

# GEOPHYSICS - 5-YEAR BACHELOR OF SCIENCE AND MASTER OF SCIENCE IN GEOPHYSICS

The combined program in Geophysics is a 5-year path leading to a Bachelor of Science (BS) and a thesis option Master of Science (MS) in Geophysics. This program is designed to quickly prepare exceptional students who would like to either enter into the job market with an advanced degree or apply to PhD programs. Because the MS degree requires a thesis, it is highly recommended that interested students become involved in research project early in the undergraduate career. Areas of opportunity for research at both the undergraduate and MS levels include earthquake mechanisms and seismic wave propagation, theoretical and experimental studies of deformation of rocks and soft sediment, petrophysics and reservoir physics, marine studies of the structure of the oceanic crust and continental margins, near surface applied geophysics and archaeological geophysics.

## Application and Eligibility

- Students may apply for entrance to the graduate program when they reach 90 hours applied to their degree program, normally in the spring of their junior year.
- Applicants to this program are not required to submit GRE, but they must submit two letters of advocacy from faculty members, one of whom is willing to serve as the MS thesis advisor.
- Students admitted into the combined program must finish all of the credit hours to obtain both the Bachelor's and Master's degrees. These students will be conferred with two degrees once they complete all requirements.
- Students not accepted into the combined program will complete the hour Bachelor's degree under the standard 4 year curriculum. These students may still apply to the traditional graduate program.

## Program Requirements

### First Year

Fall		Semester Credit Hours
CHEM 107	General Chemistry for Engineering Students	3
CHEM 117	General Chemistry for Engineering Students Laboratory	1
ENGL 104	Composition and Rhetoric	3
GEOL 150	Introduction to the Solid Earth	4
GEOL 180	Introduction to Geology and Geophysics	1
MATH 151	Engineering Mathematics I	4
<b>Semester Credit Hours</b>		<b>16</b>
Spring		Semester Credit Hours
GEOL 152	History of the Earth	4
MATH 152	Engineering Mathematics II	4
Communication	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication</a> )	3

Government/Political science	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#government-political-science">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#government-political-science</a> )	3
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**Semester Credit Hours 14**

### Second Year

Fall		Semester Credit Hours
GEOL 203	Mineralogy	4
GEOL 210	Geological Communication	3
MATH 251	Engineering Mathematics III	3
PHYS 206	Newtonian Mechanics for Engineering and Science	3
PHYS 226	Physics of Motion Laboratory for the Sciences	1
American history	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history</a> )	3

**Semester Credit Hours 17**

### Spring

GEOL 250	Geological Field Methods	4
GEOL 304	Igneous and Metamorphic Petrology	4
MATH 308	Differential Equations	3
PHYS 207	Electricity and Magnetism for Engineering and Science	3
PHYS 227	Electricity and Magnetism Laboratory for the Sciences (Technical Electives) <sup>2</sup>	1
Technical electives <sup>2</sup>		1

**Semester Credit Hours 16**

### Summer

American history	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history</a> )	3
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**Semester Credit Hours 3**

### Third Year

Fall		Semester Credit Hours
GEOL 306	Sedimentology and Stratigraphy	4
GEOP 341	Fundamentals of Geophysics	3
MATH 311	Topics in Applied Mathematics I	3
PHYS 221	Optics and Thermal Physics	3
Government/Political science	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#government-political-science">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#government-political-science</a> )	3

**Semester Credit Hours 16**

### Spring

GEOL 312	Structural Geology and Tectonics	4
GEOP 313	Geophysical Field Methods	4
GEOP 361	Geophysical Signal Processing	3
Language, philosophy and culture	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture</a> ) <sup>1</sup>	3
Social and behavioral science	( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-science">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-science</a> ) <sup>1</sup>	3

**Semester Credit Hours 17**

<b>Summer</b>		
Technical elective <sup>2</sup>		3
<b>Semester Credit Hours</b>		<b>3</b>
<b>Fourth Year</b>		
<b>Fall</b>		
GEOL 450	Geology Senior Project	3
GEOP 421	Seismology	4
GEOP 413	Near-surface Geophysics	3
Creative arts ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts</a> ) <sup>1</sup>		3
Geophysics elective <sup>3</sup>		3
Technical elective		2
<b>Semester Credit Hours</b>		<b>18</b>
<b>Spring</b>		
Graduate electives <sup>4</sup>		12
<b>Semester Credit Hours</b>		<b>12</b>
<b>Fifth Year</b>		
<b>Fall</b>		
Graduate electives <sup>4</sup>		9
<b>Semester Credit Hours</b>		<b>9</b>
<b>Spring</b>		
Graduate electives <sup>4</sup>		9
<b>Semester Credit Hours</b>		<b>9</b>
<b>Total Semester Credit Hours</b>		<b>150</b>

<sup>1</sup> The Graduation requirements include a requirement for three hours of International and Cultural Diversity courses and three hours of Cultural Discourse courses. A course satisfying a Core category, a college/departmental requirement, or a free elective can be used to satisfy this requirement. See academic advisor.

<sup>2</sup> Any science, math or engineering course that augments the degree with the approval of the advisor. At least four credits should be GEOL 491 Research.

<sup>3</sup> Any Geophysics course.

<sup>4</sup> The MS degree is either Non-Thesis Option (36 total hours, with 6 hours double-counting with the undergraduate Technical Electives) or Thesis Option (32 hours, with 2 hours double-counting with Technical Electives). Graduate courses may be in Geology, Geophysics or a supporting math or science area, chosen with approval of the student's advisory committee. Students in the Thesis Option may include up to 8 hours of Research courses.

The program includes a total of 152 or 156 hours which up to 2 or 6 hours may be applied toward both the Bachelor of Science in Geophysics and the Master of Science in Geophysics.