

Subject Code: 1ET4060404	Subject Title: Reservoir Engineering
Pre-Requisite	--

RATIONALE:

The students of petroleum engineering are mainly involved in survey of land for finding petroleum under the ground with various techniques. After finding the suitable land having worth amount of petroleum data will given to further drilling engineers for further process of drilling petroleum well. The actual petroleum production will start after drilling well and installation of the equipment for pumping the crude. It is important to know amount or petroleum in the reservoir and its quality because the overall cost of starting petroleum production will be very high.

This course has been introduced at Diploma level in order to develop the skills in student so that they can understand the various methods of finding the crude resources and its quantity under the ground with latest technologies.

COMPETENCY:

The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire the knowledge of petroleum reservoir.

COURSE OBJECTIVE:

1. Explain the basic concepts of reservoir media, fluid flow and its behavior
2. To provide the difference between single and multiphase flow for reservoir flow system
3. How to acquire and analyze the data of reservoir
4. To develop the reservoir performance evaluation

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment
2	-	2	3	60	40	20	30

DETAILS OF COURSE CONTENTS:

UNIT.	TOPIC	Total Hrs.	Weightage %
1	Introduction to reservoir media –porous and fracture medium, concept of porosity fluid saturation, wettability, capillary pressure and relative permeability for understanding multiphase flow behavior in reservoir system, Salient features of Gas-Oil and Water-Oil relative permeability Curves, Factors affecting relative permeability, Three phase relative permeability, basic laboratory core data analysis for understanding petrophysical parameters.	12	30

2	Fundamentals of flow in porous media, Classification of flow system in porous media, Single phase and multiphase fluid flow in different state (steady and unsteady) and different systems (linear, radial, turbulent, spherical) considering compressible, slightly compressible and incompressible fluid, Diffusivity equation and its application for reservoir flow system	10	25
3	Reservoir Field operation data acquisition, Basic data of reservoir engineering; PVT data, Core data, Well logging and transient well testing information. Reservoir Drive Mechanism, Application of reservoir engineering principles: volumetrics, material balance and decline curve analysis.	10	25
4	Reservoir Engineering activities and management, Reservoir performance analysis, Preparation of development schemes, IOR/EOR and workover jobs for reservoir management, Concept of Reservoir simulation	10	20

COURSE OUTCOME:

On completion of the course, student will be able to

- CO1 - Know the basics of fluid properties and petrophysical parameters of the petroleum reservoir system;
- CO2 - Assess the importance of various petrophysical parameters for flow behaviour of fluids in multiphase petroleum reservoir system;
- CO3 - Understand the different types of flow system existing in a petroleum system in terms of rock, fluid and drive system;
- CO4 - Analyse the importance of reservoir data acquisition activities in different stages of reservoir life;
- CO5 - Conceptualize sequential reservoir engineering activities;
- CO6 - Perform reservoir performance analysis in conjunction with reservoir management concepts

LIST OF REFERENCES:

Sr. No.	Title of Books	Author	Publication
01	Fundamentals of Reservoir Engineering	L. P. Dake	Elsevier, 17th Edition, 1998
02	Applied Petroleum Reservoir Engineering (Second Edition)	B. C. Craft and M. F. Hawkins Revised by Ronald E. Terry	Prentice Hall.
03	Worldwide Practical Petroleum Reservoir Engineering Methods	H. C. "Slip" Slider	Pennwell Publishing Company
04	Advance Reservoir Engineering	Tarek Ahmed and Paul D. McKinney	Gulf Professional Publishing- Elsevier - 2005
05	Applied Reservoir Engineering (Vol – I & II)–	C. R. Smith, G. W. Tracy, R. L. Farrar	OGCI Publications - 1992
06	Petroleum Reservoir Rock and Fluid Properties	Abhijit Y. Dandekar	Taylor and Francis- 2006