WHAT CAN I DO WITH A MAJOR IN … MECHANICAL ENGINEERING/ROBOTICS

OCCUPATIONAL SUMMARY:
Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of such equipment as centralized heat, gas, water, and steam systems.

EMPLOYMENT REQUIREMENTS:
Considerable Job Preparation Needed
A bachelor's degree is the minimum formal education required. However, many employers also require graduate school and some require a Ph.D., M.D., or J.D. (law degree).

EMPLOYERS & SUGGESTED STRATEGY:
Please ask your Career Advisor (CDF) for identifying employers or additional resources for your occupation of choice.

Consulting engineering firms - Electronics industry - Equipment Design: Plants, Nuclear power stations - Manufacturing: Consumer products, chemical products, farm equipment, industrial equipment, paper and wood products, textile equipment - Petro-Chemical: Drilling & production, plant operations - Transportation: Automotive industry, aerospace industry, military laboratories - Utilities: Steam driven electric power stations

Suggested Strategy: Obtain related experience through internships or co-op. Take additional courses in area(s) of interest. Develop strong interpersonal and communication skills. Keep pace with technology innovations.

A DAY IN THE LIFE:
Robotics engineers design robots, maintain them, develop new applications for them, and conduct research to expand the potential of robotics. This is a rapidly developing field, with advances in computing constantly opening up new possibilities for robotics applications. Manufacturing, the first industry to invest heavily in robotics, remains the primary employer in the area, but recent years have seen rapid expansion of research and engineering in robots for such applications as agriculture, mining, nuclear power-plant maintenance, and a variety of other fields. The profession offers jobs for a wide range of temperaments. Visionary robotics engineers can work designing experimental mobile robots, with applications ranging from medical and military uses to designs aimed at creating vehicles capable of piloting themselves on other planets. More down-to-earth jobs involve designing new production-line robots, often with programmable arms, and maintaining and upgrading older production-line installations. Somewhere in between lie those engineers designing and producing robots for expanding but tested fields, such as self-piloting crop harvesters and automated nuclear-safety equipment. Robotics engineers must have the same disciplined attention to detail required of all engineers, but the relative novelty of the field puts an additional premium on creativity. It’s a safe bet that twenty years from now, robots will be employed in a vast range of new activities. The engineers who can best anticipate needs which can be successfully filled by robots, and who can work effectively in engineering teams to develop them, will be extremely successful in the field.

PAYING YOUR DUES:
As in most engineering disciplines, graduate education is usually a necessity for advancement in the field. This can range from one to two years of additional master’s in electrical and/or mechanical engineering work for an operating engineer, to several years for the doctorate, which opens up jobs in design and research. The most sought-after jobs go to engineers with academic backgrounds that allow them to combine knowledge in computer science with applied physical sciences. As automated systems must be designed to optimally integrate into the production line, knowledge of the manufacturing environment in which the robot will operate is invaluable.

Tasks
• Read and interpret blueprints, technical drawings, schematics, and computer-generated reports.
• Confer with engineers and other personnel to implement operating procedures, resolve system malfunctions, and provide technical information.
• Research and analyze customer design proposals, specifications, manuals, and other data to evaluate the feasibility, cost, and maintenance requirements of designs or applications.

• Specify system components or direct modification of products to ensure conformance with engineering design and performance specifications.

• Research, design, evaluate, install, operate, and maintain mechanical products, equipment, systems and processes to meet requirements, applying knowledge of engineering principles.

Knowledge

**Engineering and Technology** — Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

**Mechanical** — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

**Design** — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.

**Mathematics** — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

**Production and Processing** — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.

Skills

**Mathematics** — Using mathematics to solve problems.

**Complex Problem Solving** — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

**Critical Thinking** — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Reading Comprehension** — Understanding written sentences and paragraphs in work related documents.

**Science** — Using scientific rules and methods to solve problems.

**Active Listening** — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

**Judgment and Decision Making** — Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Abilities

**Oral Comprehension** — The ability to listen to and understand information and ideas presented through spoken words and sentences.

**Problem Sensitivity** — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

**Written Comprehension** — The ability to read and understand information and ideas presented in writing.

**STATE & NATIONAL WAGES (2007):**

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**STATE & NATIONAL EMPLOYMENT TRENDS:**

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**INFORMATIONAL WEBSITES:**

online.onetcenter.org/  www.acinet.org/  www.princetonreview.com