

ENGINEERING MANAGEMENT AND SYSTEMS ENGINEERING

The multidisciplinary field of systems engineering applies engineering techniques and mathematical methods to improve the planning and decision making in organizational systems composed of people, machines, materials, and procedures. By observing, understanding, modeling, and predicting the behavior of such systems, practitioners of systems engineering assist the decision-making process that seeks to design and operate the systems optimally.

The systems engineering program is designed to provide a broad and solid education in the basics of mathematical modeling, software and information systems, and the treatment of uncertainty. Analytical thinking is stressed, in order to prepare the student for graduate education or productive professional employment. Simultaneously, the program is intended to develop the student's communication skills and awareness of the current professional world. A medical preparation option in systems engineering that prepares the student for entrance to medical school is available. Five-year accelerated programs (<https://www.emse.seas.gwu.edu/5-year-bachelor-science-master-science-degrees/>) that combine a bachelor of science (BS) degree in systems engineering with a master of science (MS) degree in either systems engineering or engineering management are also available.

Visit the program website (<https://www.emse.seas.gwu.edu/bachelor-science-systems-engineering/>) for additional information.

UNDERGRADUATE

Bachelor's programs

- Bachelor of Arts with a major in applied science and technology (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/bs-applied-science-technology/>)
- Bachelor of Science with a major in systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/bs-systems-engineering/>)*

Minors

- Minor in data analytics for decisions (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/data-analytics-for-decisions-minor/>)
- Minor in engineering management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/minor-engineering-management/>)
- Minor in operations research (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/minor-operations-research/>)

- Minor in systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/minor-systems-engineering/>)

*The bachelor of science with a major in systems engineering is accredited by the ABET Engineering Accreditation Commission (EAC).

GRADUATE

Master's programs

- Master of Engineering in the field of artificial intelligence and machine learning (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/artificial-intelligence-and-machine-learning-meng/>) (online)*
- Master of Engineering in the field of cloud computing management (<https://bulletin.gwu.edu/engineering-applied-science/cloud-computing-management-meng/>) (online)*
- Master of Engineering in the field of cybersecurity analytics (<https://bulletin.gwu.edu/engineering-applied-science/cybersecurity-analytics-meng/#text>) (online)*
- Master of Engineering in the field of cybersecurity policy and compliance (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/cybersecurity-policy-and-compliance-meng/#text>) (online)*
- Master of Science in the field of data analytics (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/data-analytics-ms/>) (on-campus)**
- Master of Science in the field of engineering management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/engineering-management-ms/>) (on-campus)
- Master of Science in the field of engineering management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-ms-online/>) (online)
- Master of Science in the field of systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/systems-engineering-ms/>) (on-campus)
- Master of Science in the field of systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/systems-engineering-ms-online/>) (online)

*Not offered on-campus.

**Not offered online.

DOCTORAL

Doctoral program

- Doctor of Engineering in the field of artificial intelligence and machine learning (<https://bulletin.gwu.edu/engineering-applied-science/artificial-intelligence-and-machine-learning-deng/>) (online)
- Doctor of Engineering in the field of engineering management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/doctor-engineering-management/>) (on-campus)
- Doctor of Engineering in the field of engineering management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/doctor-engineering-management-online/>) (online)
- Doctor of Philosophy in the field of engineering management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/phd-engineering-management/>) (on-campus)**
- Doctor of Philosophy in the field of systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/phd-systems-engineering/>) (on-campus)
- Doctor of Philosophy in the field of systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/phd-systems-engineering-online/>) (online)

**Not offered online.

CERTIFICATES

Graduate certificate programs

- Business crisis, continuity, and recovery management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/business-crisis-continuity-recovery-management-certificate/>)
- Emergency management and homeland security (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/energy-management-homeland-security-certificate/>)
- Emergency management and public health (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/emergency-management-public-health-certificate/>)
- Energy systems management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/energy-systems-management-certificate/>)
- Engineering and technology management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/engineering-technology-management/>)
- E ([https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/environmental-](https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/environmental-energy-systems-management-certificate/)

[energy-systems-management-certificate/](https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/energy-systems-management-certificate/))nvironmental and energy systems management

- Systems engineering (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/systems-engineering-certificate/>)
- Systems management (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/systems-management-certificate/>)
- Trustworthy AI for decision making systems (<https://bulletin.gwu.edu/engineering-applied-science/engineering-management-systems-engineering/trustworthy-ai-for-decision-making-systems-certificate/>)

FACULTY

Professors: J.P. Deason, J.R. van Dorp, T.A. Mazzuchi, B. Narahari, S. Sarkani

Associate Professors: H. Abeledo, J.A. Barbera, J.R. Santos, R.A. Francis, Z. Szajnarfarber (*Chair*)

Assistant Professors: D. Broniatowski, E. Gralla, J.P. Helveston, E. Shittu,

Professorial Lecturers: R.M. Andersen, M.J. Armstrong, J.H. Chang, T.H. Holzer Jr., J.V. Shah, J.S. Wasek, R.C. West

COURSES

Explanation of Course Numbers

- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-level undergraduate courses that also may be taken for graduate credit with permission and additional work assigned
- Those in the 6000s and 8000s are for master's, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office
- Applied Sciences (APSC) (<https://bulletin.gwu.edu/courses/apsc/>)
- Engineering Management and Systems Engineering (<https://bulletin.gwu.edu/courses/emse/>)EMSE (<https://bulletin.gwu.edu/courses/emse/>)