

PTEC 4301: Petroleum Production Technology



Section 795, Summer 2020

Basic Information

Instructor Name: Dr. Ahmed Alzahabi

OFFICE: EB Room 2.100D
OFFICE PHONE: (432) 552-3445
E-MAIL: alzahbai_a@utpb.edu
OFFICE HOURS: Through email only

This course is a Web Course and is conducted within Canvas at <http://utpb.instructure.com>

NOTE: The due dates and times for the activities will adhere to the Central Time Zone.

Course Description

Course Catalog Description:

This course is designed to cover the principals and technologies of well production, completion, production tubing, packers, sand control, wellhead, artificial lift, and surface facilities. It also provides students with in-depth understanding of principles of production technology.

Measurable Learning Outcomes:

1. An ability to apply knowledge of mathematics, science, and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, health and safety, manufacturability, and sustainability
4. An ability to identify, formulate, and solve engineering problems.
5. An ability to communicate effectively.
6. A recognition of the need for, and an ability to engage in lifelong learning.
7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

By the end of this course, you will be able to:

Discuss the basics of well production
Understand the components of production system
Discuss basics of sand production problems
Discuss basics of tubing strings

Explain principles of Sucker Rod Pump
Explain principles of ESP and PCP
Explain fundamentals of gas lift
Describe plunger lift and hydraulic pump systems
Describe the basics of wellhead and surface facilities

Prerequisites: PTEC 3304 or consent of instructor

Materials

Required Materials:

- Larry W. Lake.: Petroleum Engineering Handbook, Volumes IV: Production Operations Engineering, ISBN:978-1-55563-126-0, 2007.
- You may access the book for free via https://petrowiki.org/Category:Volume_IV_-_Production_Operations_Engineering https://petrowiki.org/Category:Volume_IV_-_Production_Operations_Engineering

Recommended Materials:

- SPE website
- Onepetro website
- Petrowiki website

Important Academic Dates

UTPB Academic Calendar:

<http://www.utpb.edu/services/academic-affairs/office-of-the-registrar/academic-calendar>

Course Overview

- The course is divided into four modules (parts).
- You should review the online lecture first, and then read the textbook section.
- The lectures will be summaries, elaborations of the textbook material, and links to related information on the Web.
- After you have completed reviewing the lecture, you should then log into "Discussion Tool" and post answers to the discussion question (specific to the module) posted by the instructor. You must also read other students' posts and respond to two other students' responses. Discussion posts must be made by the date on the schedule to receive full credit.
- You should also complete the Test/Quiz.
- Each Module/Section/Units covers:
 - textbook chapters.
 - online discussion topics, and
 - online homework
 - online Tests.

Readings: textbook chapters
Exams/Quizzes: 4 exams
Assignments: 4 homework assignments
Discussion Topics: 4 discussion boards
Final Exam: 1 exam
Presentations: No

Exams: Exams are closed book and no recourse can be used. All exams require respondus lockdown browser.

Homework: Each homework question will be graded based on the following criteria:

- Answer the question in completeness - include references - readings in the textbook or other sources (10 pt).
- Make strong original argument and personal perceptions and show in-depth knowledge of the response to the question asked if necessary (10 pt).
- The response should be grammatically correct and easy to understand (10 pt).

Discussions: You are welcome to participate in discussions with a good netiquette.

The discussions will be graded based on the following rubric:

- A-** Demonstrates an understanding of the discussion prompt/questions
- B-** Connections to professional practice
- C-** Connections to materials learned from the textbook or the lecture
- D-** Quality of writing and proofreading
- E-** Response to two other responses

The discussions will be graded based on the following rubric:

1. Demonstrates an understanding of the discussion prompt/questions
2. Connections to professional practice
3. Connections to materials learned from the textbook or the lecture
4. Quality of writing and proofreading
5. Response to two other responses
6. Timely first post for others to respond to your post

Grading: All assignment, quizzes, discussion boards, exams are graded with one week from the due date.

Course Activity	Points	Percentage of Total Grade
Assignment 1	75	7.5
Assignment 2	75	7.5
Assignment 3	75	7.5
Assignment 4	75	7.5
Quiz 1	100	10

Quiz 2	100	10
Quiz 3	100	10
Quiz 4	100	10
Discussion participation	50 (total)	5 (Total)
Topic # 1	(10)	(1)
Topic # 2	(10)	(1)
Topic # 3	(10)	(1)
Topic # 4	(20)	(2)
Final Exam	250	25
Total	1000	100

Grading Scale:

Grade Range %	Letter Grade
90 and above	A
80 to 89	B
70 to 79	C
60 to 69	D
Less than 59	F

Communication, Grading & Feedback:

- For general question regarding the course, please put your questions at the GENERAL QUESTION discussion topic area and your classmates may answer them. I will reply to your email if really needed.
- For personal question, you can email the instructor.
- All the course activities will be graded on absolute scale one week after the set due date.
- You can check your grades by going to Grade.
- If there is any discrepancy in the grade, you must contact me immediately. I will provide individual feedback or a general feedback in the performance of the course activity.

Time Management:

A student should expect to spend three hours on preparation and learning assignments for every semester credit hour. If a class is a 3-semester credit hour class, it is expected that a student should spend about 9 hours out of class on assignments in addition to 3 hours of in-class time for a total of about 12 hours per week to obtain an "A" in a class. It is important to develop a Time Management Plan to be successful.

Policies

1. **Discussion Board:** Discussion Board is primarily for discussing course related topics and issues. Best practices are:
 - a. Read all message postings in online discussion.
 - b. Respond to the question directly
 - c. Reply to minimum of two other student posts.
 - d. Use a person's name in the body of your message when you reply to their message.
 - e. Avoid postings that are limited to 'I agree' or 'great idea', etc.
 - f. Ensure responses to questions are meaningful, reflective.
 - g. Support statements with concepts from course readings, refer to personal experience, examples.
 - h. Follow **Rules of Behavior**.

2. **Rules of Behavior:** Discussion areas are public to every student in this class (including your instructor) who will see what you write. Please pay attention to the language you use and adhere to the following guidelines:
 - Do not post anything too personal.
 - Do not use language that is inappropriate for a classroom setting or prejudicial in regard to gender, race, or ethnicity.
 - Do not use all caps in the message box unless you are emphasizing (it is considered shouting).
 - Be courteous and respectful to other people on the list
 - Do not overuse acronyms like you would use in text messaging. Some of the list participants may not be familiar with acronyms.
 - Use line breaks and paragraphs in long responses.
 - Write your full name at the end of the posting.
 - Be careful with sarcasm and subtle humor; one person's joke is another person's insult.

3. **Make-Up/Late Submission Policy:** All course activities must be submitted before or on set due dates and times. **No late assignment is accepted.** If the student is unable to abide by the due dates and times, it is her/his responsibility to contact the instructor immediately.
 - The due dates and times for the activities will adhere to the Central Time Zone.
 - There will be no makeup examinations except under very exceptional circumstances pre-excused by the instructor, such as documented medical reasons, emergencies, or University sponsored activities. A copy of the official excused absence letter must be given to instructor for absences due to University sponsored activities as soon as the letter is issued to students. Any missed examination automatically receives a grade of ZERO.
 - Collaboration on examination (including exchange of books, calculators, etc.) is strictly prohibited.
 - Cheating on examinations could lead to an "F" grade in the course.

4. **Academic Dishonesty/Plagiarism/Cheating:** The academic community regards academic dishonesty as an extremely serious matter, with serious consequences. Any effort to gain an

advantage not given to all students is dishonest whether or not the effort is successful. Any suspicion of academic dishonesty will be reported and investigated. A student who engages in scholastic dishonesty that includes, but is not limited to cheating, plagiarism, and collusion will receive an "F" for the course.

All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. For complete information on UTPB student conduct and discipline procedures consult the university's handbook at: <http://ss.utpb.edu/dean-of-students/scholastic-dishonesty/>

Academic dishonesty includes, but is not limited to cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor, or the attempt to commit such acts.

Plagiarism includes, but is not limited to the appropriation of, buying, receiving as a gift, or obtaining by any means material that is attributable in whole or in part to another source, including words, ideas, illustrations, structure, computer code, other expression and media, and presenting that material as one's own academic work being offered for credit.

5. **Attendance and Class Participation:** Regular and active participation is an essential, unmistakably important aspect of this online course. Students will log on a minimum of three times every seven days. All students are expected to do the work assigned, notify the instructor when emergencies arise.
6. **Tracking:** The learning management systems have a tracking features. Statistics are collected that quantifies how often and when students are active in the course and provides information if the student has accessed different pages of the course.
7. **Absenteeism:** All the course activities have set dates to be completed and submitted. After the due dates the activities will not be available for the students. Not logging into an online course is considered absenteeism. Contact instructor immediately in case of emergency medical situation.
8. **Course Incomplete/Withdrawal/Grade Appeal:**
All students are required to complete the course within the semester they are signed up. Incomplete grades for the course are rarely given, will only be granted if the student provides a valid, documented excuse for not being able to complete the course on time, and has contacted the instructor prior to the scheduled last class to request an extension. The student signs a contract that includes the incomplete course activities and the new due dates.

Find information and dates regarding drops and withdrawals at <http://www.utpb.edu/services/academic-affairs/office-of-the-registrar/adds-drops>

For grade appeal process go to <http://www.utpb.edu/campus-life/dean-of-students/grievances>.

NOTE: The due dates and times for the activities will adhere to the Central Time Zone.

9. Accommodation for Students with Disabilities

Students with Disabilities: Americans with Disabilities Act: The University of Texas Permian Basin in compliance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act provides “reasonable accommodations” to students with disabilities. Only those students, who an Instructor has received an official Letter of Accommodation (LOA) sent by the Office of ADA for Students, will be provided ADA academic accommodations. The definition of a disability for purposes of ADA is that she or he (1) has a physical or mental impairment that substantively limits a major life activity, (2) has a record of such an impairment or, (3) is regarded as having such an impairment.

Students who have provided all documentation and are eligible for services will be advised of their rights regarding academic accommodations and responsibilities. The University is not obligated to pay for diagnosis or evaluations nor is it obligated to pay for personal services or auxiliary aids. Students needing assistance because of a disability must contact Testing Services & Academic Accommodations Department below, no later than 30 days prior to the start of the semester. There is additional charges or fees students will have to pay for in person or live remote proctoring of tests.

ADA Officer for Students: Mr. Paul Leverington

Address: Mesa Building 4242/4901 E. University, Odessa, Texas 79762

Voice Telephone: 432-552-4696

Email: ada@utpb.edu

For the accessibility and privacy statements of external tools used within online and blended UTPB courses, go to

https://www.utpb.edu/online/reach/ADA_Privacy

Computer Skills, Technical & Software Requirements

- All the course assessment activities will be submitted via Assignment Tool. Keep in mind the following standards/practices for submission of assignments:
 - All course assessment activity files that will be submitted to the instructor should be in MS Word or RTF
 - Be sure to put your name at the top of each page header
 - Always keep a copy of all the work you submit so that you won't need to re-do it if it should get lost in cyberspace.

Students can use cloud version of Word, PowerPoint and other Microsoft products through use of their UTPB Outlook 365 and UTPB email address. For more information refer to Student Services below or visit: <http://www.utpb.edu/services/ird/information-on-computer-accounts-e-mail/office-365>

To obtain software licensing and media for selected Microsoft titles at very low cost through a software agreement visit: <http://www.utpb.edu/services/ird/information-for-students/software-distribution/microsoft-select>.

Computer Technical Requirements:

Information at <http://www.utpb.edu/online/reach/technical-requirements>

You will find:

1. Requirements
2. Plug In Helper
3. Set up Information
4. Links to 24/7 Help Desk

Online Student Authentication

UTPB requires that each student who registers for an online course is the same student who participates in, completes, and receives credit for the course. UTPB's Distance Education Policy requires faculty members to employ at least two methods of verification to ensure student identities. To access online courses students must login to the UTPB learning management system using their unique personal identifying username and secure password. UTPB's Distance Education Policy requires at least one additional student identification method within the course that has been determined and approved by the faculty or academic program. This course satisfies the second method of student authentication by:

Proctored exams using an approved photo ID*, and Presentation of approved photo ID* through a web cam and video recorded proctoring during assessment (Respondus Monitor, Examity)

*Approved up to date photo identifications are: passports, government issued identification, driver's licenses, military ID from DoD. Dual credit and early college high school students use school district identifications.

Using LockDown Browser & Respondus Monitor for Online Exams

This course requires the use of LockDown Browser and Monitor for online exams. Watch this short video (<http://www.respondus.com/products/lockdown-browser/student-movie.shtml>) to get a basic understanding of LockDown Browser and Monitor.

Download and install LockDown Browser from this link:

<http://www.respondus.com/lockdown/download.php?id=841715130>

To take an online test, open LockDown Browser which opens Canvas and navigate to the exam. (You cannot access the exam with a standard web browser.)

When taking an online exam, follow these guidelines:

- Setup web cam for exams using Monitor.
- Ensure you are in a location where you won't be interrupted.
- Turn off all mobile devices, phones, etc.
- Clear your desk of all external materials — books, papers, other computers, or devices.
- Remain at your desk or workstation for the duration of the test.

- LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted.

Preparation for Emergencies

Computer Crash: Not having a working computer or a crashed computer during the semester will NOT be considered as an acceptable reason for not completing course activities at a scheduled time. NOTE: Identify a second computer before the semester begins, that you can use when/if your personal computer crashes.

Complete Loss of Contact: If you lose contact with course connectivity completely (i.e. you cannot contact me via Canvas or email), you need to call instructor, and leave message regarding connectivity loss and contact information.

Lost/Corrupt/Missing Files: You must keep/save a copy of every project/assignment on an external drive, UTPB Outlook 365 OneDrive, or personal computer. In the event of any kind of failure (e.g. virus infection, student's own computer crashes, loss of files in cyberspace, etc) or any contradictions/problems, you may be required to resubmit the files.

End-of-Course Evaluation & Instructor Evaluation

Every student is encouraged to complete an end-of-course evaluation/survey provided by UTPB. During the last few weeks of class, you will receive an announcement through email notifying you that the Course/Instructor Survey is available. You may follow the link in the email to complete the survey using the same credentials to access your courses here. When entering the emailed Survey link you will see a list of surveys for you to complete. Another way to find End-of-Course Evaluations is through your my.utpb.edu account > My Surveys & Evaluations are on the first page after you login.

The survey is anonymous and your responses are confidential. Your feedback is critical to us and to your instructor as we strive to improve our offerings, and our support of you, the students.

Student Support Services

SERVICE	CONTACT
ADA Accommodation/Support	Testing Services & Academic Accommodations Department (432) 552-2630 http://www.utpb.edu/academics/undergraduate-success/TSAAD
Advising	UTPB E-Advisor at http://cas.utpb.edu/academic-advising-center/e-advisor/
Bookstore	(432) 552-0220 http://www.bkstr.com/texas-permianbasinstore/home
Email, Outlook 365, my.utpb.edu	Information Resources Service http://www.utpb.edu/services/ird

Financial Aid and Scholarship	(432) 552-2620 http://www.utpb.edu/campus-life/financial-aid
Library	(432) 552-2370 The J. Conrad Dunagan Library Online at http://library.utpb.edu/
Registrar	(432) 552-2635 http://www.utpb.edu/services/academic-affairs/office-of-the-registrar
Student Services	http://www.utpb.edu/campus-life/dean-of-students
Technical Support	Canvas 1-866-437-0867 https://guides.instructure.com/
Tutoring & Learning Resources	If you are taking courses through UTPB the following links provide services: Smarthinking Online Tutoring (provides tutoring services), SmarterMeasure (measures learner readiness for online course). http://www.utpb.edu/online/reach/smarthinking-online-tutoring

Disclaimer & Rights

Information contained in this syllabus was to the best knowledge of the instructor considered correct and complete when distributed for use in the beginning of the semester. However, the instructor reserves the right, acting within the policies and procedures of UTPB to make changes in the course content or instructional techniques without notice or obligation. The students will be informed about the changes, if any.

Copyright Statement

Many of the materials that are posted within UTPB courses are protected by copyright law. These materials are only for the use of students enrolled in the course and only for the purpose of the course. They may not be further retained or disseminated.

Schedule

Module	Topics & Lectures	Activities & Due Dates
#1	Lecture #1: Inflow and Outflow Performance Lecture #2: Completion Systems Lecture #3: Completion Systems Lecture #4: Completion Systems	Discussion Topic #1 is due on July 7 @ 11:59 pm Homework #1 is due on July 9 @ 11:59 pm

	<p>Lecture #5: Tubing Selection, Design, and Installation</p> <p>Lecture #6: Tubing Selection, Design, and Installation</p> <p>Lecture #7: Perforating</p> <p>Lecture #8: Perforating</p>	<p>Test #1 is due on July 11 @ 11:59 pm</p>
#2	<p>Lecture #9: Sand Control</p> <p>Lecture #10: Sand Control</p> <p>Lecture #11: Sand Control</p> <p>Lecture #12: Artificial Lift Systems</p> <p>Lecture #13: Artificial Lift Systems</p> <p>Lecture #14: Sucker Rod Lift</p> <p>Lecture #15: Sucker Rod Lift</p> <p>Lecture #16: Sucker Rod Lift</p>	<p>Discussion Topic #2 is due on July 14 @ 11:59 pm</p> <p>Homework #2 is due on July 16 @ 11:59 pm</p> <p>Test #2 is due on July 18 @ 11:59 pm</p>
#3	<p>Lecture #17: Gas Lift</p> <p>Lecture #18: Gas Lift</p> <p>Lecture #19: Electrical Submersible Pumps</p> <p>Lecture #20: Electrical Submersible Pumps</p> <p>Lecture #21: Electrical Submersible Pumps</p> <p>Lecture #22: Electrical Submersible Pumps</p> <p>Lecture #23: Hydraulic Pumping in Oil Wells</p> <p>Lecture #24: Hydraulic Pumping in Oil Wells</p>	<p>Discussion Topic #3 is due on July 21 @ 11:59 pm</p> <p>Homework #3 is due on July 23 @ 11:59 pm</p> <p>Test #3 is due on July 30 @ 11:59 pm</p>
#4	<p>Lecture #25: Progressing Cavity Pumping Systems</p> <p>Lecture #26: Progressing Cavity Pumping Systems</p> <p>Lecture #27: Progressing Cavity Pumping Systems</p> <p>Lecture #28: Plunger Lift</p> <p>Lecture #29: Plunger Lift</p> <p>Lecture #30: The Production Facility</p>	<p>Discussion Topic #4 is due on July 28 @ 11:59 pm</p> <p>Homework #4 is due on July 30 @ 11:59 pm</p> <p>Test #4 is due on August 6 @</p>

	Lecture #31: Two-Phase Oil and Gas Separation Lecture #32: Flow Control at the Wellhead	11:59 pm
Final Exam due date is August 13 @ 11:59 pm		

Sample Syllabus