

# **Executive Summary of the Review of the Department of Earth Sciences**

## **Preamble**

A three-member-committee reviewed the overall performance of the Department of Earth Sciences for the period 2008-2012 on 7<sup>th</sup> and 8<sup>th</sup> February, 2014. The members of the review committee included Prof. S.S. Rai, FNA ( NGRI, Hyderabad), Prof. G.V.R. Prasad, FNA(Univ. of Delhi) and Mr. Joeman Thomas (Exec. Director(Retd.) ONGC Videsh Ltd.). The Head of the Department made a detailed presentation highlighting the various performance indicators and growth of the department on various fronts such as the addition of faculty in newer areas of specializations, increased student intake, funding for research and national facilities, research and book publications, awards and distinctions to faculty. Presently, the department has 20 regular faculty and several visiting/emeritus professors. The department offers M.Sc (Applied Geology) and M.Sc.(Applied Geophysics) as UG programmes and M.Tech in Geoexploration and Petroleum Geology respectively as PG programmes in addition to the Ph.D. and M.Sc.-Ph.D. dual degree programmes. The department is well equipped with the state-of-art laboratory facilities including two major national facilities - the <sup>40</sup>Ar/<sup>39</sup>Ar mass spectrometer for geochronology and the EPMA for mineral chemistry respectively. The department enjoys substantial financial support of about Rs.540/- lakhs per annum from various government agencies through sponsored research. The faculty regularly publish their research in peer-reviewed high impact SCI journals of international repute and have an annual publication record of 2.5 journal papers per faculty. These research contributions are duly recognized at the national as well as international level in terms of several national awards such as the Bhatnagar prize, National Geoscience award, Young investigator award, Krishnan medal and several international research fellowships. The faculty of the department have also been serving the public sector undertakings and national institutions as board of directors and governors and in advisory committees and some are serving the editorial boards of journals. During the period of assessment (2008-2012), nearly 70% of students were hired by leading companies/organizations and over 10% of the students pursued research in India/abroad.

## **Observations of the Committee**

The committee critically evaluated the curriculum that is taught at the UG and PG levels and appreciated its content, design and relevance to both industry and academia. They also noted that the department

periodically introduces new courses in emerging areas of research at both UG and PG levels. The committee interacted with the UG, PG and research students and elicited their views and grievances. The committee noted that the department is equipped with excellent laboratory facilities in a wide range of specializations with state-of-art equipment which are used for teaching and are also made accessible for student projects, thereby fostering a strong faculty-student interaction that is necessary for a healthy academic ambience. Considering the overall performance of the department in terms of teaching and research, the review committee commended the department with a rating of 8.5 out of 10 and suggested diversifying the research areas to various emerging fields of geosciences in order to make a mark at both national and international level.

## **Recommendations of the Committee**

### **Academic**

- Improve research at UG level, increase electives, deliberate on offering an in-house course on computer programming to address the application needs of Earth Sciences.
- Need to recruit post doctoral fellows to enhance research.
- Explore the possibilities of an integrated B.S.-M.S. program by restructuring the existing courses in terms of a possibly unified Earth Sciences program with common core courses for geology and geophysics and their specializations.

### **Infrastructure**

- Need to create work space for research scholars.
- Need of a good e-class room.
- Two members were of the opinion that special efforts are required to equip the department with high end instruments such as TIMS and IRMS for characterization of earth material and to complement the existing facilities in Isotope Geochemistry and one member opined that GCIRMS should be procured for enhancing research in organic geochemistry. The committee also suggested developing a Petrophysics laboratory.
- In view of the high rate of growth in terms of facilities, faculty and students, all the three committee members specifically stressed upon the need to acquire more space to meet the demands of the current and future requirements.

## **Research**

The committee members were unanimous in emphasizing the need to recruit faculty in critical areas of research which are presently unrepresented in the Department such as Hydrology/ Hydrogeology, Petrophysics and Reservoir Geoscience. Additionally, individual members separately proposed strengthening other areas of research by recruiting faculty in research areas such as Computational Geodynamics, Geo-system modeling, Isotope Geochemistry, Geothermics and Geophysics.

## **Response and Proposed Plan of Action**

The recommendations of the committee are in sync with the vision of the department and we propose to address and implement them in all the three areas i.e., academic, infrastructure and research. The department does carry out an in-depth review of the course content on a regular basis, once in five to eight years and we propose to review all the UG and PG programs in the immediate future and also consider offering more electives and increasing the course credits and contact hours. A course on “Applied Geology for Civil Engineers” has also been designed to cater to the needs of the Department of Civil Engineering and will be put up to the senate for approval. The department has already initiated a debate on the feasibility of an integrated B.S.-M.S. program through JEE and we propose to deliberate on this important issue and also involve the primary employers such as the Geological Survey of India and ONGC for their feedback. The major concerns and challenges in initiating a B.S.-M.S. program lie in recruiting quality faculty in several areas of Geology and Geophysics, providing laboratory space for the new faculty, catering to increased student strength and importantly their employability. Presently, the department requires more space even to accommodate its existing faculty and their laboratories and proposes to seek more space from IITB. The department is actively involved in the search for suitable candidates with the required expertise for faculty positions in our department. The department has already placed a rolling advertisement in several of the fields mentioned by the experts which include hydrology, isotope geochronology, theoretical geophysics/geophysical modeling and seismic/seismology. The department echoes the recommendations of the expert committee and is keen on exploring new research opportunities in the frontier areas of earth sciences.

Prof. G.Mohan

(HOD)