



## Mapping in the Postgraduate Syllabus of Geology: Vision NEP-2020

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### Abstract

Curriculum mapping is a crucial process in education, aiming to align resources, activities, assessments, instruction, and educational reforms with a program. It helps in identify and rectify the gaps, redundancies, and misalignment in course content, improving the overall coherence and effectiveness of a course. Further in the experimental and field study-related program, it is not only essential to perform an eventual mapping for each course but also significant to develop an effective learning module. A good curriculum considers student abilities, goals, institution expectations, course materials, and time duration. This paper highlights the importance of curriculum mapping for the effective implementation of NEP 2020 in Geology.

**Keywords:** NEP 2020, curriculum mapping, higher education, geology

### Introduction

A course of study is created in education to efficiently impart topic knowledge to students. The purpose of education is to help students comprehend and remember the material by teaching them the curriculum as instructed. Nonetheless, classes with an ever-evolving curriculum typically yield the highest outcomes. In addition to the length of the study, teachers might find areas in a curriculum that need improvement by watching the teaching and learning process. Additionally, addressing these areas for improvement over time can raise the standard of instruction provided in a course. Content mapping is a popular technique for changing a course's content. The process of matching resources, activities, evaluations, instruction, and educational changes with a program is known as curriculum mapping. It is described as the process of indexing or diagramming a curriculum to identify and address any gaps, repetitions, or misalignments in the course material. This activity contributes to increasing a study program's overall efficacy and coherence. A curriculum's main goal is to structure the way a subject is taught and provide students with the opportunity to learn more by their goals and the degree of information that is needed. An effective curriculum takes into account the skills and objectives of the students, the administration's expectations, the course materials, and the amount of time allotted for each subject. This study outlines the necessity of curriculum mapping for the successful execution of NEP 2020 in the field of Geology.

### Curriculum Highlights

General Characteristics of a Good Curriculum

In general, a good curriculum consists of the following characteristics

- i). Well organized and purposefully designed for effective learning.
- ii). Adaptation of lessons, courses, subjects, and graduate levels.
- iii). Does not repeat concepts and content.
- iv). Defined goals and outcomes.
- v). No academic gaps.
- vi). Adapting current reforms like NEP 2020.

### Methodology

- i). **Building an Organized Path:** For subjects like geology, curriculum mapping is essentially creating a road map that teachers and students must follow during the course. Curriculum mapping defines the starting and the endpoint of the course and the various milestones that students must achieve on the way. In the present work, the experience of authors during teaching at graduate and postgraduate levels in Geological science has been opted as a tool to identify the path.
- ii). **Alignment with Standards:** Every educational establishment has certain expectations that it must meet. The level of education they are required to deliver may be determined by their association with a government education department or a university. Curriculum mapping helps teachers stay focused on the end aim of

the lesson by defining the standards. Everyone can see the course's objectives and focus. As a result, instructors and students can collaborate to work toward the course objectives and produce the intended results. The locational needs of the initial learners from the social background have been taken into consideration in the current work.

- iii). **Improves Communication & Collaboration:** When a student starts a new level of a course, teachers can better comprehend their prior knowledge and comprehension thanks to a curriculum map. The curriculum design that results from teachers from several subject areas working together on a curriculum mapping exercise is in line with the overall goals of student learning.
- iv). **Map Student's Progress:** A curriculum map outlines the various benchmarks that students must meet during their educational journey. A clear curriculum map can help students see the objectives they must meet as they move through the course. This makes the standards for the pupils clear and contributes to making progress measurable.
- v). **A Reflective Practice Tool:** Through the process of curriculum mapping, educators can evaluate the previous year's teaching and learning experiences. They can evaluate the course material and its applicability, the learning objectives, and the extent to which the material has satisfied the needs of their pupils.
- vi). **Improve Students Learning Experience:** To enhance the learning process for students in a course, a curriculum mapping activity is necessary. Numerous instances when the course can be better matched with student expectations can be found by taking a backward look at the previous year. To keep the program relevant over time, the course material can be improved and changed.
- vii). **Curriculum Flexibility:** The development of Core, Open, Zero Credit, Program or Department Elective, and Audit Courses is important for this reason. This facilitates the definition of courses within various categories, allows students to choose the courses that best suit their needs, and supports a fully flexible credit system-which is also in line with the most recent NEP 2020 revisions.

The programme offers essentially the fundamental and advanced knowledge and technical skills on various domains of geology. Students would study core and applied aspects of, and recent technological advances in the subject field. The curriculum of the programme is designed in such a stepwise manner that the student can derive benefit at any stage of the programme even if the entire course is not completed; it begins with basic essential knowledge and gradually covers advanced aspects of the subject.

## Results and Discussions

A course map outlines how the objectives, assessments, and instruction in the course are required concerning the core components. Geological sciences sub-processes that occur within systems. Geology is an ever evolving and most common branch of pure and applied science amongst the students having keen interest and curiosity in accepting the origin, evolution, nature, composition, structure and processes of the Earth and its environs through time. The identification of rocks, minerals and fossils provide visions into the age, structure, composition and paleoenvironment of the Earth and life that flourished on it through past ages. A thorough knowledge on various domains of geology is, therefore, immensely useful in not only enriching our knowledge about various physical and historical aspects of the Earth's evolution and dynamics, but also in sensibly utilizing its valuable natural resources as well as proficiently preventing or mitigating disasters that could be caused as a result of the Earth's powerful endogenic and exogenic processes.

The curriculum of the programme is to be in such a stepwise manner that the student can derive benefit at any stage of the programme. It should begin with basic essential knowledge and gradually covers advanced aspects of the subject. At the end of every academic year, the student would have good knowledge of some basic and applied aspects of the subject, and this will keep on growing as the students proceeds further with the subject course. At a later stage of the course, the curriculum should be in a manner to provides the student with an opportunity of carrying out field or laboratory based projects leading to a dissertation in a specialized domain of geology, which is actually a training of making a professional geologist competent in generating, analyzing and synthesizing the data, to determination geoscientific problems.

At the postgraduate level, students gain an understanding of these processes at both the micro and macro levels through the intensive study of material, fossils, rocks and analytical techniques etc. Students are expected to apply these concepts to real-world phenomena to better understand causes, effects, and solutions for physical processes in the real world. It is also assumed that students will be able to understand ethical and social learning through projects, seminars, and tutorial works. The present studies are indicative of the further designing of the curriculum after mapping.

**Table 1:** General Geological Mapping Templates

Required Courses	Students will be able to evaluate assets for efficient distribution	Students will be able to prepare a plan for efficient wealth creation and management through chemicals and reactions	Students will be able to assess the impact of principles and policies on the different stakeholders	Students will be able to design portfolios of securities and asset classes aimed at achieving personal goals	Students will be able to design plants, processes etc. independently
GO-1					
GO-2					
GO-3					
GO-4					
Lab-1					
Lab-2					

Table 2: Mapping Stage 1

Required Courses	Students will be able to evaluate assets for efficient distribution	Students will be able to prepare a plan for efficient wealth creation and management through chemicals and reactions	Students will be able to evaluate the impact of principles and policies on the different stakeholders	Students will be able to design portfolios of securities and asset classes aimed at achieving personal goals	Students will be able to design plants, processes etc. independently
GO-1	X		X		
GO-2		X		X	
GO-3	X	X	X	X	X
GO-4	X		X		
Lab-1		X		X	X
Lab-2		X		X	X

Table 3: Mapping Stage 2

Program Learning Outcomes					
Required Courses	Student will be able to evaluate assets for efficient distribution	Student will be able to prepare a plan for efficient wealth creating and management through chemicals and reactions	Student will be able to evaluate the impact of principles and policies on the different stakeholders	Student will be able to design portfolios of securities and asset classes aimed at achieving personal goals	Student will be able to design plants, process etc. independently
CO-1	I		I		
CO-2		I		I	
CO-3	I	I	I	I	I
CO-4	R		R		
Lab-1		R		R	A
Lab-2		R		R	A

**Introduced (I):** The skills associated with the program outcome are presented in the course. Reinforced (R)-The skills associated with the program outcome are being worked on at a level above the introductory stage and/or the skills are being developed at a deeper level.

**Assessed (A):** Students should have developed a sufficient level of competency in the skills associated with the program outcome to have mastered them.

### Conclusion

In the geological sciences, it is the first effort of its kind. To achieve this goal, the National Education Policy of India 2020 is implementing creative policies to raise the standard, appeal, affordability, and supply of higher education by allowing the private sector to participate while also enforcing stringent quality control measures in all higher education establishments.

According to this perspective, reformative studies on the evaluation and assessment system are required. A small sample size was used to investigate the significance of the proposed tetrahedral assessment system for the overall evaluation, assessment, and holistic development of students in light of NEP 2020. Nevertheless, it can be adjusted to undergraduate courses after research on a few more parameters, bigger samples, more subjects, and programs.

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