

# Degree Programs

Missouri S&T offers Bachelor of Science, Bachelor of Arts, Master of Science, Master of Engineering, Doctor of Philosophy, and Doctor of Engineering degrees. You can major in engineering, science, business, or the liberal arts. You can get a background for law or medicine or other professional studies.

In many disciplines there are emphasis areas which are areas of concentration within a degree program. If you choose an emphasis area, you will take some of your elective hours in specified courses in that area. Your advisor can guide you toward the election of courses you should take if you choose an emphasis area.

Degree Programs, Emphasis Areas, and Minors are listed below.

- aerospace engineering
- applied mathematics (emphasis areas in actuarial science, algebra/discrete mathematics, applied analysis, computational mathematics, secondary education, statistics)
- architectural engineering (emphasis in structural engineering, construction engineering and project management, environmental systems for buildings, and construction materials)
- biological sciences (pre-medicine and secondary education)
- business and management systems (emphasis areas in enterprise resource planning, management information systems, e-commerce, finance, human-computer interaction, marketing)
- ceramic engineering
- chemical engineering (emphasis in biochemical engineering)
- chemistry (emphasis areas in biochemistry, polymer and coatings science, pre-medicine chemistry, and secondary education)
- civil engineering (emphasis areas in construction engineering, environmental engineering, geotechnical engineering, materials engineering, structural engineering, transportation engineering, water resources engineering)
- computer engineering (emphasis areas in computers and architecture, integrated circuits and logic design, embedded computer systems, computational intelligence, networking and software engineering, security and reliability)
- computer science
- economics (emphasis area in economics/business and secondary education) (business administration-cooperative program with the University of Missouri-Columbia)
- electrical engineering (emphasis areas in circuits, communications-signal processing, computer engineering, control, electromagnetics, electronics, power,

- engineering management (emphasis areas in industrial engineering, management of technology, manufacturing engineering, packaging engineering, quality engineering)
- English (emphasis area in secondary education)
- environmental engineering
- explosives engineering
- geological engineering (emphasis areas in engineering geology and geotechnics, environmental protection and hazardous waste management, groundwater hydrology and contaminant transport, petroleum, energy and natural resources, and quarry engineering)
- geology & geophysics (emphasis areas in geochemistry, geology, geophysics, groundwater & environmental geochemistry, and petroleum geology)
- history (emphasis area in secondary education)
- information science and technology (emphasis area in human-computer interaction and enterprise resource planning)
- materials, science & engineering
- mechanical engineering (emphasis areas in control systems, energy conversion, environmental systems, instrumentation, manufacturing processes, materials science, mechanical design and analysis, thermal science)
- metallurgical engineering (emphasis areas in chemical metallurgy, manufacturing metallurgy, physical metallurgy)
- mining engineering (emphasis areas in explosives engineering, quarry engineering, coal, mining and the environment, mining health and safety, sustainable development )
- nuclear engineering
- petroleum engineering
- philosophy
- physics (emphasis areas in applied physics, geophysics, and secondary education)
- psychology (emphasis areas in cognitive neuroscience, human services, human resources/personnel, psychology of leadership, usability of technology)
- teacher education program(secondary education certification)
- technical communication

## Minors

You can elect to combine a recognized minor program with your bachelor of arts or bachelor of science degree programs in the following areas:

- aerospace engineering
- american studies
- applied mathematics
- art
- bioinformatics
- biological sciences
- business
- chemistry

- cognitive neuroscience
- communication studies
- computer science
- economics
- energy technology
- engineering management
- enterprise resource planning
- explosives engineering
- film and literature
- finance
- French
- geological engineering
- geology
- German
- global studies
- history
- industrial/organizational psychology
- information science & technology
- international economics
- leadership communication
- literature
- literature and film
- marketing
- materials
- mathematics
- military science
- mineral process engineering
- mining engineering
- multiculturalism & diversity
- music
- nuclear engineering
- petroleum engineering
- philosophy
- physics
- political science
- pre-law
- pre-MBA
- pre-medicine
- psychology
- psychology of leadership
- psychometrics
- Russian
- science, technology & politics
- sociology
- Spanish
- technical communication
- theatre
- writing

**Undergraduate Certificates**

- Explosives Engineering
- Design

# Bachelor of Arts Degree

## General Requirements

This degree can be earned in the following areas: biological sciences, chemistry, economics, English, history, philosophy, and psychology.

A minimum of 120 credit hours is required for a Bachelor of Arts degree with an average of at least two grade points per credit hour to be obtained. At least 45 hours of the student's work must be taken of the upper-class (course numbered 200 or above) level.

Requirements for the Bachelor of Arts degree follow:

### I. Basic Skills and Concepts <sup>(a)</sup>

- A)** Composition: English 20 and one additional three hour composition course<sup>(b)</sup> 6 hrs.
- B)** Western Civilization (History 111 and 112) 6 hrs.
- C)** Foreign languages,<sup>(c)(d)</sup> 12 hours of a single foreign language or 16 hours (8+8) of two foreign languages.
  - 1)** At least three semesters of basic study in a single foreign language or two semesters in each of two foreign languages: French, German, Russian, Spanish, or an approved substitute language.
  - 2)** One year of basic study in one foreign language, either French, German, Russian, Spanish, or an approved substitute, and a humanities or social sciences course taught in a foreign country and employing the language of that country.
  - 3)** One year of basic study in each of two foreign languages; French, German, Russian, Spanish, or an approved substitute language.

### II. General Education Requirements

- A)** Sciences (12 hrs.): At least one course taken in each of the biological (biological sciences), physical (chemistry, geology and geophysics, and physics), and mathematical<sup>(d)</sup>(mathematics/ statistics and computer science) sciences, but not to include Math 1 or Cmp Sc 1. A laboratory also may count – at the discretion of the student's major department – toward the total requirement.
- B)** Humanities (12 hrs.): At least one course in each of the three areas of literature (English and American), philosophy, and fine arts (art, music and theater), but not to include studio and performance offerings. This requirement is exclusive of courses in the student's major field.
- C)** Social Sciences (12 hrs.): Courses in at least two of the following areas: economics, political science, psychology, and sociology. This requirement is exclusive of courses in the student's major field.

### III. Major Field Requirements

- A)** Specific major field requirements in each discipline are given in the entry of that discipline.
- B)** A cumulative grade point average of 2.0 must be earned in all course work taken in the major field. Upper-class (200- and 300-level) courses completed with grades of "D" may not be included in the major field without the approval of the chairman of the department concerned.
- C)** At least nine hours of upper-class work in the major field must be completed in residence at Missouri S&T.

### IV. Minor Field Requirements

- A)** Specific minor field requirements in each discipline are given in the entry of that discipline.
- B)** A cumulative grade point average of 2.0 must be earned in all course work required in the minor field.
- C)** A least six hours of work in the minor field must be completed in residence at Missouri S&T.

### V. Elective Credits

- A)** In consultation with his or her advisor, each student will elect sufficient additional courses to complete a minimum of 120 credit hours.
- B)** Basic ROTC (military science and aerospace studies) may be taken in the freshman and sophomore years. Up to 12 credit hours (depending on the student's major) of advanced courses in ROTC may be credited toward a degree.

### Notes

- <sup>(a)</sup> For transfer students these requirements may be met by equivalent course work completed at other institutions.
- <sup>(b)</sup> This requirement cannot be satisfied with English 10 or 11: English as a Second Language. An entering student may quiz out of English 20: Exposition and Argumentation (3 hrs) on the basis of Advanced Placement standing, through various examinations offered by the College-Level Examinations Program (CLEP subject exams) through the Missouri S&T placement examination program based on Missouri College English Test (MCET) and Cooperative School and College Ability Test (SCAT) scores.
- <sup>(c)</sup> This requirement cannot be satisfied through foreign civilization courses which are taught in English. A student who has studied French or Spanish prior to enrolling in courses at Missouri S&T will be required to take a placement exam that will determine the appropriate course for his/her level of preparation. Students may not enroll in or receive credit for a course taken below their placement level. All course placement requires instructor's approval.

A student may receive foreign language credit by examination with a score of 3,4, or 5 on the language or literature AP exam or with a score in the 75th percentile or above on the CLEP exam.

- <sup>(d)</sup> Upon approval of the department chair students seeking teacher certification may substitute 11-16 hours of certification courses for their foreign language requirement. Students electing to make this substitution must complete the certification program to receive their chosen Bachelors of Arts degree.
- <sup>(e)</sup> The mathematics/statistics requirement may be satisfied by (1) examination or (2) the presentation of 2.5 high school units, including 1.5 units of algebra and excluding general mathematics. The student will not, however, receive hour credit so he or she must take another course to fulfill the 12 hours.

### VI. General Education Communications Requirements

Each department will provide students with opportunities to enhance their writing and speaking skills (beyond the required English 20 class) by requiring that they complete at least two Communications Intensive courses, at least one of which should be in the student's major. Communication Intensive (CI) courses may be focused on writing, speaking, or combinations thereof. Two Communications Emphasized (CE) courses may be used at the equivalent of one CI course (for example, four CE courses would substitute for two CI courses, but an appropriate substitute for the one CI course in the student's major). These requirements will be formally tracked and monitored by the CAPS advising system to ensure that each graduating student is meeting the Communications component of the General Education requirement.

## Bachelor of Science Degree

This degree can be earned in the following areas: aerospace engineering, applied architectural engineering, biological sciences, business and management systems, ceramic engineering, chemical engineering, chemistry, civil engineering, computer engineering, computer science, economics and information science and technology, electrical engineering, engineering management, environmental engineering, geological engineering, geology and geophysics, interdisciplinary engineering, mathematics, mechanical engineering, metallurgical engineering, mining engineering, nuclear engineering, and petroleum engineering, physics, and psychology.

### Accreditation

Missouri S&T bachelor's level engineering programs in the aerospace engineering, applied architectural engineering, ceramic engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, engineering management, geological

## 52— Degree Programs

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engineering, geology and geophysics, mechanical engineering, metallurgical engineering, mining engineering, nuclear engineering, and petroleum engineering, are accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700.

Missouri law requires that all applicants for registration as professional engineers be graduates of engineering programs accredited by the Engineering Accreditation Commission of ABET or possess an education which includes at the minimum a baccalaureate degree in engineering and which, in the opinion of the registration board, equals or exceeds the education received by a graduate of a program accredited by EAC/ABET. Applicants who receive advanced degrees from Missouri S&T engineering programs, but do not have undergraduate engineering degrees, may not be eligible for registration in Missouri. Such applicants may wish to consider studying toward a bachelor's degree in their chosen engineering field. If so they should consult with their department chairman regarding specific requirements. All eligible graduates are strongly encouraged to seek professional engineer registration.

### General Education Communications Requirements

Each department will provide students with opportunities to enhance their writing and speaking skills (beyond the required English 20 class) by requiring that they complete at least two Communications Intensive courses, at least one of which should be in the student's major. Communication Intensive (CI) courses may be focused on writing, speaking, or combinations thereof. Two Communications Emphasized (CE) courses may be used at the equivalent of one CI course (for example, four CE courses would substitute for two CI courses, but two of the CE courses must be in the student's major). These requirements will be formally tracked and monitored by the CAPS advising system to ensure that each graduating student is meeting the Communications component of the General Education requirement.

## Dual Bachelor's Degree

Combination curricula leading to two baccalaureate degrees can be arranged in any two fields. The amount of additional credit required for the second baccalaureate degree will be based on the student's educational background and determined for each case by the academic department which offers the curriculum leading to the second degree. The chair of the department will submit a list of the specific course and credit hour requirements, together with the student's transcript, to the Provost for approval. This list will then be forwarded to the Registrar and constitute the official requirement for the second degree. Since the

B.A. degree is unspecified as to major there will be no dual Bachelor of Arts degree offerings. A student entering Missouri S&T with a baccalaureate degree must take a minimum of 30 hours to receive another bachelor's degree.

When requirements for a degree in two departments have been completed without either degree being awarded, both degrees may be awarded at the same commencement.

## Engineering Degree Requirements

All Engineering degree programs must be consistent with the following minimum requirements.

The requirements of the degree program shall consist of 128-132 credit hours. Additional hours may be required for specific choices of electives or Emphasis Areas. Courses that are at a lower level of coverage than the required courses in the curriculum (e.g. algebra, trigonometry, Intro to Physics, etc.) may not be counted toward the degree program credit hours. An average of at least two grade points per credit hour must be obtained for all credits counted toward the degree. In addition, an average of at least two grade points per credit hour must be obtained for all credits taken in the student's major department.

The degree program shall include all courses in the Common Engineering Freshman Year, as listed in the current catalog under the Freshman Engineering Program.

The degree program shall include a minimum of 21 credit hours as follows:

- English 20
- History 112, 175, 176, or Political Science 90
- Economics 121 or 122
- The remaining courses must be chosen from the list of approved humanities/social sciences courses, published on the website for the Office of Undergraduate Studies ([ugs.mst.edu](http://ugs.mst.edu)). Departments may further specify the requirements for these electives.