**THE PROGRAM**

The School of Engineering and Applied Science (SEAS) at Gonzaga University offers traditional four-year Bachelor of Science degrees in Civil Engineering, Computer Engineering, Computer Science, Electrical Engineering, Mechanical Engineering, and Engineering Management.

**Civil engineers** help optimize the design and use of both built and natural environments. A civil engineer plans, designs, and supervises the creation of the infrastructure and environmental solutions required by modern society. Examples of civil engineering projects include bridges, highways, and skyscrapers, as well as networks for water supply, flood control, waste management, and environmental restoration. Civil engineers have roles in design, management, regulatory enforcement, and policy development.

**Computer engineers** are responsible for the design not only of general-purpose computers (PCs through tablets), but also computer technologies embedded in devices like cell phones, appliances, aircraft, and medical equipment. They are also at the cutting edge of new "super" computing technologies, including consideration of energy efficiency in computing design and use of new materials to enhance the capabilities of computer resources. A computer engineer must understand circuitry and micro-electronics, software design, design of the physical hardware, and finally, how to use an operating system to make hardware and software function in sync. As a result, a computer engineering student receives foundational courses required in both electrical engineering and computer science.

**THE PASSION**

Engineers and computer scientists apply knowledge of mathematics, logic, and the natural sciences to develop products and solutions to meet human needs. They are creative problem-solvers. Commercial rockets, skyscrapers, smart phones and their apps, Indy racing cars, satellite communication systems, and consumer goods are all created and designed by skilled and visionary engineers and computer scientists. Students interested in these disciplines must be inquisitive, interested in understanding how things work, and have a desire to develop solutions that address needs. They must also demonstrate a strong aptitude in math and science, excellent communication skills, and a commitment to the highest ethical standards. Gonzaga University engineering and computer science students go beyond the basic theory to application of their disciplines with concern for society and the environment.

**Computer scientists** study computing in all of its forms and across all of its platforms. The impact of computer scientists can be found in PCs, tablets, and iPads, but also in both high-end and consumer technologies. Based on coursework in mathematics, programming languages, design of algorithms, architecture, and theory of computation, graduates of our computer science program commonly go on to graduate studies or enter careers as software engineers, computer scientists, or computational scientists, though many also go on to careers in business and law. The Computer Science major at Gonzaga offers a broad range of advanced computer science topics, such as artificial intelligence, computer graphics, robotics, computer networks, database management systems, cryptography, computer security, and computational linguistics.

**Electrical engineering** traditionally includes specialties in computers, control systems, electrical power, and telecommunications engineering, as well as electro-optics, information theory, signal processing, and image processing. Every time people make phone calls, turn on a light or the TV, or type on a computer, they are using inventions created by electrical engineers. Electrical engineering graduates find employment in many different industries including power utilities, telecommunications, computers, commercial electronics, aerospace, defense, education, government, medicine, and law.

**Mechanical engineering** is a broad field that encompasses activities varying from biomedical research to the design of rocket engines. Mechanical engineers apply the principles of the physical sciences to the production and use of specialized materials, production of energy, the design of machines, and the creation of equipment and systems for manufacturing. Gonzaga’s program emphasizes the thermal sciences and their application to the design and analysis of energy-producing systems. The program makes extensive use of computer-aided design (CAD), computer-aided engineering (CAE), and other computer-based applications.

**Engineering Management** is a program designed to provide students with a broad education and understanding of the practice and concepts of engineering, as well as principles from the business disciplines. Engineering Management is especially well suited for Gonzaga students interested in obtaining a
OUTCOMES
A wide variety of career opportunities await graduating engineers and computer scientists, including employment with large corporations, consulting firms, state agencies, federal agencies, and overseas companies. Our students are also pursuing graduate studies in the technical disciplines, business, and law in increasing numbers. In recent years, the starting salaries for engineers and computer scientists are among the highest offered to all college graduates. These technical degrees are also versatile. Our students often cross over into related fields such as the aerospace, biomedical, and nuclear engineering fields.

RECENT EMPLOYERS INCLUDE:
Amazon  Apple  Avista  Boeing  BPA  Coffman Engineers  EMC  Fast Enterprises  Google  Intel
Microsoft  National Institute of Occupational Safety and Health  Parker Hannifin Corp.  Schweitzer Engineering Laboratories  SpaceX  United Technologies Aerospace Systems  Xylem, Inc.

HIGH SCHOOL PREPARATION
High school students interested in studying engineering need to prepare themselves by taking four years of math, including algebra, geometry, trigonometry, and pre-calculus. Calculus is recommended but not required. In addition, students should take at least three years of science, including physics. Transfer students from two-year or four-year colleges should consult with the School of Engineering and Applied Science regarding transfer credits.

ENGINEERING AT GONZAGA
In the Jesuit tradition, Gonzaga University focuses on all dimensions of a student’s development. In addition to a technical curriculum, our students complete courses in English, speech, religious studies, and philosophy. These courses develop strong communication skills in speaking and writing, while emphasizing critical thinking and ethical reasoning.

In particular, our School focuses on promoting character formation, particularly honesty, tenacity, courage, and citizenship. We encourage students to reflect upon the role of that formation throughout their professional experience. These attributes work together with the Jesuit educational values of ethics, leadership, faith, service, and justice.

Gonzaga’s degree programs in Civil, Computer, Electrical, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET), and the other two programs are in the process of seeking ABET accreditation.

DISTINCTIVE OPPORTUNITIES
Since 2010, sophomores majoring in civil or mechanical engineering at Gonzaga have had the opportunity to study abroad in Florence, Italy during the Spring semester. Gonzaga-in-Florence courses are designed to fit into civil and mechanical engineering students’ existing curricula and requirements. Gonzaga is actively seeking additional study abroad opportunities that will provide similar opportunities designed to fit into all engineering and computer science curricula. Study abroad gives students an opportunity to both experience and work within different international cultures.

True to the Jesuit mission of reaching out in compassion as men and women for others, Gonzaga students and faculty are committed to doing engineering with a purpose. Gonzaga students have traveled to the African nations of Benin, Zambia, and Tanzania to work on challenges involving water supply, waste minimization, safe cook stoves, and provision of refurbished computer equipment. They are also very active in eastern Washington through work on regional Indian lands, tutoring to local K-12 students, and working in local sustainability gardens.

Involvement in student organizations is an important part of academic life at GU for engineering and computer science students. Opportunities include chapters of the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), the American Society of Engineering Management (ASEM), and the Institute of Electrical and Electronic Engineers (IEEE). Additional active groups on campus are the Society of Women Engineers (SWE), the prestigious Tau Beta Pi national honor society, Gonzaga Without Borders, the Society of Automotive Engineers (SAE), the Association for Computing Machinery, and Upsilon Pi Epsilon (UPE), an international honor society for computing and information disciplines.
RECENT GRADUATE PROGRAMS ATTENDED INCLUDE:
Colorado School of Mines
Duke University
Purdue University
Stanford University
University of California, Los Angeles
University of Colorado
University of Florida
University of Notre Dame
University of Southern California
University of Washington
Washington State University

SENIOR PROJECTS
Gonzaga University’s Center for Engineering Design & Entrepreneurship (CEDE) organizes, supports, and advises students undertaking senior capstone projects, commonly defined and funded by sponsors. CEDE projects challenge students to solve real-world problems subject to real-world constraints. Most project teams consist of three to five students, a faculty advisor, and a liaison engineer from the sponsoring company or organization. All projects culminate in a formal presentation of results during the annual Design Exposition Day.

Recent sponsors include Avista, Boeing, the City of Spokane, Coffman Engineers, Eclipse Engineering, Eigen Wireless, FLSmith, Galaxy Compounds, Gray and Osborne, Integris Architecture, Grand Coulee Dam, Haakon Industries, HDR Engineering, Hotstart Inc., Indiana DNR, Kaiser Aluminum – Trentwood Works, KEEN, KRN Services, MSAADA Architects, NIOSH, SCAFCC, Schweitzer Engineering Laboratories, Skils’Kin, Spokane County, the Spokane Tribe of Indians, THr3, Inc., Tate Technologies, United Technologies, the US EPA, and the Washington State Departments of Ecology and Transportation, Engineering Laboratories, and the Washington State Department of Transportation.

THE PLACE
Excellent engineering and computer science programs require up-to-date technology and tools. SEAS enjoys support from both the University and private industry and offers students advanced facilities and lab equipment with the latest technology. Gonzaga students gain valuable research and learning experience. They can study environmental issues, robotics, propulsion, and a host of other fields in the engineering labs at the Herak building and the Gold-level LEED-certified PACCAR building. The CAD/CAE labs provide a fully-networked computer environment where both hardware and software are constantly updated to better support the engineering needs of students and faculty. All engineering students may use the CAD/CAE labs for their coursework, projects, and research. Gonzaga’s engineering and computer science programs have their own lab facilities that provide opportunities for hands-on experiments and research in each field. For more detail on Gonzaga’s engineering labs, please visit: www.gonzaga.edu/engineering-facilities.
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