Discover Viterbi: Petroleum Engineering with Professor Iraj Ershaghi

Viterbi School of Engineering
University of Southern California
Fall 2019
Will I be able to get a copy of the slides after the presentation?

YES!

How can I ask a question during the information session?

1. Using the Q&A Panel, type a question in the box below the Ask drop-down menu.
2. Select a recipient from the Ask drop-down menu.
3. Click Send. We will respond as soon as we are able.
Today’s Program

- University of Southern California
- USC Viterbi School of Engineering
  - Graduate Programs in Petroleum Engineering
    - Program Overview
    - Application Criteria
- DEN@Viterbi
- Tuition & Fees
- Q&A
UNIVERSITY OF SOUTHERN CALIFORNIA
The University of Southern California

- Oldest Private University in the western U.S.
  - Founded in 1880
- 47,500 Students
  - 20,000 Undergraduates  |  27,500 Graduates
- 4,451 Full-time Faculty
- Diverse Student Population
- Located in Los Angeles
Viterbi School at a Glance

Academic Departments
- 8 Academic Departments

Faculty
- 188 tenure-track faculty
- 16 Full-time, TT NAE Members (30 Total)
- 70+ NSF CAREER, National & Presidential Young Investigator

Student Populations (Fall 2018)
- 2,767 Undergraduate
- 5,922 Graduate students

Research
- Leader in funded research
- 35+ Research Centers
- More than $207M in research expenditures annually
USC Engineering: Points of Distinction

- International Reputation for Excellence
- The Trojan Family Network: 77,000+ (engineers) strong
- Unique engineering programs available: Online, on site & on campus
- Complete range of programs
  - Doctoral, Masters and Bachelors
  - Graduate Certificates
  - Short Courses
  - Custom Programs
Best Engineering Graduate Schools
- Top 10 Ranked Graduate Engineering Program

Best Online Graduate Engineering Programs
- Ranked #1 Online Graduate Computer Information Technology Program (Computer Science)
- Ranked #2 Online Graduate Engineering Programs

Best Online Graduate Engineering Programs for Veterans
- Ranked #1 Online Graduate Computer Information Technology Program (Computer Science) for Veterans
- Ranked #2 Online Graduate Engineering Programs for Veterans
U.S. News & World Report, 2019

Best Petroleum Engineering Programs

University of Southern California (Viterbi)

Los Angeles, CA

#8 in Petroleum Engineering Programs

#9 in Best Engineering Schools

The Andrew and Erna Viterbi School of Engineering at University of Southern California (Viterbi) has an application... READ MORE

USC Viterbi
School of Engineering
The Viterbi School of Engineering: A Leader in Research

Viterbi School is a consistent leader in funded research in the U.S.

- Highly interdisciplinary research environment
- Diverse research areas such as robotics, software engineering, sensor networks, vision sciences, automated construction and photonics
- Over 35 research centers
- Industrial partnerships and collaboration
Meet Professor Iraj Ershaghi

Dr. Iraj Ershaghi

- Director of Petroleum Engineering
- Executive Director of the Chevron-USC Center for Interactive Smart Oilfield Technologies (CiSoft)
- Executive Director of UKC (USC-KOC) Center for Research and Education
- National Academy of Engineering Member
What Petroleum Engineering Graduate Programs are Offered by USC?
Petroleum Engineering: Program Offerings

- MS in Petroleum Engineering
- MS in Petroleum Engineering (Geoscience Technologies)
- MS in Petroleum Engineering (Smart Oilfield Technologies)
- MS in Petroleum Engineering / MS in Engineering Management (Dual Degree)
- Graduate Certificate in Petroleum Engineering (Smart Oilfield Technologies)
- Graduate Certificate in Petroleum Engineering (Unconventional Resources)
MS in Petroleum Engineering – Program Details

Program Requirements: 30-32 units selected under the direction of the student’s adviser

Required Courses (19 units)

- PTE 507 | Engineering and Economic Evaluation of Subsurface Reservoirs (3 units)
- PTE 508 | Numerical Simulation of Subsurface Flow and Transport Processes (3 units)
- PTE 517 | Testing of Wells and Aquifers (3 units)
- PTE 531 | Enhanced Oil and Gas Recovery (4 units)
- PTE 555 | Well Completion, Stimulation, and Damage Control (3 units)
- PTE 582 | Fluid Flow and Transport Processes in Porous Media (3 units)

Elective Courses (9 units)
See MS in Petroleum Engineering program page for a complete list of elective courses
https://viterbigradadmission.usc.edu/programs/masters/msprograms/petroleum-engineering/ms-petroleum-engineering/
MS in Petroleum Engineering (Geoscience Technologies) – Program Details

Available online via DEN@Viterbi

Program Requirements: 35 units

Required Courses (19 units)
- PTE 507 | Engineering and Economic Evaluation of Subsurface Reservoirs (3 units)
- PTE 508 | Numerical Simulation of Subsurface Flow and Transport Processes (3 units)
- PTE 517 | Testing of Wells and Aquifers (3 units)
- PTE 531 | Enhanced Oil and Gas Recovery (4 units)
- PTE 555 | Well Completion, Stimulation, and Damage Control (3 units)
- PTE 582 | Fluid Flow and Transport Processes in Porous Media (3 units)

Take 4 out of 5 Courses Shown Below (12-13 units)
- PTE 502 | Advanced Reservoir Characterization (3 units)
- PTE 503 | Technology of Unconventional Oil and Gas Resources Development (3 units)
- PTE 504 | Geophysics for Petroleum Engineers (3 units)
- PTE 505 | Inverse Modeling for Dynamic Data Integration (3 units)
- PTE 572L | Applied Geostatistical Modeling for Subsurface Characterization (4 units)

Elective Courses (4 units)
MS in Petroleum Engineering (Smart Oilfield Technologies) – Program Details

Program Requirements: 35 units

Required Courses (31 units)

- PTE 507 | Engineering and Economic Evaluation of Subsurface Reservoirs (3 units)
- PTE 508 | Numerical Simulation of Subsurface Flow and Transport Processes (3 units)
- PTE 517 | Testing of Wells and Aquifers (3 units)
- PTE 531 | Enhanced Oil and Gas Recovery (4 units)
- PTE 555 | Well Completion, Stimulation, and Damage Control (3 units)
- PTE 582 | Fluid Flow and Transport Processes in Porous Media (3 units)

Elective Courses (4 units)

- PTE 587 | Smart Completions, Oilfield Sensors and Sensor Technology (3 units)
- PTE 588 | Smart Oilfield Data Mining (3 units)
- PTE 589 | Advanced Oilfield Operations with Remote Immersive Visualization and Control (3 units)

Available online via DEN@Viterbi

See the program page for a complete list of elective courses https://viterbigradadmission.usc.edu/programs/masters/msprograms/petroleum-engineering/ms-pte-smart-oilfield-tech/
MS in Petroleum Engineering/ Engineering Management (Dual Program) – Program Details

Program Requirements: 45 units

Required Courses (37 units from PTE and ISE combined)

- PTE 507 | Engineering and Economic Evaluation of Subsurface Reservoirs (3 units)
- PTE 508 | Numerical Simulation of Subsurface Flow and Transport Processes (3 units)
- PTE 517 | Testing of Wells and Aquifers (3 units)
- PTE 531 | Enhanced Oil and Gas Recovery (4 units)
- PTE 555 | Well Completion, Stimulation, and Damage Control (3 units)
- ISE 500 | Statistics for Engineering Managers (3 units)
- ISE 514 | Advanced Production Planning and Scheduling (3 units)
- ISE 515 | Engineering Project Management (3 units)
- ISE 544 | Management of Engineering Teams (3 units)
- ISE 561 | Economic Analysis of Engineering Projects (3 units)
- ISE 566 | Financial Accounting Analysis for Engineering (3 units)

Elective Courses (9 units)
Graduate Certificate in Petroleum Engineering (Smart Oilfield Technologies) – Program Details

Program Requirements: 12 units

Required Courses (6 units)
- PTE 586 | Intelligent and Collaborative Oilfield Systems Characterization and Management (3 units)
- PTE 588 | Smart Oilfield Data Mining (3 units)

Additional courses – choose two (6 units)
- PTE 519 | Integrated Physical and Cyber Security for Oil and Gas Operations (3 units)
- PTE 587 | Smart Completions, Oilfield Sensors and Sensor Technology (3 units)
- PTE 589 | Advanced Oilfield Operations with Remote Immersive Visualization and Control (3 units)
Graduate Certificate in Petroleum Engineering (Unconventional Resources) – Program Details

Program Requirements: 12 units

Required Courses (12 units)

- PTE 502 | Advanced Reservoir Characterization (3 units)
- PTE 503 | Technology of Unconventional Oil and Gas Resources Development (3 units)
- PTE 504 | Geophysics for Petroleum Engineers (3 units)
- PTE 572L | Applied Geostatistical Modeling for Subsurface Characterization (4 units) or
- PTE 591 | Petroleum Geochemistry (3 units)
Where are USC Viterbi Petroleum Engineering alumni working?
Where Our Alumni Are Working

WHAT DO OUR STUDENTS DO?

WHAT DO OUR GRADUATES DO?
Can a student pursue a Petroleum Engineering graduate program online?
Course Delivery Methods

Methods of Course Delivery

- **On-campus, full time**
  - 3 classes per semester
  - 1.5 – 2 years to complete

- **Online delivery via DEN@Viterbi**
  - 1-2 classes per semester
  - 2.5 – 3 years to complete
How DEN@Viterbi Works

The Viterbi School of Engineering uses a state-of-the-art, proprietary web-based delivery system that enables students from around the world to access classes live or on-demand.

DEN@Viterbi Students:
- View the same lectures as on-campus students, with fresh content every semester
- Participate in highly interactive discussions with professors and peers
- Submit homework electronically
- Take exams at proctored testing centers near their home or work (or at USC if in the Los Angeles area)
## DEN@Viterbi Overview

<table>
<thead>
<tr>
<th></th>
<th>DEN@Viterbi Student</th>
<th>On-Campus Student</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program Admission</strong></td>
<td>USC Graduate Application &amp; required materials</td>
<td>USC Graduate Application &amp; required materials</td>
</tr>
<tr>
<td><strong>Weekly Course Lectures</strong></td>
<td>Online with Interactivity</td>
<td>On USC’s Campus</td>
</tr>
<tr>
<td><strong>Online Course Archives (Lectures &amp; Course Documents)</strong></td>
<td>✓</td>
<td>✓ *</td>
</tr>
<tr>
<td><strong>Assignments</strong></td>
<td>Submit electronically according to course deadlines</td>
<td>Submit during lecture or lab according to course deadlines</td>
</tr>
<tr>
<td><strong>Exams</strong></td>
<td>Proctored location</td>
<td>USC’s campus</td>
</tr>
<tr>
<td><strong>Courses per Semester (Average)</strong></td>
<td>1-2</td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Degree Completion Requirements</strong></td>
<td>27-37 units with a 3.0 GPA or above</td>
<td>27-37 units with a 3.0 GPA or above</td>
</tr>
<tr>
<td><strong>USC Diploma (No Distinction)</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*DEN@Viterbi Sections Only*
DEN@Viterbi’s E-Learning System

DEN@Viterbi Classroom
DEN@Viterbi’s E-Learning System

Table of Contents

Week 4

Lecture Video 09/13/2017

Lecture Video 09/13/2017

Breadcrumbs for easy navigation

Pull-out tab for easy weekly content access

Player controls include play/pause, and forward/rewind 30 seconds

Stream in HD, SD, or on your mobile device

Bookmark needed content areas

Navigate to the next item or previous
DEN@Viterbi’s E-Learning System

Helium Porosity vs. Air Permeability

- Used to select porosity cut-offs, for reservoir rocks.
- Based on permeability values.
Student Interactivity & Group Meetings

- All DEN@Viterbi students are provided access to their own meeting rooms which can be used for several purposes:
  - Enable video communication (web and mobile)
  - Integrate phone conferencing
  - Integrate fixed room IP video systems
  - Desktop sharing
  - Set up meetings with faculty, teaching assistants and peers

- Call in during live lectures

- Participate in live chats and threaded discussion boards
Question: Is there any difference between earning a Master’s degree on campus vs. via DEN@Viterbi?

Answer: **NO.** DEN@Viterbi is a delivery method. Students adhere to the:

- Same Admission Criteria
- Same Curriculum
- Same Exams and Homework
- Same Academic Standards and Graduation Requirements

Therefore... You earn the *same diploma* whether you earn the degree on-campus or online through DEN@Viterbi.
What are the Application Requirements and Tuition & Fees?
Application Criteria for Graduate Programs

Each program has unique application requirements – please be sure to review specific information for your program(s) of interest: 
https://viterbigradadmission.usc.edu/programs/masters/msprograms/petroleum-engineering/

General Application Criteria

- An undergraduate degree in Petroleum Engineering (or other engineering, math or hard science with assigned deficiencies) from a regionally accredited college or university
- A cumulative undergraduate GPA of at least 3.0 on a 4.0 scale is recommended (not required)
- Satisfactory scores on the general portion of the Graduate Record Examination (GRE) General Test that are less than five years old
- Resume/CV (Required)
- Personal Statement (Required)
- Letters of Recommendation (3 Required)
- TOEFL (International Applicants)
Application Deadlines

Fall 2020
- Deadline to submit all required materials: January 15, 2020*
- Deadline for Scholarship Consideration (on-campus only): December 15, 2019

Spring 2021
- Deadline to submit all required materials: September 15, 2020*
- Deadline for Scholarship Consideration (on-campus only): August 31, 2020

* A deadline extension for DEN@Viterbi applicants may be available. Please email DEN@Viterbi.usc.edu for more information.

Helpful Links:
- List of DEN@Viterbi Programs: http://viterbi.usc.edu/DENDegrees
- USC Graduate Application: https://usc.liaisoncas.com
DEN@Viterbi Additional Information

Limited Status

- Allows strong candidates with an undergraduate degree in engineering, math or a hard science from a regionally accredited institution with a cumulative GPA of at least 3.0 (on a 4.0 scale) to begin coursework before formal admission.
- Courses (maximum of 12 units) can be applied toward degree program if admitted but Limited Status does not guarantee formal admission.
- Get Started this Spring 2020 - completing your DEN@Viterbi Profile: viterbi.usc.edu/DENProfile

Employer Reimbursement Deferment

Students supported by a company can defer payment of up to 90% of tuition until after the semester is over.

Program Eligibility

- Your employer reimburses you for tuition at the end of each term.
- Your student account is current.

Program Participation Requirements (required every semester prior to the settlement deadline each term)

- Complete and submit deferment application
- Pay 10% of tuition, 100% of all fees and a $100 application fee
- Sign and submit promissory note packet to uscsfs@usc.edu

For additional information: https://sfs.usc.edu/payment/employer-reimbursement/
## Tuition & Fees (2019-2020)

### Example of tuition and fees for a DEN@Viterbi Student

<table>
<thead>
<tr>
<th>PER-COURSE FEES</th>
<th>Unit Cost</th>
<th>Tuition for 3-Unit Course</th>
<th>Tuition for 4-Unit Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition for 500/600 level course</td>
<td>$2,075</td>
<td>$6,225</td>
<td>$8,300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER-SEMESTER FEES</th>
<th>Cost</th>
<th>Total per semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Access Fee</td>
<td>$35</td>
<td>$35</td>
</tr>
<tr>
<td>Norman Topping Student Aid Fund</td>
<td>$8</td>
<td>$8</td>
</tr>
</tbody>
</table>

*Additional fees include textbooks ($150 - 200) and exam proctoring fees ($40 - 100)*
DEN@Viterbi Scholarship

Merit-based scholarships awarded to outstanding students pursuing a master’s program fully online via DEN@Viterbi

Scholarship Details

- Partial scholarships ranging from 1-4 units of tuition are available for students pursuing a Viterbi master’s program fully online and who receive partial or no tuition reimbursement funds from their employer.
- Funding provided during awarded academic year. Applicants can reapply each year for future scholarship consideration.
- For information on future DEN@Viterbi Scholarship options, please email DEN@Viterbi.usc.edu.

More Information & Application: http://viterbi.usc.edu/gradscholarships
Chevron-USC Partnership Fellowships

Chevron Corporation awards competitive fellowships to outstanding incoming Master’s students.

Scholarship Details

- **Award Amount:** $25,000 (paid over multiple years) and continual contact with Chevron executives, with opportunities for future internships and employment.
- **Eligibility:** Must be a new or PDP (progressive degree program), full-time, residential (on-campus) Master’s student. Two scholarships awarded to students in the MS in Petroleum Engineering (Smart Oilfield Technologies), and one to a student in either the MS in Chemical Engineering, MS in Materials Science or MS in Materials Engineering (two elective courses in Petroleum Engineering must be taken).
- Cumulative undergraduate GPA of 3.3 or higher (on a 4.0 scale).
- Must be a citizen or permanent resident of the U.S. or its territories.

More Information & How to Apply: [http://viterbi.usc.edu/gradscholarships](http://viterbi.usc.edu/gradscholarships)
Getting Started

For those interested in taking classes on campus:

- Visit USC campus
- Start your application: https://gradadm.usc.edu/apply/

For those interested in taking classes online via DEN@Viterbi:

- Start your application: https://gradadm.usc.edu/apply/ -or-
- Start as a Limited Status Student as early as Spring 2020
  Complete the DEN@Viterbi Profile: viterbi.usc.edu/denprofile
Contact Us

USC Viterbi School of Engineering
Admission & Student Engagement

On Campus: viterbi.gradadmission@usc.edu
DEN@Viterbi: DEN@Viterbi.usc.edu

213.740.4488

http://viterbi.usc.edu/gradprograms