

# **RESERVOIR ENGINEERING**

## **Course Calendar**

**Course title:** Reservoir Engineering

**Lecturer:** Weibo Sui

**College:** Petroleum Engineering

| Course title    |     | Reservoir Engineering   |                          |            |            |        |
|-----------------|-----|---|--------------------------|------------|------------|--------|
| Reference books |     | 《Fundamentals of Reservoir Engineering》(L.P. Dake, 1978)<br>《油藏工程原理与方法》(姜汉桥, 姚军, 姜瑞忠, 2006)   |                          |            |            |        |
| Course feature  |     | Compulsory  | Total class              | 48 hrs     |            |        |
| Week            | No. | Teaching plan   | Class hours distribution |            |            | remark |
|                 |     |   | lecture                  | experiment | discussion |        |
| 1               | 1   | Chapter 1. Introduction<br>(1) Course information; Introduction to reservoir engineering.   | 2                        | 0          | 0          |        |
| 1               | 3   | Chapter 1. Introduction<br>(2) Petroleum exploration and development processes  |                          |            |            |        |
| 2               | 1   | Chapter 1. Introduction<br>(3) Fundamentals of reservoir system   | 2                        | 0          | 0          |        |
| 2               | 3   | Chapter 1. Introduction<br>(3) Fundamentals of reservoir system   | 2                        | 0          | 0          |        |
| 3               | 1   | Chapter 2. Reservoir Fluid Properties<br>(1) Basic fluid parameters and sampling methods<br>(2) Determining basic PVT parameters in laboratory (Part I)   | 2                        | 0          | 0          |        |
| 3               | 3   | Chapter 2. Reservoir Fluid Properties<br>(3) Determining basic PVT parameters in laboratory (Part II)<br>(4) Determining basic PVT parameters by correlations   | 2                        | 0          | 0          |        |
| 4               | 1   | Chapter 2. Reservoir Fluid Properties<br>(5) Formation testing and field applications   | 2                        | 0          | 0          |        |
| 4               | 3   | Exercise class (Chapters 1-3)   | 2                        | 0          | 0          |        |
| 5               | 1   | <b>National Day</b>   |                          |            |            |        |
| 5               | 3   | <b>National Day</b>   |                          |            |            |        |
| 6               | 1   | Chapter 3. Reservoir Performance Prediction: I Material Balance<br>(1) Material balance in general<br>(2) Reservoir driving mechanisms and characteristics of production.<br>(3) Material balance equation applied to gas reservoir | 2                        | 0          | 0          |        |
| 6               | 3   | Chapter 3. Reservoir Performance Prediction: I Material Balance<br>(4) Predicting oil reservoir performance using material balance equation   | 2                        | 0          | 0          |        |
| 7               | 1   | Chapter 3. Reservoir Performance Prediction: I Material Balance   | 2                        | 0          | 0          |        |

|    |   |   |   |   |   |  |
|----|---|---|---|---|---|--|
|    |   | (5) Calculating water influx by using material balance equation   |   |   |   |  |
| 7  | 3 | Chapter 3. Reservoir Performance Prediction: II<br>(6) Decline Curves Analysis  | 2 | 0 | 0 |  |
| 8  | 1 | Chapter 3. Reservoir Performance Prediction: III<br>(7) Water-drive Reservoir Characteristics Analysis  | 2 | 0 | 0 |  |
| 8  | 3 | Chapter 4. Well Testing<br>(1) The basics of well testing   | 2 | 0 | 0 |  |
| 9  | 1 | Chapter 4. Well Testing<br>(1) Pressure drawdown test, theory and its application<br>(2) Pressure build up test, theory and its application   | 2 | 0 | 0 |  |
| 9  | 3 | Chapter 4. Well Testing<br>(1) Flow regime and analysis method  | 2 | 0 | 0 |  |
| 10 | 1 | Exercise class (Chapters 4)   | 2 | 0 | 0 |  |
| 10 | 3 | Chapter 5. Immiscible Displacement and Waterflooding<br>Dynamic Performance Prediction<br>(1) Fractional flow and Buckley-Leverett displacement theory<br>(2) Oil recovery calculation  | 1 | 0 | 1 |  |
| 11 | 1 | Chapter 5. Immiscible Displacement and Waterflooding<br>Dynamic Performance Prediction<br>(3) Typical solutions of one-dimensional displacement (constant rate, constant injection-production pressure difference)<br>(4) Waterdrive under segregated condition | 2 | 0 | 0 |  |
| 11 | 3 | Chapter 5. Immiscible Displacement and Waterflooding<br>Dynamic Performance Prediction<br>(5) Engineering design of waterdrive projects<br>(6) Injection rate calculation for areal well patterns.  | 2 | 0 | 0 |  |
| 12 | 1 | Exercise class (Chapter 5)  | 2 | 0 | 0 |  |
| 12 | 1 | Chapter 6. Reservoir simulation   | 2 | 0 | 0 |  |
| 13 | 1 | Chapter 7. Field Development Plan<br>(1) How to write a field development plan<br>(2) Development strategy for special fields   | 2 | 0 | 0 |  |
| 13 | 4 | <b>Course review</b>  | 2 | 0 | 0 |  |