

MASTER OF SCIENCE IN PETROLEUM ENGINEERING

The Master of Science degree in the Department of Petroleum Engineering is a thesis option research-based degree that will prepare graduates with the skills to pursue global opportunities in the petroleum industry.

The research skills developed through fundamental courses in multiple areas of petroleum engineering will enable graduates to be successful leaders in the petroleum field of their choice.

Recognized worldwide, "Aggie Petroleum Engineers" conduct research in state-of-the-art facilities on topics such as:

- Analytical, Semi-Analytical, and Hybrid-Analytical Numerical Models for Modeling, Optimization, and Prediction
- Artificial Lift and Flow Assurance
- Carbon Capture, Utilizations, and Storage (CCUS)
- Closed-Loop Reservoir Management, Production Optimization and Control
- Coupled Computing Processes (Flow, Thermal, Geomechanical, Geochemical, Geophysical)
- Data Analytics, Sensor Validation and Machine Learning
- Data-Driven and Physics-Based Multiphysics Modeling in Porous Media
- Development and Assessment of Conventional and Unconventional Oil and Gas Reservoirs
- Distributed Acoustics, Temperature, and Fiber Optics (Strain) Sensing and Interpretation
- Drilling - Physics-Based Drilling Performance, Deepwater Drilling, Well Control
- Energy Transition and Decarbonization (Geothermal, CCUS, H₂ Storage, Natural N₂, Critical Minerals)
- Enhanced Oil Recovery (EOR), Improved Oil Recovery (IOR)
- Gas Reservoir Engineering and Management
- Integrated Reservoir Characterization and Reservoir Management
- Inverse Modeling and Multi-Scale Data Integration
- Machine Learning and Data Analytics
- Natural Gas Hydrates
- Numerical Methods and Applications of Computing
- Oilfield Leak Detection (Facilities and Pipelines)
- Petroleum Economics for Conventional Reservoirs and Unconventional Resource Plays
- Produced and Waste Water Management
- Production Logging and Monitoring
- Reservoir Fluids - Fluid Characterization (Conventional and Unconventional Reservoirs) and Applications in Reservoir Engineering
- Reservoir Geomechanics - Theoretical, Experimental, and Applied Methods
- Reservoir Petrophysics - Laboratory Methods, Formation Evaluation, Multiphase Flow (Theory and Applications)
- Risk and Uncertainty Assessment in Petroleum Engineering Applications
- Surface Facilities Related to Oil and Gas Production

- Streamline Simulation
- Thermal and Heavy Oil Recovery Methods
- Well Abandonment Practices
- Well Completions
- Well Diagnostics and Analysis/Modeling of Well Performance
- Well Stimulation (Hydraulic Fracturing, Acidizing, Profile Modification)

Students are mentored by internationally acclaimed faculty, including National Academy of Engineering members and numerous SPE award recipients.

This program is also approved for delivery via asynchronous distance education technology, providing flexibility for students, including working professionals.

Steps to Fulfill a Masters Program (<https://catalog.tamu.edu/graduate/academic-expectations-general-degree-requirements/#stepstofulfillgraduateprogramtext>)

Program Requirements

Program Requirements

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Student's Advisory Committee

On-Campus and Distance Education Degree Programs

After receiving admission to graduate studies, students will consult with the graduate program concerning selection of a chair and members (if applicable) for an advisory committee representative of the student's field(s) of study and research.

For the Master of Science in Petroleum Engineering thesis option, after receiving admission to graduate studies and enrolling for coursework, the student will consult with the head of their major or administrative department (or intercollegiate faculty, if applicable) concerning appointment of the chair of his or her advisory committee. The student's advisory committee for the MS degree will consist of no fewer than three members of the graduate faculty, representative of the student's fields of study and research. The chair or the co-chair of the advisory committee must be from the student's major department (or intercollegiate faculty, if applicable), and at least one or more of the members must have an appointment to a department other than the student's major department. The outside member for students in an interdisciplinary program must have an appointment to a department different from the chair of the student's committee. The chair, in consultation with the student, will select the remainder of the advisory committee. The student will interview each prospective committee member to determine whether they are willing to serve.

Only members of the Graduate Committee Faculty located on Texas A&M University campuses may serve as chair of a student's advisory committee. Other members of the Graduate Committee Faculty –

including those located outside the university or off-campus (if permitted by program, department, and college/school policy) – may serve as a co-chair or member.

The advisory committee as a group – and as individual members – are responsible for advising the student on academic matters. The duties include responsibility for approving the student's proposed degree plan; research proposal (if applicable); thesis (if applicable); and conducting examinations (if required). The advisory committee members' approval of a degree plan indicates their willingness to accept the responsibility for guiding and directing the entire academic program of the student and for initiating all academic actions concerning the student. Additionally, in the case of academic deficiency, the advisory committee is responsible for initiating recommendations to the Graduate and Professional School.

The chair of the advisory committee, who usually has immediate supervision of the student's degree program, has the responsibility for calling meetings at any time considered desirable.

If the chair of the student's advisory committee is unavailable for an extended period of time in any academic period during which the student is involved in activities relating to an internship, thesis or professional paper – and is registered for courses such as 684, 691, 692, or 693 – the Department Head or intercollegiate faculty Chair may appoint an alternate advisory committee chair during the interim period.

If the chair of a student's advisory committee is on an approved leave of absence – and the student is near completion of the degree and wants the chair to continue to serve in this role – a written request must be submitted to the Associate Provost and Dean of the Graduate and Professional School, by the Department Head or intercollegiate faculty Chair, that the faculty member who is on an approved leave of absence be allowed to continue to serve as chair of the advisory committee – without a co-chair – for up to one year. The request must confirm that the faculty member is able to engage in the required duties as chair during the leave of absence. Extensions beyond the one-year period (if necessary) may be granted with additional approval of the Associate Provost and Dean of the Graduate and Professional School.

If the chair of a student's advisory committee voluntarily separates from the university, and the student is nearing completion of the degree, the chair may continue to serve in this role – at the student's request – for up to one year. Two options are available:

- The chair may continue, with a co-chair, without additional approval by the Graduate and Professional School. The student must select a current member of the Graduate Committee Faculty – from the student's academic program and located near the Texas A&M University campus site – to serve as co-chair of the advisory committee.
- The chair may continue, without a co-chair, with approval by the Graduate and Professional School. A written request must be submitted to the Associate Provost and Dean of the Graduate and Professional School by the Department Head or intercollegiate faculty Chair to allow the faculty member to continue as chair, without a co-chair, of the advisory committee.

For both options, extensions beyond the one-year period (if necessary) may be granted with approval of the Associate Provost and Dean of the Graduate and Professional School.

Although individual advisory committee members may be replaced by petition for valid reasons, all members of a student committee cannot resign *en masse*.

Degree Plan

On-Campus and Distance Education Degree Programs

Students, in consultation with the advisory committee, will develop a proposed degree plan. The degree plan must be created, submitted, and approved through the online Document Processing Submission System (<http://ogsdps.tamu.edu/>) (DPSS). The degree plan must be submitted prior to the deadline imposed by the student's college or school and approved by the Graduate and Professional School no later than 90 days prior to the date of the final oral examination or thesis defense. Students must select the appropriate program option when submitting a proposed degree plan.

Additional coursework may be added to the approved degree plan by petition through DPSS, if deemed necessary by the advisory committee, to correct deficiencies in the student's academic preparation. No changes can be made to the degree plan once the student's Final Examination Request or Final Examination Exemption Request is approved by the Graduate and Professional School.

Coursework included on the degree plan is subject to the requirements and restrictions detailed in the Credit Requirements and Limitations on Credits and Coursework sections in each degree program page.

Degree program time limits apply to courses listed on a degree plan. Details are available on the Time Limits section in each degree program page.

Credit Requirements

On-Campus and Distance Education Degree Programs

A minimum of 30 semester credit hours is required for the Master of Science thesis option degree.

This program does not offer a non-thesis option.

Ordinarily, students will devote the major portion of their time on work in one or two closely related fields. Other work will be in supporting fields of interest.

Limitations on Credits and Coursework

On-Campus and Distance Education Degree Programs

Credit-hour requirements are subject to the following limitations:

1. To receive a graduate degree from Texas A&M University, students must earn one-third or more of the credits through the institution's own direct instruction. These limitations also apply to joint degree programs.
2. Transfer credits may be used toward meeting the credit hour requirements under the following limitations:
 - The maximum number of credit hours which may be considered for transfer credit is the greater of 12 credit hours or one-third (1/3) of the total hours of a degree plan.
 - Graduate and/or upper-level undergraduate courses taken in residence at an accredited United States or international institution (recognized by the Office of Admissions), with a final grade of B or greater, may be considered for transfer credit if – at the time the courses were completed – the courses would be accepted for credit toward a similar

- degree for a student in degree-seeking status at the host institution.
- An official transcript from the institution at which the transfer coursework was taken must be sent directly to the Office of Admissions. Coursework credit submitted for transfer from any institution must be shown in semester credit hours or equated to semester credit hours.
 - Up to 1 hour of credit may be obtained for each five-day week of coursework for graduate courses of three weeks' duration or less taken at other institutions. Each week of coursework must include at least 15 contact hours.
 - Grades for courses completed at other institutions are not included in computing the GPA.
 - Coursework in which no formal grades were given, or in which grades other than A or B were earned (for example, CR, P, S, U, H, etc.), is not accepted for transfer credit.
 - Courses completed at Texas A&M University and appearing on the degree plan with grades of D, F, or U may not be absolved by transfer work.
 - Except for officially approved cooperative doctoral programs, credit for thesis or dissertation research – or the equivalent – is not transferrable.
 - Courses used toward a degree at another institution may not be applied for transferred graduate credit.
 - Courses used toward a certificate, but not applied to an awarded degree, may be considered for transfer.
 - If the course to be transferred was taken for a certificate or prior to the conferral of a degree at the transfer institution, a letter from the registrar at that institution stating that the course was not applied for credit toward the degree must be submitted to the Graduate and Professional School.
 - A student who has earned 12 credit hours of graduate credit in residence at Texas A&M University may be authorized to transfer courses in excess of the limits upon the advice of the advisory committee and with the approval of the Graduate and Professional School.
3. The maximum number of credit hours taken in post-baccalaureate non-degree (G6) classification at Texas A&M University which may be considered for application to the degree plan is 12.
 4. Only grades of A, B, C, and S are acceptable for graduate credit.
 5. Graduate courses on a degree plan may not be taken on an S/U basis except for 681 (Seminar), 684 (Professional Internship), 690 (Theory of Research), 691 (Research), 692 (Professional Study), 693 (Professional Study), 695 (Frontiers in Research), 697 (Methods), 791 (Doctoral Capstone), or SOPH 680 (Public Health Capstone).
 6. A student pursuing a non-thesis option Master's degree may not enroll in 691 (Research) courses for any reason. Under special circumstances, however, students in a non-thesis Master of Arts or Master of Science degree program may request use of 691 hours on the degree plan under the following conditions:
 - The Department Head or intercollegiate faculty Chair (if applicable) for the program may approve an exception for a student who changes to a non-thesis option MA or MS degree program from a PhD (after at least one year of studies) or a thesis option MA or MS degree.
 - If approved, a maximum of 8 credit hours in combination of 685 (Directed Studies) and 691 may be used.
 - Colleges/schools, departments, and interdisciplinary degree programs may establish additional requirements.
 7. A maximum of 12 credit hours may be used, in any combination, of the following:
 - No more than 8 credit hours in a combination of 684, 691 (if permitted), or SOPH 680.
 - No more than 8 credit hours of 684 for thesis option Master's degrees.
 - No more than 3 credit hours of 684 for non-thesis option Master's degrees.
 - No more than 8 credit hours of 685 (Directed Studies).
 - No more than 3 credit hours of 690 (Theory of Research).
 - No more than 3 credit hours of 695 (Frontiers in Research).
 8. A maximum of 3 credit hours may be used toward the non-thesis option Master's degree, in any combination, of the following:
 - No more than 2 credit hours of 681 (Seminar).
 - No more than 3 credit hours of 684 (Professional Internship).
 - No more than 3 credit hours of 685 (Directed Studies).
 9. Certain zero-credit courses may be allowed for Master's degree programs:
 - A zero-credit 684 (Professional Internship) or 685 (Directed Studies) course is only allowed for non-thesis option Master's programs.
 - A zero-credit 681 (Seminar) course may be used for either thesis or non-thesis option Master's programs.
 - Other courses, including 691 (Research) hours, are not eligible for zero credit.
 10. No more than 25 percent of the total credit-hours required on the student's degree plan may be in any combination of 684, 685, 690, 691 (if permitted), and 695.
 11. A maximum of 9 hours of advanced undergraduate courses (300- or 400-level) may be considered for application to the degree plan.
 12. No more than 50 percent of the non-research coursework required for an in-person degree program may be completed through distance education courses.
 13. Continuing education or extension courses may not be used for graduate credit.
- Some departments may have additional or more restrictive requirements. Exceptions will be permitted only in unusual cases and when petitioned by the student's advisory committee and approved by the Graduate and Professional School.
- ## Thesis Option
- ### On-Campus and Distance Education Degree Programs
- An acceptable thesis is required for the Master of Science degree for a student who selects the thesis option program. The finished work must reflect a comprehensive understanding of the pertinent literature and express in clear English, the problem(s) for student, the method, significance, and results of the student's original research. Thesis formatting must be acceptable to the Graduate and Professional School as outlined in the Guidelines for Theses, Dissertations, and Records of Study.

After successful defense (or exemption) and approval by the student's advisory committee and the head of the student's major department (or chair of intercollegiate faculty, if appropriate), the student must submit the thesis in electronic format as a single PDF file to <https://etd.tamu.edu/>. Additionally, a thesis approval form with original signatures must be received by the Graduate and Professional School through the Academic Requirements Completion System (ARCS). Both the PDF file and the completed approval form must be received by the deadline.

Deadline dates for submitting the thesis are announced each semester or summer term in the "Graduate and Professional School Calendar" (see Time Limit statement). These dates also can be accessed *via* the Graduate and Professional School website (<http://grad.tamu.edu/>).

Each student who submits a manuscript for review is assessed a one-time thesis/dissertation processing fee through Student Business Services. This processing fee is for the thesis/dissertation services provided. After commencement, theses and dissertations are digitally stored and made available through the Texas A&M Libraries.

A thesis that is deemed unacceptable by the Graduate and Professional School because of excessive corrections will be returned to the student's department head or chair of the intercollegiate faculty, if applicable. The manuscript must be resubmitted as a new document, and the entire review process must begin again. All original submittal deadlines must be met during the resubmittal process to graduate.

Thesis Proposal

For thesis option students, a Research Proposal must be submitted to the Graduate and Professional School *via* the Academic Requirements Completion System (ARCS) at least 20 working days prior to the submission of the Final Examination Request or by the deadline established in the Graduate and Professional School Dates and Deadlines Calendar (<https://grad.tamu.edu/knowledge-center/dates-and-deadlines/dates-and-deadlines/>), whichever comes first.

Compliance issues must be addressed if a graduate student is performing research involving human subjects, animals, infectious biohazards and recombinant DNA. A student engaged in these types of research should check with the Office of Research Compliance and Biosafety at 979-458-1467 to address questions about all research compliance responsibilities before the proposal is submitted to the Graduate and Professional School. Additional information can also be obtained on the Office of Research Compliance and Biosafety website (<http://rcb.tamu.edu/>).

Thesis Defense/Final Examination

Students must pass a final examination by dates announced each semester or Summer term in the Graduate and Professional School Calendar (<https://grad.tamu.edu/knowledge-center/dates-and-deadlines/dates-and-deadlines/>). Eligibility to schedule a final examination requires that

- a student's GPA must be at least 3.000 for courses on the degree plan and for all courses completed at Texas A&M which are eligible to be applied to a graduate degree;
- a student may have no unabsolved grades of D, F, or U for any course listed on the degree plan (to absolve a deficient grade, the student must repeat the course at Texas A&M University and achieve a grade of C or better);

- all coursework on the degree plan must be completed, with the exception of those hours for which the student is registered; and
- for thesis option students, an approved thesis proposal must be on file in the Graduate and Professional School according to published deadlines prior to the final examination or submission of the request for exemption from the final examination.

A request to schedule the final examination must be submitted to the Graduate and Professional School *via* ARCS a minimum of 10 working days in advance of the scheduled date for the examination. The Graduate and Professional School will be notified *via* ARCS of any cancellations. A student may be given only one opportunity to repeat the final examination for the master's degree and that must be within a time period that does not extend beyond the end of the next regular semester (Summer terms are excluded).

For thesis option students, the final examination covers the thesis and all work taken on the degree plan and – at the discretion of the student's advisory committee – may be written, or oral, or both. The final examination may not be administered before the thesis is available to all members of the student's advisory committee in substantially final form, and all members have had adequate time to review the document.

The examination is conducted by the student's advisory committee as finally constituted. A thesis option student must be registered at the University in the semester or Summer term in which the final examination is taken. Persons other than members of the graduate faculty may, with mutual consent of the candidate and the advisory committee chair, attend final examinations for advanced degrees. Upon completion of the questioning of the candidate, all visitors must excuse themselves from the proceedings.

Final Examination Grading

The student's advisory committee will conduct this examination. A positive vote by all members of the graduate committee with at most one dissension is required to pass a student on the final examination. If the chair is the sole member of the student's advisory committee, a positive vote – with no dissension – is required to pass a student on the final examination. Departments or interdisciplinary degree programs may have a stricter requirements provided there is consistency within all degree programs within the department or interdisciplinary degree program.

The student's department will promptly report the results of the Final Examination to the Graduate and Professional School *via* the Academic Requirements Completion System (ARCS) within 10 working days of completion of the final examination. If an approved committee member substitution (one only) has been made, their approval must be submitted to the Graduate and Professional School *via* ARCS.

If the program requires the advisory committee to include at least one external member – with an appointment to a department other than the student's major department – and the substitution is for the sole external member of the advisory committee, then the substitute must also be external to the student's major department. In extenuating circumstances, with approval of the Graduate and Professional School, an exception to this requirement may be granted.

A thesis option candidate may petition to be exempt from the final examination provided the degree plan GPA is 3.500 or greater and he/she has the approval of the advisory committee, the head of the student's major department, or intercollegiate chair, if appropriate, and the Graduate and Professional School. It is required that the petition

for exemption be submitted the same semester the student intends to submit the thesis.

Additional Requirements

Additional Requirements

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Residence

On-Campus Degree Program

In partial fulfillment of the residence requirement for the degree of Master of Science, the student must complete 9 resident credit hours during one regular semester or one 10-week summer semester in resident study at Texas A&M University. A minimum of 1 credit hour must be in a non-distance education delivery mode. Semesters during which the student is enrolled in all distance education coursework will not count toward fulfillment of the residence requirement. Upon recommendation of the student's advisory committee, department head or chair of the interdisciplinary program, if appropriate, and with approval of the Graduate and Professional School, a student may be granted exemption from this requirement. Such a petition, however, must be approved prior to the student's registration for the final 9 credit hours of required coursework.

Students who are employed full-time while completing their degree may fulfill total residence requirements by completion of less-than-full time course loads each semester. In order to be considered for this, students are required to submit a Petition for Waivers and Exceptions along with verification of their employment to the Graduate and Professional School.

See Residence Requirements (<https://catalog.tamu.edu/graduate/academic-expectations-general-degree-requirements/#degreerequirementstext>).

Distance Education Degree Program

The distance education modality does not have any residency requirement.

Continuous Registration

On-Campus and Distance Education Degree Programs

A student in the thesis option of the Master of Science program who has completed all coursework on an approved degree plan other than 691 (Research) is required to be in continuous registration until all requirements for the degree have been completed.

See Continuous Registration Requirements (<https://catalog.tamu.edu/graduate/academic-expectations-general-degree-requirements/#registrationandacademicstatustext>).

Time Limit

On-Campus and Distance Education Degree Programs

All degree requirements must be completed within a period of seven consecutive years for the degree to be granted. A course will be considered valid until seven years after the end of the semester in which it is taken. Graduate credit for coursework which is more than seven

calendar years old at the time of the final examination (oral or written) may not be used to satisfy degree requirements.

A student who has chosen the thesis option must have the final corrected copies of the thesis cleared by the Graduate and Professional School within one year of the semester in which the final exam is taken, or a final exam exemption petition was approved. Exams taken in between terms will expire at the end of the term that ended prior to the exam. For example, a final exam taken and passed during the Fall 2022 semester will expire at the end of the Fall 2023 semester. A final exam taken in the time between the Summer and Fall 2022 semesters will expire at the end of the Summer 2023 semester.

Foreign Languages

On-Campus and Distance Education Degree Programs

No specific language requirement exists for the Master of Science degree.

Application for Degree

On-Campus and Distance Education Degree Programs

For information on applying for your degree, please visit the Graduation (<https://catalog.tamu.edu/graduate/academic-expectations-general-degree-requirements/#degreerequirementstext>) section.