

## 6. Prodi Teknik Perminyakan (S-2, S-3)

### **TM8111 Aliran Fluida Dalam Media Berpori (Fluid Flow in Porous Media)**

*Short Description:*

Microscopic and macroscopic porous media description, porous media hydrostatic, Darcy Law and its solutions, mathematical and physical rules on fluid flow in porous media theory, mathematical model for single-phase, incompressible and compressible fluid flow in porous media, mathematical model for multiphase flow, displacement in homogenous porous media, miscible and immiscible fluid flow, instability phenomenon.

### **TM8112 Simulasi Reservoir (Reservoir Simulation)**

*Short Description:*

Mathematical model for fluid flow in reservoir, numerical formulation using continue and discrete approach, numerical formulation solving, programming structure, well modeling, solution methods, apparent relative permeability curve, 3-phase flow modeling, gridding techniques, special phenomena simulation, special model simulation.

### **TM8113 Kapita Selekt Reservoir (Special Topics in Reservoir Engineering)**

*Short Description:*

Reservoir fluids description for reservoir simulation, reservoir rock description for reservoir simulation, sandstone and carbonate reservoir sedimentation environment, sedimentation environment identification using log data, reservoir rock heterogeneity.

### **TM8214 Pendesakan Tak Tercampur (Immiscible Displacement)**

*Short Description:*

Microscopic and macroscopic aspects affecting immiscible displacement especially water flooding as an enhanced oil recovery (EOR) method, microscopic aspects including basic principle on reservoir fluid and reservoir rock interaction, fluid distribution in porous media, multiphase flow in porous media, macroscopic aspects including linear-multiphase displacement equations and displacement at 2-D systems.

### **TM8215 Pendesakan Tercampur (Miscible Flooding)**

*Short Description:*

Behavior of miscible fluids, factors affecting miscible displacement, miscible displacement process types, forecasting methods, field proven results.

### **TM8216 Pendesakan Kimia (Chemical Flooding)**

*Short Description:*

This is an advanced course that will be giving deeper understanding to graduate students of Petroleum Engineering to develop chemical displacement methods (polymer, alkaline and surfactant injection) to enhance oil recovery. Discussion will be including displacement mechanism, limitation, reservoir criteria, slug optimization and economical review.

**TM8217 Pendesakan Thermal (Thermal Recovery)**

*Short Description:*

This is an advanced engineering course that will be giving deeper understanding to graduate students of Petroleum Engineering to develop and review thermal displacement (in-situ combustion, steam injection and stimulation) on its status and potential. General principle regarding to heat transfer and its application in thermal displacement will be delivered.

**TM8118 Kapita Selekt Gas Bumi (Special Topics in Natural Gas Engineering)**

*Short Description:*

Natural gas engineering basic principles, important aspects on gas reservoir, production and processing and special topics on gas reservoir, production and processing.

**TM8119 Petrofisika Lanjut (Advanced Petrophysics)**

*Short Description:*

Reservoir rock properties, measurement of certain reservoir rock properties, lithology and diagenesa, pore structure and geometry, internal surface area, hydraulic flow unit concept, interfacial phenomena, wettability, resistivity, restoration, SCAL and reservoir damage mechanism.

**TM8241 Teknik Produksi Lanjut (Advanced Production Engineering)**

*Short Description:*

This is an advance on Production Engineering course given in undergraduate which will be emphasizing on NODAL system analysis while analyzing production well (natural and artificial lift). Flow behavior in NODAL components and artificial lift techniques will be discussed for providing knowledge on optimum production facilities planning.

**TM8142 Kapita Selekt Produksi (Special Topics in Production Engineering)**

*Short Description:*

Recent research, development and technology in production engineering especially on inflow component methods, fluid flow in pipe, artificial lift and reservoir fluid separation process. Technical papers from various source will be mainly referred.

**TM8243 Aliran Fluida Dua Fasa Dalam Pipa (Two-phase Flow in Pipe)**

*Short Description:*

Single phase and two-phase fluid flow in pipe phenomena, analytical, empirical and mechanistic flow model, and pressure loss estimation on two-phase flow in pipe, flow pattern development, and field applications.

**TM8244 Perancangan Pengolahan Lapangan (Surface Facilities and Transportation Design of Oil and Gas Field)**

*Short Description:*

Recent research, development and technology published in technical papers, oil and gas pipeline system design with economic analysis.

**TM8151 Manajemen dan Analisis Keekonomian Proyek Migas Lanjut (Advanced Management and Economic Analysis of Oil and Gas Projects)**

*Short Description:*

Studying, discussing and exercising on special cases in management and economic analysis of oil and gas projects and field development planning, oil and gas contract, non-economic fields, risk, cost and environmental management portfolio.

**TM8152 Kapita Selektta Ekonomi Migas (Selected Topics on Oil and Gas Economics)**

*Short Description:*

Most recent topics and cases on oil and gas economics will be discussed by using basic principles given at Oil and Gas Economics course (undergraduate)

**TM8253 Teknik Optimasi Lanjut (Optimization Techniques)**

*Short Description:*

Methods and techniques applied in developing optimization model (Linear Programming, Sensitivity Analysis, Duality, Decision Analysis, Allocation, Transportation, Network Analysis, Critical Path Method, Project Scheduling, Inventory, Queuing and Simulation), validity testing, model application on real operation.

**TM8254 Pengelolaan Energi, Sumber Daya Mineral dan Lingkungan (Energy, Mineral Resources and Environment Management)**

*Short Description:*

Economic and public policy on energy, mineral resources and environment management with naturally high-risk energy and mineral resources exploitation activities.

**TM8261 Teknik Reservoir Panas Bumi (Geothermal Reservoir Engineering)**

*Short Description:*

Fluid flow in porous media, integrated data analysis, reserve and electric potential estimation using various methods, reservoir performance forecasting using decline curve analysis, well output testing, pressure build-up testing, interference testing and reservoir simulation

**TM8162 Teknik Produksi Panas Bumi (Geothermal Production Engineering)**

*Short Description:*

Geothermal well system and surface production facilities, production curve, field measurement, fluid flow in geothermal field, pressure and heat loss estimation methods, well simulation, scaling and corrosion problem, material selection and production performance monitoring.

**TM8163 Utilisasi Energi Panas Bumi (Geothermal Energy Utilization)**

*Short Description:*

Geothermal energy utilization for electric and non-electric use (geothermal electric plant, room cooling system, product drying system, soil heating), basic principle, utilized technology, electric power and steam requirement for electric plant for various energy conversion cycle, exergy analysis, air cooling, cooling tower design and gas extraction system.

**TM8264 Simulasi Reservoir Panas Bumi (Geothermal Reservoir Simulation)**

*Short Description:*

Basic principle and methodology of reservoir simulation, conceptual model development, computer model development, data analysis, data preparation for reservoir simulation, simulation procedure, history matching, performance forecasting and model development using TOUGH2 simulator.

**TM8121 Analisis Tekanan Transien (Pressure Transient Analysis)**

*Short Description:*

Fundamental concepts and development path of standard well testing methods discovery, limitation and development possibilities and new methods for more complicated field cases and EOR application.

**TM8122 Kapita Selekt Formasi (Selected Topics on Formation Evaluation)**

*Short Description:*

Recent research, development and technology in formation evaluation.

**TM8123 Interpretasi Log (Log Interpretation)**

*Short Description:*

This course emphasize the quantitative approach on formation evaluation with wireline well logging. After log acquisition and qualitative surveying have been acquired quantitative analysis for several cases must be conducted.

**TM8224 Peralatan dan Kontrol Logging (Logging Tools and Quality Control)**

*Short Description:*

Wireline well logging working principle, design and operational procedure.

**TM8131 Teknik Pemboran Lanjut (Advanced Drilling Engineering)**

*Short Description:*

Drilling site preparation, rock mechanics, vertical well drillstring design, drilling mud, cement theory and cementing job, drilling fluid hydraulics, abnormal pressure origin, formation pressure detection techniques, wellkick and pressure control, directional drilling, BHA, casing design and horizontal drilling.

### **Mekanika Batuan (Rock Mechanics)**

*Short Description:*

Basic principle of rock mechanics, linear elasticity, rock strength, consolidation theory, linear poroelasticity theory, effective stress, state of stress underground, coupled geomechanic/fluid flow and coupled geomechanic/fluid flow application on stress-sensitive reservoir drilling.

### **TM8233 Teknik Pemboran Lepas Pantai (Offshore Drilling Engineering)**

*Short Description:*

Oceanography, basic offshore construction, offshore platform, offshore construction operation, drilling operation at fixed platform, drilling operation at jack-up rig, drilling operation at floating system, position maintenance and surface movement composition, vessel inspection and maintenance.

### **TM8101 Matematika Teknik Perminyakan Lanjut (Advanced Petroleum Engineering Mathematics)**

*Short Description:*

Advanced engineering science providing deeper understanding for graduate student to develop mathematical models on petroleum and geothermal engineering appliance and providing knowledge to solve mathematical modeling problems using most recent engineering mathematics techniques.

### **TM8202 Fenomena Perpindahan Panas dan Materi (Heat and Mass Transfer Phenomena)**

*Short Description:*

Short review on general heat and mass transfer phenomena, analytic and numeric calculation techniques, heat and mass transfer process in oil and gas production operation (in pipes, surface facilities, wellbores and reservoir)

### **TM72Z2 Tesis (Thesis)**

*Short Description:*

Conducting research under supervision of one or more advisor about basic aspect in oil, gas and geothermal exploitation activities and will be technically written and delivered on defense final test.

### **TM91Z4 Disertasi IA (Dissertation IA)**

*Short Description:*

Preliminary sequence of original research on petroleum engineering at doctoral level which never been conducted before by anyone else. The result will be technically written as a dissertation.

### **TM91Z4 Disertasi IB (Dissertation IB)**

*Short Description:*

Advanced sequence of original research on petroleum engineering at doctoral level which never been conducted before by anyone else. The result will be technically written as a dissertation.

**TM91Z4 Disertasi IIA (Dissertation IIA)**

*Short Description:*

Advanced sequence of original research on petroleum engineering at doctoral level which never been conducted before by anyone else. The result will be technically written as a dissertation.

**TM91Z4 Disertasi IA (Dissertation IA)**

*Short Description:*

Advanced sequence of original research on petroleum engineering at doctoral level which never been conducted before by anyone else. The result will be technically written as a dissertation.