

Programme and Learning outcome

The fundamental premise underlying the learning outcome-based approach to curriculum planning and development is that higher education qualifications, such as a Bachelor's Degree programmes, are awarded on the basis of demonstrated achievement of outcomes (expressed in terms of knowledge, understanding, skills, attitudes and values) and academic standards expected of graduates of a programme of study. Learning outcomes specify what graduates completing a particular programme of study are expected to know, understand and be able to do at the end of their programme of study.

The graduate attributes reflect the particular quality and feature or characteristics of an individual, including the knowledge, skills, attitudes and values that are expected to be acquired by a graduate through studies at the higher education institution (HEI) such as a college or university. The graduate attributes include capabilities that help strengthen one's abilities for widening current knowledge base and skills, gaining new knowledge and skills, undertaking future studies, performing well in a chosen career and playing a constructive role as a responsible citizen in the society. Following are the major attributes, expected to be demonstrated by a graduate, considered at the time of formulation of the curriculum:

1. **Disciplinary knowledge:** Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.
2. **Communication Skills:** Ability to express thoughts and ideas effectively in writing and orally, and to communicate complex information in a clear and concise manner to others.

Presentation and group-discussions have been introduced in the regular course to achieve this goal.

3. **Critical thinking:** Capability to apply analytic thought to a body of knowledge, analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence, identify relevant assumptions or implications, formulate coherent arguments, critically evaluate practices, policies and theories by following scientific approach to knowledge development.

With a view to develop this skill, specific problem-based assignment has been introduced as a mandatory component of each course.

4. Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

Project work has been introduced to encourage the development of the problem-solving ability.

5. Analytical reasoning: Ability to evaluate the reliability and relevance of evidence, identify logical flaws and holes in the arguments of others, analyse and synthesise data from a variety of sources, draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.

Some of the assignments are review-based to develop this skill of analytical reasoning.

6. Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesising and articulating. Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.

This is to be nourished by the supervising teacher during individual project work.

7. Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

During compulsory field training programme, the students have to carry out geological mapping in small groups. This helps them to develop the skill of working in a group. However, the success largely depends on the individual personality and basic approach to the life.

8. Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

This is significantly covered under the project work.

9. Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

Computer application has become a mandatory part of the present-day learning process. Students are being introduced to the application of different software including word processing, data processing, drawing, image analysis, application of GPS and GIS etc. at different stages of learning.

10. Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

It is being taken care of in two ways. During problem-based assignments the students has the freedom of self-directing leaning. They are also encouraged to write articles for *Geolozine*, the biennial journal of the Association for the Culture of Earth Sciences (ACES), a student organization of the department, and is used as a platform for expressing their ideas.

11. Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

During writing scientific articles for *Geolozine*, the students are specially trained in the procedure of writing research and review articles; are also exposed to the concept of plagiarism, the most serious intellectual offence. This process of generating creative content not only introduces them to the art of critical reading of books and research publications but also exposes to research, another career option.

12. Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

During compulsory field training programme, the students are allowed to organize the infrastructural facilities. This helps in nourishing the leadership quality within them. They also run an organization, the Association for the Culture of Earth Sciences (ACES). Besides the academic practices, this has a positive contribution in development of management faculty within the students.

13. Lifelong learning: Ability to acquire knowledge and skills, including 'learning how to learn', that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.

The department believes in the basic philosophy of teaching in the institutes of higher learning – 'not to teach, but to help the students to learn'. Hence, through their day-to-day teaching practices the teachers implant the ability of self-learning within the juvenile minds.

Programme learning outcomes include subject-specific skills and generic skills, including transferable global skills and competencies, the achievement of which the students of a specific programme of study should be able to demonstrate for the award of the degree qualification. The programme learning outcomes must also ensure that the acquired knowledge and skills must prepare students for further study and employment. The Department of Geology is committed to disseminate the best possible education to its students bring up them as a complete professional in all its senses. Hence, a special care is being taken on the learning outcome of the programmes.