear plants in India primarily for Nuclear Power Corporation of India Limited. Another important is Department's strength in undertaking 'Seismic Micro-zonation of large cities" sponsored by various government agencies. In addition the Department has been actively participating in various multi-disciplinary projects on Geo-heritage, Science for Society and some specific aspects of geo-analytics. Apart from these areas, the Department has initiated studies on Planetary Geosciences with special emphasis on the Lunar and Martian surface.

***Note: Ten countries: US, UK, Germany, Japan, Canada, France, Italy, Australia, Singapore, South Korea**

Important Highlights

Editorial board members from G & G:

- **Associate Editor:**
  - **Journal of Earth System Science (Springer):**
  - **Journal of Hydrology (Elsevier):**
  - **Applied Geochemistry (Elsevier):**
  - **Frontiers in Environmental Sciences:**
  - **Groundwater Resources (Nature Publishing Group and Frontiers):**
- **Editorial Board Member:**
  - **International Journal of Earthquake Engineering and Hazard Mitigation:**
  - **ISET Journal of Earthquake Technology:**
  - **Brazilian Journal of Paleontology:**
  - **Journal of the Geological Society of India:**
  - **Fast Track Articles-Journal of the Geological Society of India:**
  - **Indian Journal of Geosciences:**
  - **Journal of the Virtual Explorer:**
  - **Indian Journal of Geology:**
  - **Himalayan Geology:**
  - **Resource Geology:**
  - **Prakruti Vikash:**
  - **Journal of the Geological Society of India:**
  - **Journal of the Geological Society of India:**
  - **Fast Track Articles-Journal of the Geological Society of India:**
  - **GEOPHYSICS: The Scientific World:**

Our Research

We Are Passionate About It !

- 70 research scholars
- More than 50 sponsored research projects and consultancy in the past 5 years with a total value of ~40 crores
- More than 250 research papers in the past 5 years
- 45 Ph.D. degrees awarded in the last 5 years

Our Teaching Tools

- Well furnished class rooms equipped with projectors (OHP as well as LCD)
- Well equipped petrography and micropalaeontology (students) laboratories with large number of microscopes, digital image analysis facility and TV screen
- Well equipped Electrical and electromagnetic lab
- Nuclear Geophysics lab
- Remote Sensing lab
- Several Gravity meters
- Geochemistry lab
- Well equipped computational facility
- Strong field component (Fieldwork in 2nd, 3rd, 4th and 5th years).
- Evaluation through Projects, Seminars, assignments and Comprehensive viva-voce
- State-of-the-Art Research Scholar Room