

## 西安石油大学石油工程学院课程简介

### 石油工程系：油气田开发工程教研室

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## Introduction to Petroleum Industry

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This course is compulsory for all school students. The course introduces the basic concepts, theories, techniques and method of the oil industry's upstream (oil exploration and development), midstream (gathering, storage and transportation of oil and gas) and downstream (oil refining and oil chemical). The course also introduces the history of the oil industry, energy status and development trends.

2007

## petrophysics

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This course is a general class for petroleum engineering students, and it has a strong property to practice students' ability which is especially important for this major. This course intends to

introduce the physical properties of reservoir rock, the physical properties of reservoir fluid and the character of fluid flowing through porous media. It is the basic of the fluid flowing through porous media, reservoir engineering as well as enhanced oil recovery.

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#### Foundation of Oilfield Geology

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2 5

This course is a specialized core course for petroleum engineering undergraduate students. In this course, general geology about oil & gas development, basic knowledge, basic principle and basic methods of structural geology are particularly introduced. It also discusses the content of hydrocarbon generation, hydrocarbon migration, hydrocarbon trap, hydrocarbon accumulation, hydrocarbon occurrence and hydrocarbon conservation. By studying this course, the student can make a good foundation for the sequent study which is related to geology and other special lessons.

## Gas Production Engineering

36 2

The course introduces the basic theory and knowledge of gas production system, such as physical parameter calculating of natural gas, well testing, system analysis, reservoir stimulation, production techniques and gas purification and so on. At the same time the course summarizes the new technique of Gas Production Engineering.

- [ 1] 2000 9
- [ 2] 2005
- [ 3]
- [ 4]

## I

## Petroleum Production Engineering I

54 3

Petroleum Production Engineering is an important course for the petroleum engineering undergraduate students. The course introduces the basic theory and knowledge of petroleum production system, emphatically introduces oil well inflow performance the principle and design method of petroleum production and reservoir stimulation. At the same time the course summarizes the advancement of petroleum production engineering.

The purpose of the course is to make students master the basic knowledge and principle of petroleum production engineering and its application in oil field, and to foster the scientific thinking methods and abilities to analyze and solve problems for the students. So through the study of the course, students can learn consolidated knowledge and face challenges in society.

2000 3

#### New Technique of Petroleum Production Engineering

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1.5

New Technique of Petroleum Production Engineering is an optional course for students of the petroleum engineering. It includes the adaptability, choosing of production technology, analysis of geology model, development design, perforating and testing, logging, and lift technology for horizontal wells.

[ 1]

1998

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2006 8

## Reservoir Modeling

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1.5

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Basic rule and knowledge of oil (gas) reservoir modeling are introduced systemically according to the characteristics of the petroleum engineering. In this course, the classifications of the reservoir geological models based on different classifying methods are introduced. The conceptual geological models and the certainty geological models and the stochastic prediction models are introduced. The new technologies of the stochastic prediction in special reservoir are introduced and the main software of the reservoir modeling is also introduced in this course.

- [ 1] 1999
- [ 2] 2000
- [ 3] 2001
- [ 4] 1996
- [ 5] 1999
- [ 6] 1998

## Heat and Mass Transfer

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The main content of the course includes the fundamental theory, principle and engineering application problems of Heat and Mass Transfer, some advanced technologies and the trend of the course are also introduced, in detail, the course comprises heat conduction, convection heat transfer, radiation heat transfer, the process of heat transfer, heat exchanger and its engineering application and the foundation of mass transfer process.

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## I

### Engineering Fluid Mechanics

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The main content of the course includes the property, statics, dynamics of the flow and the foundation of the non-Newtonian fluid flow. The state of flow can be divided into linear and turbulent flow in the dynamic part, the corresponding flow characteristics and analysis method are also presented simply, similarity theory is also introduced. The hydraulic calculation of flow resistance, water head loss and pressure pipe are recommended in detail according to the realistic need of petroleum engineering.

1986 12

## Percolation Flow Through Porous Media Mechanics

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“Percolation Flow Mechanics Through Porous Media ” is main fundamental professional course of oil-field development and production professiond specialties. Its task makes the students grasp the movement rule of the formation fluid under the water drive, the elastic drive and the dissolved gas drive, productivity computation and formation parameter definition through the transient well test. In the light of formation character, fluid nature and geological condition, the students choose the reasonable mathematical model, research fluid motion rule and carry on the performance forecast to prepare after their graduation, which prepare specialized theory knowledge for solving actual problems in oil-field development process and scientific research work .

2001

Petroleum Well Logging

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The course introduces the basic theory and knowledge of petroleum well logging, emphatically introduces the principle and application of some well logging modes such as electric method acoustic wave and radioactivity. Its comprehensive practicality value in oil and gas field and the application of new methods introduced from overseas can be especially taken note of in this course. By studying this course, the students should master how to tackle with the problems of oil field development and production geology and project, which can provide a good foundation for oil field exploratory development and scientific research.

2006

The Principle of Enhanced Oil Recovery

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In the field of petroleum engineering, The Principle of Enhanced Oil Recovery is an important professional course. The application of kinds of ways to enhance oil recovery in oil field has been introduced in the course; in addition, the basic principles and knowledge of the course have been elaborated systematically.

The purpose of the course is to make students master the basic knowledge and principle of EOR and its application in oil field, foster the students right scientific thinking method and abilities to analyze and solve problems. So through the study of the course, students can learn consolidated knowledge and face challenges in society.

#### Theory and Method of Modern Well Test

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The task of this course is to make students master basic principle, fundamental knowledge and how to solve equations for typical well test interpretation model. The abilities of collecting data, interpreting model, analyzing data, evaluating effectiveness and practicing field can be freely applied to oil & gas field development for learners. Further they can assess and monitor oil and gas performance and understand new technology and development direction of well test.

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## I II

### Reservoir Engineering I II

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This curriculum systematically explains the concept and fundamental research method of oil reservoir engineering revolving conventional reservoir engineering design, computation, forecast analysis and so on in oil-field development process. The concrete content includes: oil-field exploitation design foundation, oil reservoir matter balance method, oil gas well production performance analysis, well testing principle and method of oil gas wells, oil-field development dynamic analysis and recovery computation, economic evaluation oil-field development technology.

- [ 1] 2001
- [ 2] 2002
- [ 3] 1998
- [ 4] 2004

- [ 1]
- [ 2]
- [ 3]
- [ 4]

### Foundation of Oilfield Development Geology

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This course is a specialized core course for petroleum engineering undergraduate students. In this course, general geology about oil & gas development, basic knowledge, basic principle and basic methods of structural geology are particularly introduced. It also discusses the content of hydrocarbon generation, hydrocarbon migration, hydrocarbon trap, hydrocarbon accumulation, hydrocarbon occurrence and hydrocarbon conservation. Some basic methods, which are related to data collection, arrangement and analysis during the process of oil & gas field development, are introduced. It also introduces the programming and application of geologic map, the analytical method for inhomogeneous characters of formation, the internal relations of static geologic characteristic of reservoir and dynamical characteristic of oil field development, also, the main geologic factors which affect oil-producing, water-producing and distribution of residual oil in reservoirs of waterflooding development. By studying this course, the students can know how to use the theory of geology to analyze and resolve the problems during the field development, thus to serve for the exploration and development of the oil field.

- |      |      |
|------|------|
| [ 1] | 2006 |
| [ 2] | 1999 |

This course is a specialized core course for petroleum engineering undergraduate students. In this course, some basic methods, which are related to data collection, arrangement and analysis during the process of oil & gas field development, are introduced. It also introduces the programming and application of geologic map, the analytical method for inhomogeneous characters of formation, the internal relations of static geologic characteristic of reservoir and dynamical characteristic of oil field development, also, the main geologic factors which affect oil-producing, water-producing and distribution of residual oil in reservoirs of waterflooding development. By studying this course, the students can know how to use the theory of geology to analyze and resolve the problems during the field development, thus to serve for the exploration and development of the oil field.

1999

#### Oil & Gas Production DataBase and Its Application

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Windows

SQL

The main task of this course is to introduce the management, and general knowledge of how to use the database, including data model, database structure, database systems, database design,

and relation operation, relation standardization, and relation seek (SQL language) and other areas; it focus on the introduction of the organization and the use of a typical oil field production database management system.

Access

2006 7

### Project Design of Petroleum Production Engineering

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1.5

Project Design of Petroleum Production Engineering is a specialty course of the petroleum engineering. The course introduces the basic theory and knowledge of the design process of petroleum production engineering as well as the technique of project design and production technology. The new technique, technology and development of petroleum production engineering are also introduced. It is very important to study for solving the practical problem in engineering or engaging in science study in the future.

2002 9

- [ 1] SY/T6081- 94 1996
- [ 2] , 2000 9
- [ 3] , 1995
- [ 4] , 2000



### Multiphase Flow in Wellbore

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1.5

Multiphase flow in Wellbore covers the basic characteristics and technologies of gas-liquid mixture flowing in vertical, slant, and horizontal conduits. Mixture properties, flow theory and principle, pressure gradients, methods and correlations are addressed in detail in the course. After attending this course, students will be able to identify, analyze and solve multiphase flow problems.

1989

Dale Beggs    Production Optimization    OGCI Publishions    1991

### Case Study of Production Engineering

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1.5

By illustrating the procedures, methods, correlations, software, and experiences used by field production engineers, the course shows students how to apply the knowledge from previous courses to actual wells. Four typical cases from fields, gas well production, artificial lift, hydraulic fracturing, and acidizing, covering the major areas of production engineering are carefully selected to transfer field works to college students. All aspects of the planning, designing, and implementation of the four cases are addressed.

- [ 1] 2006  
[ 2] Economides M.J Nolte K.G Reservoir Stimulation John Wiley & Sons  
2000 Third Edition

#### Reservoir Stimulation

28

1. 5

Reservoir Stimulation lectures the technologies of hydraulic fracturing and acidizing. Other technologies of high energy gas explosion, electrical impulses, ultrasonics, micro seism, hydraulic pulsing and oscillation, are also addressed. New developments at various stages of development and application are also covered in the course. Students will learn the principles, correlations,

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methods, and procedures of those reservoir stimulation methods in production and injection wells, and will become familiar with both past proven and newer technologies, procedures, and techniques to improve and increase oil, gas, and condensate production.

- [ 1] 2006
- [ 2] Economides M.J. Nolte K.G. Reservoir Stimulation John Wiley & Sons  
2000 Third Edition

#### Offshore Petroleum Production Engineering

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1. 5

Offshore Petroleum Production Engineering is one of the important subjects of petroleum engineering in offshore petroleum subject direction. This course introduces basic theoretical knowledge of offshore oil well production system which covers the following topics: offshore oil production equipment, offshore gas and water treatment system and offshore oil production technology characteristics. This course also explains the oil production method selection and technology design methods that are adapted to offshore oil production.

By learning the course, students can radically be familiar with offshore oil production equipment and master offshore oil production technology characteristics, and make the professional theory basis for their future offshore oil producing operation and research work.

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[2]			1990
[3]	S. R		1988
[4]		1993	10

#### Reservoir Numerical Simulation

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This curriculum systematically introduces the elementary theory and the method in reservoir numerical simulation, emphatically explains the mentality and the process of the mathematical model evolving to the numerical model, and simultaneously strengthens students the fundamental training of numerical simulation practical work..

[1]			1998
[2]			2004
[1]			
[2]			

#### Oil & Gas Reservoir Performances Monitoring

28    1.5    4

The course “Oil & Gas Reservoir Performances Monitoring” introduces the basic principles and methods of oil & gas reservoir performances monitoring techniques, such as reservoir logging evaluation techniques, interwell monitoring techniques, production testing techniques, permanent testing techniques and so on..

- [1] 1994
- [2] 2006
- [3] 2008
- [1] [J] 2008 22(3)
- [2] [J] ( ) 2008 38(5)
- [3] [J] 2002(9)
- [4] RT [J] 2008 32(2)
- [5] [J] 2003 27(2)
- [6]  $E_s^1$  [J] ( ) 2007 29(2)
- [7] [J] 2004 28(S0)
- [8] [J] 2003 26(1)
- [9] [J] 2003 26(5-6)
- [10] : ( ) [J] 2004 25(1)
- [11] [J] 2007 14(3)
- [12] DSC [J] 2007 31(5)
- [13] [J] 2005 20(3)
- [14] [J] 2005 24(6)
- [15] [J]

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	2000	24(5)		
[ 16]			[J]	2002 9(3)
[ 17]			[J]	2008 30(6)
[ 18]				[J]
	(	)	2006	28(4)
[ 19]			[J]	2008 22(6)
[ 20]				[J]
	2008	5(6)		

#### Productive testing of oil-gas well

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1.5

Productive testing of oil-gas well is a professional elective subject of petroleum engineering. It should be set up after the student have learned the professional course mainly. The mission is to introduces oil reservoir dynamic parameter, the principle of appearance and equipment, test technique and basic data processing method in petroleum exploration and producing process.

Basic knowledge of measuring the instrument appearance; the measure of pressure; the measure of discharge and temperature and position of liquid face; the common test technology; the Wireline Formation test technique; the Drill Stem test technique will be teached in this course.

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## HSE

HSE risk management for petroleum Engineering

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1.5

HSE

HSE

HSE

The course introduces the basic theory and knowledge of HSE risk management for petroleum engineering, such as the importance of HSE risk management in petroleum engineering production, varieties of distinguishing and controlling methods, first-aid theme; at the same time the course summarizes the development process of HSE risk management for petroleum Engineering.

HSE

2008 11

HSE

design of oil field development program

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1.5

The course introduces the basic theory and knowledge of the design process of new oil field development plan, mainly focuses on development approach, well system, relations between injection and production, pressure system and development effect prediction; is to understand the development program involved the design of the reservoir characterization, drilling engineering, reservoir engineering, ground engineering design and economic evaluation aspects.

- [ 1] 2002
- [ 2] 1991
- [ 3] 1989
- [ 4] 1994
- [ 5] 1996

#### Reservoir Management

28

1. 5

2

The course firstly gives us an overview of reservoir management and then clearly introduces



its human resource management, reservoir technology management and cooperation model, information management model, exploitation process monitor and evaluation model, optimization decision model, economic evaluation model, as well as information integration computer application system design.

[ 1]	2001	
[ 2]	2003	
[ 3]		2006
[ 4]	2007	

#### Oil Reservoir Evaluation Technique

28

1. 5

The course that places stress on the combination between macroscope and microscope, quiescency and performance, introduces the evaluation technique of oil reservoir during development phase systematically from qualitative analysis to quantitative characterization. Basic methods of oil reservoir evaluation, preparation of fundamental data, main content, procedure and classification criteria of parameters will be mastered, at the same time, development orientation of evaluation technique also will be made definitely, which can provide a good foundation for oilfield development and scientific research.

[ 1]	2006	5
[ 2]	2005	9
[ 3]	1997	12

[4]	1996	11
[5]	2006	12

#### Oil-Gas Development New Technologies

28	1.5
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This is a petroleum engineering course to expand knowledge, involving a wider scope. Its task is to explain all aspects of new technologies to enable students to master a new field of petroleum engineering theory and the progress of new technologies for future study and work to lay a good foundation.

### III

#### Petroleum Production Engineering III

36	2
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Petroleum Production Engineering is an important course for the petroleum engineering undergraduate students. The course introduces the basic theory and knowledge of petroleum production system, emphatically introduces oil well inflow performance the principle and design method of petroleum production and reservoir stimulation. At the same time the course summarizes the advancement of petroleum production engineering.

The purpose of the course is to make students master the basic knowledge and principle of petroleum production engineering and its application in oil field, and to foster the scientific thinking methods and abilities to analyze and solve problems for the students. So through the study of the course, students can learn consolidated knowledge and face challenges in society.

2000 3

### III

#### Reservoir Engineering

36

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This curriculum systematically explains the concept and fundamental research method of oil reservoir engineering revolving conventional reservoir engineering design, computation, forecast analysis and so on in oil-field development process. The concrete content includes: oil-field exploitation design foundation, oil reservoir matter balance method, oil gas well production performance analysis, oil gas well testing principle and method, oil-field

development dynamic analysis and recovery computation, oil-field development technology economic evaluation.

- [ 1] 2001
- [ 2] 2002
- [ 3] 1998
- [ 4] 2004

- [ 1]
- [ 2]
- [ 3]
- [ 4]

#### Introduction to Petroleum Engineering

108

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This course is a elective course for the students of english major. The course introduces the primary concepts, theory and processes about the induction of oil and gas. So through the study of the course, students can learn consolidated knowledge and face challenges in society.

- [ 1] 2001
- [ 2] 2000
- [ 3] 2000

- [ 1]
- [ 2]
- [ 3]

## I

## Drilling Engineering

64

3.5

The Drilling Engineering course will introduce O&G well drilling fundamental knowledge and modern drilling technologies. The major contents are as follows: (1) O&G well drilling engineering and geologic knowledge; (2) formation stresses distribution; (3) wellbore pressure system; (4) major drilling technology; (5) conventional downhole drill tools; (6) all the technical mechanism, theories, engineering calculations in drilling fluids, drilling parameters optimization, drilling hydraulics, drilling wellbore track control, well control and the casing & cementing technologies; (7) Advanced and frontier technologies in drilling. Also there are some systematic training courses including classroom teaching, experiments, exercises tuition, well design project and field well drilling practice, all of these are designated for students to grasp well drilling theories and its engineering application.

[ 1]

2010

[ 2]

2006

[ 3] Applied Drilling Engineering Adam T. Bourgoyne etc.

[ 4] A Prime of Oilwell Drilling 5th Edition(Revised)

[ 5] The Rotary Rig and its Components 4th Edition

## Computation Method

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Chapter One Exordium

Chapter Two Numerical Method of Linear Algebra System of Equations

Chapter Three Approximate Solution of Equations

Chapter Four Interpolation and Data Fitting

Chapter Five Numerical Integration and Numerical Differentiation

Chapter Six Numerical Method of Ordinary Differential Equation Initial Value Problem

Chapter Seven Calculation of Matrix Eigenvalue and Eigenvector.

2004

## Petroleum Engineering English

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3

MWD/LWD

EOR

This course textbook includes 3 Parts contents. Part A , Petroleum Engineering Fundamentals, It mainly refers to Geology of Petroleum, Exploration, Well Drilling & Completion and Oil Production. Part B, Advanced Technology in Petroleum Engineering, it includes Directional Drilling, Horizontal/ Multilateral and Multibranch Wells in Petroleum Production Engineering, Multilateral Technology, MWD/LWD and Geosteering, Artificial-Lift Completions, Sand Stabilization and Exclusion, Conventional Well Stimulation and Water Control. And the part C was designated as Extensive Reading Material in Petroleum Engineering. Part C includes Drilling Fluids, Well Cementing, Underbalanced Drilling and Managed Pressure Drilling, Expandable Tubular Technology, Drilling with Casing (DWC), Intelligent Well Completions, CT Technology, EOR Technology and Well Testing. Part C was designated for students self-study or portion of them can be selected for speciality training module teaching. This course aims at enhancing students English application ability in petroleum engineering, such as in English article reading, international interchange, and international cooperation.

- [ 1] A Primer of Petroleum Engineering English  
2009
- [ 2] English for Petroleum Engineering 2006
- [ 3] Petroleum English 1993
- [ 4] Applied Drilling Engineering Adam T. Bourgoyne etc.
- [ 5] A Primer of Oilwell Drilling 5th Edition(Revised)
- [ 6] The Rotary Rig and its Components 4th Edition
- [ 7] Production Operations, Well completion, Workover and Stimulation , Thomas O.Allen  
and Alan P.Roberts
- [ 8] SPE

### Drilling Instrument

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1.5

Drilling Instrument is a practical stronger course for petroleum engineering specialty students, which is following Drilling Engineering; mainly introduced equipment and devices which could undertake induction, measurement, transmission or adjustment through the drilling process. Main content include: Basic knowledge of drilling instrument, non-electro testing of non electrical quantity technology, electro testing of non electrical quantity technology, drilling engineering information acquisition, field application of drilling information, simple introduction of remote transmission and advanced treatment. The curriculum will also introduce some latest technology related to measure while drilling and information application while drilling.

### Mechanics of Well Drilling Engineering

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1.5



The course introduces the basic mechanics theory and knowledge of drilling engineering, such as drilling pipe, casing and tubing, riser. And study how to design mathematical model on engineering drill string / casing string / tubular string in drilling and production, and all the fundamental calculation in string design. Then let students understand and grasp engineering problems solution method.

- [ 1] 1998
- [ 2] 1994
- [ 3] TH.HILL, DS-1Drilling String Standard
- [ 4] IADC Drilling Manual
- [ 5]

#### Well Completion Engineering

28

1. 5

Well completion engineering includes completion methods, completion method selection, wellhead & its installation, completion pipe string, and measures for committing to production. It

stresses on well completion methods selection. Well casing & cementing include casing design for special requirements, various cementing methods, and applied field processes. It stresses on reservoir damage prevention in pay zone drilling and well cementing. And also it introduces all the measures in insuring the late successful completion engineering engaged, such as hydraulic fracturing, acidizing, etc, and production pipe string design.

2006 9

#### Fundamentals of Rock Mechanics

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1. 5

The course is an applied rock mechanics in petroleum engineering. It introduces the basic theory and knowledge of rock mechanics, such as factors which will affect its mechanic properties. And its application in drilling rock breaking, openhole wellbore stabilization, hydraulic fracturing, formation sand exclusion, etc. And understand rock mechanics research method and its development.

2006

- [ 1] 1994  
[ 2] Erling Fjaer etl. Petroleum related rock mechanics Elsevier 1991

## Applied Oilfield Chemistry Fundamentals

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This is a course with very strong applicability, which solves various issues in oil/gas field development production and downhole operation by chemical method. The course is for the students to understand some basic concepts, theory in oil chemistry, and mechanism, evaluation method of various oilfield chemical reagents through combining oil/gas production operation and oilfield chemistry research feature. Students should priority master some basic concepts and theories in interface and colloid chemistry. Also, the structure, performance, purpose and methods for analyzing and evaluating of the surfactant and polymer should be understood. Besides, students should master the characteristics, mechanism, testing methods and application effectiveness analysis of various chemical agents in oil drilling, completion, acidizing, fracturing, water shutoff, profile modification, sand proof, wax removing, paraffin, oil recovery, crude oil dehydration and crude oil drag reduction-viscosity reduction, oil sewage treatment and other process.

[ 1]

2006

[ 2]

2000

[ 3]

1995

### Advanced Well Drilling Technology

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1.5

This curriculum mainly introduces the development status & trends, the key techniques and the application requirements of new techniques, new process and new apparatus for oil & gas well drilling in domestic and foreign. It mostly includes the technology of the horizontal well drilling, the extended-reach well drilling, the multi-lateral well drilling, the steering drilling, the slim hole drilling, the low pressure underbalance drilling, the casing drilling, the measurement while drilling and the drilling information est. Also this curriculum introduces the application of some new knowledge, new material and new technology of the inter-disciplines on drilling engineering.

### Technology for the Prevention of Petroleum Formation from Damage

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1.5

The course introduces the reservoir sensitivity mineralogical analysis method, reservoir potential damage factors, reservoir damage mechanism, the evaluation method in laboratory and field; the causes and types of reservoir damage in drilling, completion and oil/gas production process, and the measures for protecting reservoir. It provides necessary basic knowledge of protecting reservoir practice and scientific research for the students engaging in fields drilling, oil/gas production in future.

- [ 1] 2003  
 [ 2] 1993  
 [ 3] . 2003

#### Drilling fluids technology

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This course is a special course of petroleum engineering in college. The content of this course includes component, preparing and maintenance of drilling fluid, the base principle of drilling fluid technology, and the treatment method for engineering problem. This course also introduces the advanced theory and technology of drilling fluid, and provides international drilling fluid engineering cases. Through this course, the students can grasp drilling fluid theory and technique, and get a base engaging on drilling fluid engineering in oil field.

[ 1]

2001

[ 2]

drilling fluids technology

**Workover Engineering**

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1.5

This course is a complementary curriculum of petroleum engineering. Its task is to make the students to fundamentally master the oil-water wells workover techniques, on-site workover construction process, and understand the development of new technology about workover. Let students understand the field work situation, and increase perceptual knowledge of production site, lay a good foundation for the future professional work and scientific research.

**Intensive Petroleum Engineering English**

72

4

## MWD/LWD

## EOR

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- [ 1] A Primer of Petroleum Engineering English  
2009
- [ 2] Petroleum Well Construction, Hazim Abass, etc. Halliburton Company, 1997
- [ 3] Petroleum production Engineering, Boyun Guo, William C. Lyons, Ali Ghalambor,  
Elsevier Science & Technology Books, 2007
- [ 4] Applied Drilling Engineering, Adam T. Bourgoyne. 1986
- [ 5] A Primer of Oilwell Drilling, 5th Edition (Revised)

- [ 6] The Rotary Rig and its Components, 4th Edition
- [ 7] Production Operations, Well completion, Workover and Stimulation, Thomas O.Allen  
and Alan P.Roberts
- [ 8] SPE

### III

#### Drilling Engineering III

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### III

The Drilling Engineering course will introduce O&G well drilling fundamental knowledge and modern drilling technologies. The major contents are as follows: (1) O&G well drilling engineering and geologic knowledge; (2) formation stresses distribution; (3) wellbore pressure system; (4) major drilling technology; (5) conventional downhole drill tools; (6) all the technical mechanism, theories, engineering calculations in drilling fluids, drilling parameters optimization, drilling hydraulics, drilling wellbore track control, well control and the casing & cementing technologies; (7) Advanced and frontier technologies in drilling. Also there are some systematic training courses including classroom teaching, experiments, exercises tuition, all of these are designated for students to grasp well drilling theories and its engineering application.

[ 1]

2010

[ 2]

2006



- 
- [3] Applied Drilling Engineering Adam T. Bourgoyne etc.
  - [4] A Prime of Oilwell Drilling 5th Edition(Revised)
  - [5] The Rotary Rig and its Components 4th Edition

/SPE textbooks

### Engineering Thermodynamics

36 2

For study next courses and technique work better,the thermodynamics base concepts,ideal gas properties,ideal gas heat power process.The laws of thermodynamics and heat power cycle will be studied in this course.

2007 6 4

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## II

### Engineering Fluid Mechanics II

72 4 10



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pump and compressor, especially the centrifugal pump and compound-compressor. While, other kind of pump are only needed to know.

The course focuses on both its theoretical and scientific and science, and the necessary of pump and compressor in the course of oil and gas storage and transportation. In arranging the content, the course applies to the principles of concentrating emphasis, putting theory into practice. By making experiments while learning, the students are able to combine the material with theory, thus have a good command of the knowledge. And that is a good base for future study.

2008 1

#### Corrosion and Anticorrosion

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This is a foundation course for the major of Storage and Transportation of Oil and Gas. With the combination of specialty of the major, it generally introduces the theory of metal corrosion and various methods for detecting and protection, and puts stress on the applications of protection and service regulation of gathering system, underground pipeline and metal oil tank.

2009 8

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This course is an important theory for petroleum storage major students to learn the knowledge of oil products. It mainly elaborates the character of oil made in our country and the nature ,composing, quality index, these various oil products and some main elements that affect to them .Also, it introduces and analyses the easy-changed nature of them that is stored. On the other hand, it discusses some questions, such as, how to sustain the quality of them, when it is in storage management and how to deal with the unqualified products.

This course's content not only focuses on its systematic. scientific and advanced, but also considers the need of oil products in transportation and storage Engineering Science. It scattered difficulty, adapts from simple to complex and makes a steady progress in its content arrangement. With these principles, the students could know knowledge of oil products comprehensively, and meanwhile, they could have a steady base to engage in the practice of production and do science research.

2006

## II

Collection & Transportation for oil-gas II

64

3. 5

The course introduces study object, contents and construction features. Tasks, oilfield products and the quality index, oil-gas gathering and transportation flow process, properties of oil-gas and basic theory for oil-gas gathering and transportation systems in a more comprehensive manner. Focus on process, design principles and calculation methods on gas-liquid separation, field gathering and transfer pipelines, dehydration and purification of crude oil, crude oil stabilization, gas purification of dehydration and sour gas, light hydrocarbon recovery and wasted-water process. Development and exploitation of oil fields are also briefly introduced.

2006 5

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#### Strength Design of the Oil Tank and Pipeline

64

3.5

According to the characteristic of petroleum and gas storage and transportation engineering, the main principles are briefly introduced. The design and strength calculation of vertical tank and underground pipeline are mainly studied.

2006

## English in Oil &amp; Gas Storage and Transportation

90

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This is an important engineering course from Basic English study to special English reading for oil & gas storage and transportation engineering students, which is a limited elective course. In this course, contents of Oil & Gas Storage and Transportation, various long distance transportation pipelines, fuel depot, construction and corrosion protection are generally introduced. By studying, students in this major should master the technical words phrases for oil & gas storage and transportation engineering, and also grasp the grammar and basic knowledge for special English.

1996 8

## Design and Management for oil Depot

64

3.5

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This is an important major course of Storage and Transportation of Oil and Gas. With the combination of specialty of the major, it expatiates on design, construction, management and safety of petroleum storage depots, and puts stress on the applications in engineering practice of surface distribution oil depot, loading and unloading operation for oil, evaporation dissipation of oil and safety of depot.

2006

Design & Management for Oil Transportation Pipeline

64

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This major course is an important course for oil storage and transportation major Students. It mainly includes the overview situation and reconnaissance of pipeline, the is othermal and hot lil popeline. The calculation of succession, hydraulic, heat power pipeline. And the transportation of wary crude oil and easy solidification oil.

2010

Design and Management for Gas Transmission Pipeline



54

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This course is an important specialized-oriented course for oil storage and transportation major students. It mainly includes the physical and chemical nature of natural gas, the calculation about hydraulic power and heat power of gas transportation, the design and analysis of the project's condition, the gas transportation station, gas storage at the end of pipe. It emphatically reflects the art development condition of nature gas pipeline transportation in our country, and focus on the basic theory and actual practice of project.

Its content not only focuses on its systematic, scientific, and advanced but also considers the need of design and management for gas transmission pipeline for oil transportation and storage engineering science. It scatters difficulty, adapts from simple to complex and makes a steady progress in its content arrangement , with these principles , the students could master the design and art for gas transmission pipeline , meanwhile , they could have the steady base to engage in the practice of production and do science research .

2008 9

21

Rheology

36

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The course is a major curriculum for students of oil and gas storage and transportation, which is highly practical. It resumptively recounts not only the basic knowledge of rheology and the principium but technique of measuring the rheology of materiel. It focuses on the rheology of crude oil under external force and the methods of evaluating and measuring method.

2007 2

#### Safety Technique in Storage & Transportation of Oil & Gas

36

2

#### HSE

This is an important electiveloptional course for the major of Storage and Transportation of Oil and Gas. With the combination of specialty of the major, it generally introduces the Chinese basic policy of safety in production, puts stress on HSE(health, safety and environment) management system, and introduces the risk of fire and explosion when storing or transporting the oil and gas. gathering and storage of crude oil. safety production of natural gas and lighter hydrocarbon. safety in long-distance oil and gas pipeline transportation. common pressure vessel in the field. fire prevention and control technique of storing and transporting oil and gas, etc.

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2003

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2004

### New Technology in Oil-Gas Storage & Transportation Engineering

36

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This course is an elective course for students majored in oil-gas storage & transportation engineering. It introduces the current technical status and all aspects of new theories, technologies and equipments of oil-gas gathering and transportation engineering and fuel storage.

### Measure Technique for Oil & Natural Gas

36

2

The course introduced the application of mass measure technique volume measure technique density measure technique pressure measure technique flow rate measure technique. temperature measure technique and level measure technique. Metering loss analysis are also introduced.

- [ 1] 1992  
[ 2] 2006

#### Construction of Oil-Gas Storage & Transportation Facilities

36 2

This is a elective course for the major of Oil-Gas Storage & Transportation Engineering. With the combination of specialty of the major and the practical situation of our country, it expatiates on construction and management of tank and pipeline, and puts stress on assembly. equipments installation and welding techniques for tank and pipeline, quality inspection and test of tank. Examination. urgent repairing. working safety and organization of pipeline.

2007

Fuel Gas Transmission and Distribution in City

36

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The course is an important special-oriented course for oil storage and transportation major students. Combining with the nature of oil transportation and storage project, it generalizes the basic knowledge of gas pipeline and its accessory instrument. It emphatically introduces the capacity of requirement and the balance between supply and need, the hydraulic power calculation of gas pipe. It scatters difficulty, adapts from simple to complex and makes steady progress in its content arrangement .With these principles, the students will master the long-distant natural gas pipeline transportation technique, further more, they could master all kinds of hydraulic power economic calculation of fuel gas pipeline. So they could have a steady base to engage in production practice and do science research.

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2001 12

### III

Collection & Transportation for oil-gasIII

36

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The course introduces study object, contents and construction features. Tasks: oilfield products and the quality index, oil-gas gathering and transportation flow process, properties of oil-gas and basic theory for oil-gas gathering and transportation systems in a more comprehensive manner. Focus on process design principles and calculation methods on gas-liquid separation. field gathering and transfer pipelines. dehydration and purification of crude oil. crude oil stabilization. gas purification of dehydration and sour gas. light hydrocarbon recovery and wasted-water process. Development and exploitation of oil fields are also briefly introduced.

2006 5

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