

**AG-403**

**Petroleum Geology**

**Credit Hours 2+1**

**Prerequisite:** AG-303

### **Learning Outcomes**

This course is designed to acquire the knowledge about the processes involved in the formation, migration and accumulation of petroleum in the rocks and drilling and well logging techniques for petrophysical evaluation and production of oil and gas. This will help the students to learn about the global occurrences of oil and gas with special emphasis on Pakistan so that they can effectively use their knowledge in the exploration and development of the country's energy resources.

### **Course Contents**

The nature of petroleum hydrocarbons, their origin, migration and accumulation. Source sediments, reservoir rocks, and trapping mechanism for oil and gas. Prospecting and exploration of oil and gas. Basic concepts of exploration seismology; geochemical methods; drilling and well logging. Reservoir characteristics, drive mechanism, energy and pressure maintenance. Secondary and enhanced recovery. Recent advances in reservoir engineering. Petroleum basins and world distribution of oil and gas with emphasis on Pakistan and Middle-East.

### **Lab.**

Preparation of various kinds of subsurface maps, e.g., isopachs, isochore, isoliths etc. Preparation of fence diagrams. Visits to well / drilling sites.

### **TEACHING – LEARNING STRATEGIES**

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

### **ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR**

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

## ASSESSMENT AND EXAMINATIONS

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

### Books Recommended

1. Petroleum Geology by North, F.K., 1985, Allen & Unwin.
2. Geology of petroleum by leverson, A.I., 1970, W.H. Freeman & Co.
3. Geology and Tectonics of Pakistan by Kazmi, A.H. & jan, M.Q., 1997, Graphic Publishers.
4. Geology of Pakistan by Bender, F.K. & Raza, H.A., (eds.) 1995, Gebruder Borntraeger.
5. Hydrocarbons from Coal by Law B.E., & Rice, D.D., 1993, AAPG studies in Geology # 38.
6. Principles of petroleum Development Geology by London, R.C., 1996, Prentice Hall.