MORK FAMILY DEPARTMENT
Department of Chemical Engineering & Materials Science

Cory Reano, Director, MFD Student Affairs
Ebonie Hawthorne, Assistant Director, MFD Student Services
AGENDA

• Introduction - Mork Family Department
• List of MS programs
• Faculty Advisors
• Student Affairs
• Program Overview
• Registering for courses
• Getting connected
• Q & A
Mork Family Department Website: https://chems.usc.edu/

Master’s Programs

- Chemical Engineering
- Materials Science
- Petroleum Engineering
MFD Masters Programs:

• Master of Science in Chemical Engineering
• Master of Science in Materials Engineering
• Master of Science in Materials Science
• Master of Science in Petroleum Engineering
• Master of Science in Petroleum Engineering Smart Oilfield Technologies
• Master of Science in Petroleum Engineering Geoscience Technologies
• Master of Science in Petroleum Engineering/Engineering Management
Faculty Advisor

Chemical Engineering
Dr. Katherine Shing
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Email knomura@usc.edu

Petroleum Engineering
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213-740-2227  
Office: VHE 604
Master of Science in Chemical Engineering

Requirements for Graduation 28 units total with 3.0 GPA overall (deficiency courses may be required for students without a CHE background):

1 unit Requirement: 1 unit of ChE 590 or approved additional unit from a 4 unit course

The nine courses are divided into 3 Groups:

**Group I: Required Core:** (All 4 required for 12-units total)
4 required core courses, all students must take:
ChE 501 Modeling and Analysis of Chemical Engineering Systems (Fall Semester)
ChE 530 Thermodynamics for Chemical Engineers (Fall Semester)
ChE 540 Viscous Flow (Fall Semester)
ChE 542 Chemical Engineering Kinetics (Spring Semester)

**Group II: Elective Core:** (Choose 2 for 6 units total)
ChE 541 Mass Transfer (Spring Semester)
ChE 544 Heat Transfer (Spring Semester)
ChE 586 Process Data Analytics and Machine Learning (Spring Semester)
ChE 502 Numerical Methods for Diffusive and Convective Transport*
ChE 560 Advanced Separation and Bioseparation Processes*
ChE 554 Principles of Tissue Engineering*

**Group III: Electives** (Choose 3 for 9 units total):
Choose from:
ChE 510 Energy and Process Efficiency
ChE/AME 513 Principles and Process Efficiency
ChE/MASC 523 Principles of Electrochemical Engineering*
ChE/PTE 531 Enhanced Oil recovery
ChE 532 Vapor-Liquid Equilibria*
ChE 572 Advanced Topics in Polymer Kinetics & Rheology*
ChE/PTE 582 Fluid Flow and Transport Processes in Porous Media
ChE 590 (Directed Research, 1 - 3 units, approval of research advisor required before registering)

Please note that Graduate Students Cannot Count More than 9 units of 400 Level Courses towards Their MS Degree
ChE 450 Sustainable Energy
ChE 472 Polymer Science & Engineering
ChE 474L Polymer Science Engineering Laboratory*
ChE 475 Physical Properties of Polymers
ChE 477 Computer Assisted Polymer Engineering and Manufacturing I*
ChE 486 Design of Environmentally Benign Process Design*
ChE 487 Nanotechnology and Nanoscale Engineering through Chemical Processes
ChE 489 Biochemical Engineering
ChE 499 Chemical Process Safety

Approved 400-level or above courses in Math, Science & Engineering.
Note: Courses marked with * are not offered on regular schedule.

https://chems.usc.edu/academics/graduate-programs/chemical-engineering/
Master of Science in Materials Science

Requirements for Graduation 27 units total with 3.0 GPA overall:

Core Courses: 21 units
- MASC 501 Solid State
- MASC 503 Thermodynamics of Materials
- MASC 504 Diffusion and Phase Equilibria
- MASC 505 Crystals and Anisotropy
- MASC(EE) 471 Applied Quantum Mechanics for Engineers
- MASC 551 Mechanical Behavior of Engineering Materials
- CHE 501 Modeling and Analysis of Chemical Engineering Systems

Electives:
The remaining 6 units may be graduate courses outside of Materials Science with departmental approval.

https://chems.usc.edu/academics/graduate-programs/materials-science/
Master of Science in Materials Engineering

Requirements for Graduation 27 units total with 3.0 GPA overall:

Core Courses: 18 units
A minimum of 18 units must be graduate courses in Materials Science.

Electives:
The remaining 9 units may be graduate courses outside of Materials Science with departmental approval.

https://chems.usc.edu/academics/graduate-programs/materials-science/
Core Courses
- MASC 501 Solid State
- MASC 502 Advanced Solid State
- MASC 503 Thermodynamics of Materials
- MASC 504 Diffusion and Phase Equilibria
- MASC 505 Crystals and Anisotropy
- MASC 506 Semiconductor Physics
- MASC 511 Materials Preparation
- MASC 514L Processing of Advanced Semiconductor Devices
- MASC 523 Principles of Electrochemical Engineering
- MASC 524 Techniques and Mechanisms in Electrochemistry
- MASC 534 Materials Characterization
- MASC 535L Transmission Electron Microscopy
- MASC 548 Rheology of Liquids and Solids
- MASC 551 Mechanical Behavior of Engineering Materials
- MASC 559 Creep
- MASC 560 Fatigue and Fracture
- MASC 561 Dislocation Theory and Applications
- MASC 562 Failure Analysis
- MASC 564 Composite Processing
- MASC 570 Introduction to Photovoltaic Solar Energy Conversion
- MASC 575 Basics of Atomistic Simulation of Materials
- MASC 576 Molecular Dynamics Simulations of Materials and Processes
- MASC 583 Materials Selection
- MASC 584 Fracture Mechanics and Mechanisms
- MASC 599 Special Topics
- MASC 601 Advanced Semiconductor Device Physics
- MASC 606 Nonequilibrium Processes in Semiconductors
- MASC 610 Molecular Beam Epitaxy

List of Approved Electives
- AME 503 Advanced Mechanical Design
- AME 509 Applied Elasticity
- AME 525 Engineering Analysis
- AME 526 Engineering Analytical Methods
- AME 577 Survey of Energy and Power for a Sustainable Future
- AME 578 Modern Alternative Energy Conversion Devices
- AME 588 Materials Selection
- BME 410 Introduction to Biomaterials and Tissue Engineering
- CE 507 Mechanics of Solids I
- CE 529ab Finite Element Analysis
- CE 546 Structural Mechanics of Composite Materials
- CHE 475 Physical Properties of Polymers
- CHE 501 Modeling and Analysis of Chemical Engineering Systems
- CHEM 463L Chemical Nanotechnology Laboratory
- EE 480 Introduction to Nanoscience and Nanotechnology
- EE 504L Solid State Processing and Integrated Circuits Laboratory
- EE 513 Solid State Energy Devices
- EE 529 Optics
- EE 531 Non-linear Optics
- EE 537 Modern Solid-State Devices
- EE 540 Introduction to Quantum Electronics
- EE 601 Semiconductor Devices
- EE 606 Nonequilibrium Processes in Semiconductor
- EE 607 Microelectromechanical Systems
- EE 612 Science and Practice of Nanotechnology
- ENE 505 Energy and the Environment
- ISE 515 Engineering Project Management
- ISE 525 Design of Experiments
Master of Science in Petroleum

Requirements for Graduation 27 units total for Petroleum Engineering with 3.0 GPA overall (15 additional units min. of deficiency courses are required for students without a B.S. in Petroleum Engineering):

Core Courses: 18 units
- PTE 507 Engineering and Economic Evaluation of Subsurface Reservoirs
- PTE 508 Numerical Simulation of Subsurface Flow and Transport Processes
- PTE 517 Testing of Wells and Aquifers
- PTE 531 Enhanced Oil Recovery
- PTE 555 Well Completion, Stimulation, and Damage Control
- PTE 582 Fluid Flow and Transport Processes in Porous Media

Electives (9 units for MS PTE):
- 502, 503, 504, 505, 506, 511, 512, 514, 515, 519, 542, 545, 572, 574, 578, 581, 586, 587, 588, 589 and 590

Deficiency Courses
- 411, 412, 461, 466, 500

http://catalogue.usc.edu/schools/engineering/petroleum-engineering/courses/
Requirements for Graduation 34 units total with 3.0 GPA overall (15 additional units min. of deficiency courses are required for students without a B.S. in Petroleum Engineering):

Core Courses: 30 units
- PTE 507 Engineering and Economic Evaluation of Subsurface Reservoirs
- PTE 508 Numerical Simulation of Subsurface Flow and Transport Processes
- PTE 517 Testing of Wells and Aquifers
- PTE 531 Enhanced Oil Recovery
- PTE 555 Well Completion, Stimulation, and Damage Control
- PTE 582 Fluid Flow and Transport Processes in Porous Media
- PTE 586 Intelligent and Collaborative Oilfield Systems Characterization and Management
- PTE 587 Smart Completions, Oilfield Sensors and Sensor Technology
- PTE 588 Smart Oilfield Data Mining
- PTE 589 - Advanced Oilfield Operations with Remote Immersive Visualization and Control

Electives (4 units):
- PTE 502, 503, 504, 505, 506, 511, 512, 514, 515, 519, 542, 545, 572, 574, 578, 581, 590

Deficiency Courses
- 411, 412, 461, 466, 500
Master of Science in Petroleum Engineering (Geoscience Technologies)

Requirements for Graduation 34 units total with 3.0 GPA overall (15 additional units min. of deficiency courses are required for students without a B.S. in Petroleum Engineering):

Core Courses: 30 units
- PTE 502 Advanced Reservoir Characterization
- PTE 503 Technology of Unconventional Oil and Gas Resources Development
- PTE 504 Geophysics for Petroleum Engineers
- PTE 505 Inverse Modeling for Dynamics Data Integration
- PTE 507 Engineering and Economic Evaluation of Subsurface Reservoirs
- PTE 508 Numerical Simulation of Subsurface Flow and Transport Processes
- PTE 517 Testing of Wells and Aquifers
- PTE 531 Enhanced Oil Recovery
- PTE 555 Well Completion, Stimulation, and Damage Control
- PTE 582 Fluid Flow and Transport Processes in Porous Media

Electives (4 units):
4 units of an elective course i.e. PTE 572 (Engineering Geostatistics)

Deficiency Courses
411, 412, 461, 466, 500
Master of Science in Petroleum Engineering/Engineering Management

Requirements for Graduation: 45 units total with 3.0 GPA overall (15 additional units min. of deficiency courses are required for students without a B.S. in Petroleum Engineering):

Core Courses: 36 units
- ISE 500 Engineering Management Decisions and Statistics
- ISE 514 Advanced Production Planning and Scheduling
- ISE 515 Engineering Project Management
- ISE 544 Management of Engineering Teams
- ISE 561 Economic Analysis of Engineering Projects
- 1 Pre-approved Business Management Course (3 units)
- PTE 507 Engineering and Economic Evaluation of Subsurface Reservoirs
- PTE 508 Numerical Simulation of Subsurface Flow and Transport Processes
- PTE 517 Testing of Wells and Aquifers
- PTE 531 Enhanced Oil Recovery
- PTE 555 Well Completion, Stimulation, and Damage Control
- PTE 582 Fluid Flow and Transport Processes in Porous Media

Electives (9 units):
- 9 units of PTE elective courses

Deficiency Courses (required for Non-BS PTE students)
- 411, 412, 461, 466, 500
Spring 2020 DEN Courses [https://classes.usc.edu/term-20201/classes/masc/](https://classes.usc.edu/term-20201/classes/masc/)

Materials Science
- MASC 504
- MASC 551
- MASC 560
- MASC 575

Chemical Engineering
- CHE 530
- CHE 541
- CHE 544

Petroleum Engineering
- PTE 412x
- PTE 508
- PTE 515
- PTE 517
- PTE 531
- PTE 578
- PTE 589
How To Request D-clearance From DEN

All DEN courses require D-clearance.

1. Login to DEN Desire2Learn: [http://courses.uscden.net](http://courses.uscden.net)
2. Go to DEN@Viterbi Tools on the navigation bar
3. Select “Request D-clearance” link, select the term, and select a course
4. Approval process takes 1-2 business days. To view the status of a request, click on “Check D-Clearance Status”
5. You can register once your request has been processed. D-clearances expire 7 days from when it is issued so register as soon as you obtain it to secure a seat in a course.

For questions on D-Clearance status, contact [den@vase.usc.edu](mailto:den@vase.usc.edu)
University Calendar – Spring 2020

Jan. 10  Last day to register and pay without late fee
Jan. 13  Spring semester classes begin
Jan. 13-17  Late registration and change of program
Jan. 20  Martin Luther King Day, University holiday

Jan. 31  Last day to drop a class without a mark of "W," except for Monday-only classes, and receive a 100% refund

Jan. 31  Last day to register and add classes
Jan. 31  Last day to change enrollment option to Pass/No Pass or Audit
Jan. 31  Last day to purchase or waive tuition refund insurance
Jan. 31  Deadline for purchasing or showing proof of health insurance
<table>
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<tr>
<th>Date</th>
<th>Event</th>
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<tr>
<td>Feb. 4</td>
<td>Last day to drop a Monday-only class without a mark of “W” and receive a 100% refund or change to Pass/No Pass or Audit</td>
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<td>Feb. 18</td>
<td>President’s Day, University Holiday</td>
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<tr>
<td>Feb. 28</td>
<td>Last day to drop a class <strong>without</strong> a mark of “W” (no refund)</td>
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<tr>
<td>March 15-22</td>
<td>Spring Recess</td>
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<td>April 3</td>
<td>Last day to drop a class <strong>with</strong> a mark of “W”</td>
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<tr>
<td>May 1</td>
<td>Spring semester classes end</td>
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<tr>
<td>May 2-5</td>
<td>Study days</td>
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<td>May 6-13</td>
<td>Final examinations</td>
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<tr>
<td>May 14</td>
<td>Spring semester <strong>end</strong></td>
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<tr>
<td>May 15</td>
<td>Commencement</td>
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<tr>
<td>May 20</td>
<td>Summer 2020 classes begin</td>
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Please see the complete calendar at [http://classes.usc.edu/term-20201calendar/](http://classes.usc.edu/term-20201calendar/)

USC Viterbi School of Engineering
Contact Info

VITERBI ADMISSION & STUDENT ENGAGEMENT (VASE)

Location: Olin Hall of Engineering (OHE), Rm. 106
Hours: Mon. - Fri. 8:30 am - 5 pm (Pacific Time)
Phone: (213) 740-4488 | Fax: (213) 821-0851
https://viterbigrad.usc.edu/

<table>
<thead>
<tr>
<th>DEN@Viterbi Support</th>
<th>Contact Information</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical support, Desire2Learn training, Homework</td>
<td><a href="mailto:dentsc@usc.edu">dentsc@usc.edu</a></td>
<td>Rebecca Lee</td>
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<tr>
<td>DEN d-clearance inquiries</td>
<td><a href="mailto:den@vase.usc.edu">den@vase.usc.edu</a></td>
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<tr>
<td>Exams</td>
<td><a href="mailto:denexam@usc.edu">denexam@usc.edu</a></td>
<td>Shirley Schutt</td>
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<tr>
<td>VASE Advisor</td>
<td><a href="mailto:ptrinida@usc.edu">ptrinida@usc.edu</a></td>
<td>Patty Rinehart</td>
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<tr>
<td>• General advisement</td>
<td>213-740-0116</td>
<td></td>
</tr>
<tr>
<td>• Policies &amp; Procedures</td>
<td>213-740-9356</td>
<td></td>
</tr>
</tbody>
</table>
How to make an appointment with your academic advisor

For Chemical Engineering and Material Science students:
MFD Student Affairs Office
Email: mfdstudentaffairs@vsoe.usc.edu
Telephone: (213) 740-4339

For Petroleum Engineering students:
Ebonie Hawthorne
hawthorne@vsoe.usc.edu
(213) 740-0322
Get Connected

• Student groups- AIChE, MFD GSA, MRS@USC, SPE, and VGSA
  • Professional Conferences
  • Network Sessions
  • Study Groups
  • Career fairs
  • Faculty panels
  • Alumni Panels
  • Social Events
• Career Services
• VASE Office
• Check in with your advisors
• Research
THANK YOU!