

BACHELOR OF ARTS WITH A MAJOR IN APPLIED SCIENCE AND TECHNOLOGY

The Systems Engineering program at GW is designed to provide a broad and solid education in the basics of mathematical modeling, software and information systems, and the treatment of uncertainty. In this program, you learn to apply engineering techniques and mathematical methods to assist decision makers in designing and operating systems optimally. You learn to do this by observing, understanding, modeling, and predicting the behavior of the systems that naturally arise in fields as diverse as medicine, defense, manufacturing, and management. Our students take part in professional societies—such as GW's student chapter of INFORMS (Institute for Operations Research and the Management Sciences)—and have multiple opportunities to connect with our alumni network, leading to internships. With a broad array of options open to systems engineers, our students have gone on to intern as well as start their careers in many fields, including communications, energy, environment, finance, health care, information technology, marketing, national defense, project management, software development, or transportation.

Visit the program website (<http://www.emse.seas.gwu.edu/bachelor-arts-applied-science-technology/>) for additional informational.

ADMISSIONS

For more information on the admission process, please visit the Office of Undergraduate Admissions website (<https://undergraduate.admissions.gwu.edu/>). Applications may be submitted via the Common Application (<https://go.gwu.edu/commonapp/>).

Supporting documents not submitted online should be mailed to:

Office of Undergraduate Admissions
The George Washington University
800 21st Street NW, Suite 100
Washington DC 20052

Contact for questions:
gwadm@gwu.edu or 202-994-6040

REQUIREMENTS

The following requirements must be fulfilled:

A total of 128 credits taken as outlined below.

A minimum technical GPA of 2.20 and SEAS GPA of 2.00. All technical courses taken during the fifth through eighth semesters as outlined by the four-year curriculum sheet respective to each major and approved by the student's faculty advisor are counted towards the student's technical GPA.

Plan of Study

The plan of study lists in sequence all course requirements for the degree. Students should review this information carefully and speak to their advisor before changing the sequence of any of these courses.

| Code | Title | Credits |
|--|--|---------|
| First semester | | |
| CHEM 1111 | General Chemistry I ¹ | |
| EMSE 1001 | Introduction to Systems Engineering | |
| SEAS 1001 | Engineering Orientation | |
| MATH 1231 | Single-Variable Calculus I ¹ | |
| UW 1020 | University Writing ² | |
| Humanities, social science, or non-technical elective ³ | | |
| Second semester | | |
| CHEM 1112 | General Chemistry II ¹ | |
| CSCI 1121 | Introduction to C Programming | |
| or CSCI 1111 | Introduction to Software Development | |
| MATH 1232 | Single-Variable Calculus II ¹ | |
| Humanities, social science, or non-technical elective ³ | | |
| Arts elective ⁴ | | |
| Third semester | | |
| CSCI 1132 | Data Structures and Software Design | |
| or CSCI 1112 | Algorithms and Data Structures | |
| PHYS 1011 | General Physics I ¹ | |
| or PHYS 1021 | University Physics I | |
| Literature elective ⁵ | | |
| Two unrestricted electives ⁶ | | |
| Fourth semester | | |
| APSC 3115 | Engineering Analysis III | |
| EMSE 4410 | Engineering Economic Analysis | |
| PHYS 1012 | General Physics II ¹ | |
| or PHYS 1022 | University Physics II | |
| Literature elective ⁵ | | |
| Unrestricted elective ⁶ | | |

Fifth semester

BISC 1111 Introductory Biology: Cells and Molecules

EMSE 3850 Quantitative Models in Systems Engineering

COMM 1040 Public Communication ¹

or COMM 1041 Interpersonal Communication

or COMM 1042 Business and Professional Speaking

MAE 1004 Engineering Drawing and Computer Graphics

Allied minor elective ⁸

Sixth semester

BISC 1112 Introductory Biology: The Biology of Organisms

ISTM 4121 Database Principles and Applications

Humanities, social science, or non-technical elective ³

Two allied minor electives ⁸

Seventh semester

MAE 3192 Manufacturing Processes and Systems

EMSE 3740W Systems Thinking and Policy Modeling

EMSE 6005 Organizational Behavior for the Engineering Manager

Allied minor elective ⁸

SEAS elective ⁹

Eighth semester

CE 4330W Contracts and Specifications

Allied minor elective ⁸

Humanities, social science, or non-technical elective ³

Three unrestricted electives ⁶

Electives

Students choose electives in specified categories from lists of courses available from the advisor. Allied minor electives are selected, with the approval of the advisor, to form a coherent and meaningful program of 15 credits. Popular selections include biology, communication, computer science, design, economics, engineering, environmental studies, finance, international business, management, mathematics, medical preparation, psychology, statistics, and operations research.

¹Course satisfies the University General Education Requirement (<http://bulletin.gwu.edu/university-regulations/general-education/>) in either mathematics or statistics, natural or physical laboratory sciences, or writing.

²Writing (10 credits). UW 1020 (a required freshman writing course) and COMM 1040, COMM 1041, or COMM 1042. In addition to UW 1020 University Writing, the student's academic program must include two writing-intensive courses to satisfy the GW Writing in the Disciplines (WID) requirement; two such courses are CE 4330W and EMSE 3740W.

³Humanities (6 credits) and social sciences (6 credits). Two two-course sequences selected from the SEAS list of electives in the humanities, social science, or non-technical elective courses (<https://www.seas.gwu.edu/humanities-and-social-science-requirement/>).

⁴Creative and performing arts (3 credits). One of the following: ENGL 1210; CSA 1101, CSA 1201, CSA 1301, or CSA 1501; MUS 1103, MUS 1104, MUS 1107, MUS 1108, or performance study course; PHIL 3162; TRDA 1015, TRDA 1017, TRDA 1025, TRDA 1150, TRDA 1151, TRDA 1152, TRDA 1153, TRDA 1214, or an advanced performance course. Other choices are possible.

⁵Literature (6 credits). One two-course sequence selected from among CHIN 3111 and CHIN 3112; ENGL 2410 and ENGL 2411, ENGL 2510 and ENGL 2511, ENGL 2710 and ENGL 2711, or ENGL 2830 and ENGL 2840; FREN 3210 and FREN 3220; GER 2091 and GER 2092; JAPN 3111 and JAPN 3112; REL 1009 and REL 1010; SLAV 1391 and SLAV 1392; SPAN 3210 and SPAN 3220. Other choices are possible.

⁶Unrestricted (or "free") electives (18 credit). The academic advisor must approve the student's selection of unrestricted electives. If necessary, unrestricted electives may be used to satisfy prerequisite requirements for the allied minor. Such electives also may be used to convert the allied minor into an official minor or second major. Exercise and sport activities courses may not be used as unrestricted electives.

⁷Allied minor (15 credits). The student constructs a coherent program with the assistance of the academic advisor. Popular selections include biology, chemistry, business, communication, design, economics, engineering, environmental studies, finance, international business, management, mathematics, media, medical preparation, physics, psychology, public health, statistics, and operations

research. The allied minor may be part of a second major in CCAS, ESIA, or SEAS, part of the concentration in general business, or part of an official minor.

[science/engineering-management-systems-engineering/dual-ba-applied-science-technology-ms-data-analytics/](http://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/dual-ba-applied-science-technology-ms-data-analytics/)

⁸See the advisor for details.

Humanities, Social Science, and Non-Technical Elective Requirements 4 courses (12 credits)

All APSC majors must take the following two humanities and two social science. Social and behavioral sciences courses must be selected from the University General Education Requirement list (<http://bulletin.gwu.edu/university-regulations/general-education/>); At least one humanities course must be selected from the University General Education Requirement list; the remaining courses must be selected from either the University General Education Requirement list or the H (<https://www.seas.gwu.edu/humanities-and-social-science-requirement/>)umanities, Social Science, and Non-Technical Elective Requirements (<https://www.seas.gwu.edu/humanities-and-social-science-requirement/>) list.

(A) Art Elective 1 course (3 credits)

All Applied Science and Technology

majors must choose one of the

following: ENGL 1210, FA 1014, MUS 1103, MUS 1104, MUS 1107, MUS 1108,

or performance study

course; PHIL 3162; TRDA 1015, TRDA 1025, TRDA 1151, TRDA 1152, TRDA 1153, TRDA 1214,

or an advanced performance course. Other options may be

approved in advance by the Faculty Advisor.

(B) Literature Elective 2 course (6 credits)

All applied science and technology majors must

choose one two-course sequence selected

from among CHIN 3111 and CHIN 3112;

or ENGL 2410 and ENGL 2411; or ENGL 2510 and ENGL 2511;

or ENGL 2710 and ENGL 2711; or FREN 3210 and FREN 3220; GER 2091 and GER 2092;

or JAPN 3111 and JAPN 3112; or REL 1009 and REL 1010;

or SLAV 1391 and SLAV 1392; Other options may be approved

in advance by the Faculty Advisor.

COMBINED PROGRAMS

- Dual Bachelor of Arts with a major in applied science and technology with a Minor in computer science and Master of Science in the field of computer science (<http://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/dual-ba-applied-science-technology-ms-computer-science/>)
- Dual Bachelor of Arts with a major in applied science and technology and Master of Science in the field of cybersecurity in computer science (<http://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/dual-ba-applied-science-technology-ms-cybersecurity/>)
- Dual Bachelor of Arts with a major in applied science and technology and Master of Science in the field of data analytics (<http://bulletin.gwu.edu/engineering-applied->