

SYSTEMS ENGINEERING

<http://www.seor.gmu.edu/bsse/bsse.html>

Name and description of the field.

Systems Engineering is concerned with the design, production, and maintenance of complex reliable systems within cost and time constraints. Systems Engineering applies an appropriate combination of theories and tools, along with a set of system management procedures to engineer systems of large scale and scope. Activities vary from optimizing complex systems, understanding behavioral factors as they affect the human-machine interaction, designing decision support systems to help managers think strategically and develop and use tools to test the efficiency, maintainability and reliability of complex systems. Concentration areas include control systems, computer network systems, software intensive systems, engineering systems economic systems design and operations research.

What special skills or abilities are needed to succeed in this major?

- An interest in taking the top-down, global view of systems
- An interest in following the design and implementation of systems from requirements to production to maintenance over their whole life cycle
- Good analytical skills
- An orientation toward overall system design, rather than data-led design of individual components.
- The willingness to deal with complex systems that include both people and machines

A B.S. is offered in Systems Engineering at the undergraduate level.

A major in Systems Engineering is also appropriate preparation for graduate work in systems engineering, operations research, telecommunications, transportation, software engineering, and/or information systems. With some additional course work, students could also do related graduate work in areas of computer science, mathematics, or other engineering fields. Another common advanced degree for engineers is that of a Masters of Business Administration (MBA) which greatly strengthens one's management skills and facilitates easier entry into engineering management.

What are recent graduates doing?

According to a recent survey, GMU undergraduates majoring in Systems Engineering are working primarily in systems and software design, engineering, consulting and management. Organizations employing these graduates include large and small technology-driven operations such as defense contractors, computer systems manufacturers, telecommunications companies, transportation companies, and government agencies, health care organizations, insurance companies and consulting firms.

Specific job titles of recent graduates include:

Systems Engineer	Staff Consultant	Network Administrator
Chief Engineer	Systems Analyst/Modeler	Researcher
Software Engineer	Software Analyst	Unix Engineer
Network Analyst	Project Officer, Communications	Aviation specialist

Sample job descriptions:

Systems Engineer - Ask twenty different engineers what a systems engineer does, and you'll get twenty different answers. A systems engineer designs systems that coordinate the efforts of software, hardware, and people in the most efficient manner. A systems engineer might devise a system to alleviate traffic problems on congested highways, develop mathematical models for moving military troops across an ocean, or consult with a business to improve systems of information management and/or development of a complex defense system. In essence, a systems engineer is involved in the design, production, management, and maintenance of reliable systems within cost and time constraints.

For more information on related job descriptions, visit the Career Services Library and pick up a "Where to Start..." bibliography for Systems Engineering majors.

EXPLORING MAJORS

Organizations that typically hire Systems Engineering graduates include:

Systems Resources Corp.	Data Networks Corp.	SAIC, Inc.
Lockheed Martin	Accenture	EDS, Inc.
Northrop Grumman	Universal Systems, Inc.	US Air
Raytheon	Logicon, Inc.	IBM
American Management Systems	Verizon	KPMG, Inc.
System Research & Application Corp.	Litton/PRC	AT & T
CSC Consulting	TRW, Inc.	Department of Defense
Lockheed Martin Federal Systems	Mitretek	Naval Surface Warfare Center
High Performance Technologies Inc.	General Dynamics	BAE Systems

Printed Resources about engineering – <http://careers.gmu.edu/careerlibrary/wheretostart/engr.pdf>

Online Resources – <http://careers.gmu.edu/onlineresources/engr.htm>

Whom should students contact for further information?

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