Industrial Engineering programs\(^1\) teach individuals to apply mathematical and scientific principles to the design, improvement, installation and management of production systems for people, materials, information, and energy. Industrial engineering focuses on people, and the economics and human factors of the production system. Their work is the link between things that people need and their commercial applications. Industrial engineers plan and prepare production schedules and make sure they stay within budgetary limitations and time constraints. They analyze the plant's personnel and capital resources to choose the best way to meet production quotas. You will study applied mathematics, physical sciences, the social sciences, engineering analysis, systems design, computer applications, and forecasting and evaluation methodology.

The program at Montana State University\(^2\) will produce graduates well grounded in both classical and current industrial engineering knowledge and skills consistent with the land-grant mission of MSU. Graduates will be prepared to be productive citizens and contributors to the economic well-being of employers. The IE undergraduate program is fully accredited by the EAC of ABET.

The undergraduate curriculum in Industrial Engineering (IE) includes Mathematics, basic sciences, humanities, social sciences, engineering sciences, design, and communication courses distributed over a four-year period. An important feature of the program is to teach students to foster the ability to comprehend, define, and analyze problems; synthesize alternatives; and rationally choose appropriate solutions. This requires a broad technical education that motivates life-long learning to keep pace with technological and social changes.

Characteristics associated with success\(^1\) in this major include a high level of creativity, logical thinking and problem solving, the ability to work with others in a leadership role, and good written and oral communication skills.

Occupations in this field require the ability to\(^1\):

- Be practical
- Have an analytical mind
- Have a capacity for detail
- Work as part of a team
- Possess good problem-solving skills
- Possess mathematical and scientific aptitude
- Have an ability to work under pressure to meet deadlines
- Be knowledgeable of integrated computer system software
- Be organized and systematic and keep up with changes in their field through continued education

Related occupations include\(^1\):

- Industrial Designer
- Industrial Engineering Technician
- Manufacturing Engineer
- Production Manager (Industry)
- Cost Estimator
- Sales Engineer
- Product-Safety Engineer
- Standards Engineer
- Configuration Management Analyst
- Factory Lay-Out Engineer
- Industrial-Health Engineer
- Liaison Engineer
- Quality Control Engineer
- Time-Study Engineer
- Tool Planner
- Documentation Engineer
MSU graduates (Bachelor’s degree) were hired in the following selected fields:

- Controls Engineer—HP Pelzer Automotive Company
- Data Analyst—Premier Inc.
- Design Engineer—Ironwood Manufacturing
- Engineer—The Boeing Company; Mark Rite Lines Equipment Company
- Field Engineer—Schlumberger
- Industrial Engineer—The Boeing Company; UTAP-Montana Manufacturing Center; NAVSEA; Bosch; Puget Sound Naval Shipyard; Hogin Machine Incorporated
- Inventory—AAR Corporation
- Manufacturing Engineer—Micron Technology, Inc.
- Nuclear Engineer—Puget Sound Naval Shipyard

Salary averages of survey respondents (# of respondents in parentheses):

- 2012: MT: Insufficient Data
- 2011: MT: $30,360 (2) Out of State: $60,125 (4)
- 2010: MT: Insufficient Data
- 2009: MT: $34,000 (1) Out of State: $57,248 (9)

In the field for “Computer Hardware Engineer” the lowest 10% of salaries for 2012 (comparable to new college graduate starting salaries) was $51,200 annually. The median wages in the nation in 2012 was estimated at $78,900 annually. In 2012 there were 223,300 positions nationally with an expected growth forecast of +5% through 2022. In 2012 the lowest 10% of salaries for the state of Montana (comparable to new college graduate starting salaries) was $50,300 annually. The median wages in Montana in 2012 was estimated at $82,200 annually. In 2012 there were 290 positions in Montana with an expected growth forecast of +21% through 2022. Job openings in Montana and nationally are due to both growth and net replacement. Please remember when reviewing the salary information that it is the “median”, meaning 50% of reported wages fell below and 50% above the reported wage.

Other Sources of Information:

International Federation of Professional and Technical Engineers: www.ifpte.org
Society of Women Engineers: http://societyofwomenengineers.swe.org
National Association of Manufacturers: www.nam.org
American Society for Engineering Education: www.asee.org
National Society of Professional Engineers: www.nspe.org
Department of Mechanical & Industrial Engineering - Montana State University: www.coe.montana.edu/mie

*Insufficient Data: Each year the Career, Internship & Student Employment Services Office at Montana State University conducts a survey to determine placement rates and salary survey information from recent MSU graduates. Graduates were requested to participate in the survey to provide relevant information regarding the transition from college to career/graduate school. At times, there are limited or no respondents. Statistics, therefore, are not always based upon the response of the total sample group and are sometimes listed as “Insufficient Data”.

For more information contact:

Montana State University
177 Strand Union Building
Bozeman, MT 59717
(406) 994-4353
www.montana.edu/careers

1University of Oregon. 2007. Created by intoCareers, a unit of the University of Oregon.
2Montana State University Department of Mechanical & Industrial Engineering
3O*Net: online.onetcenter.org
Number of graduates/number of respondents: 2012: 10/5; 2011: 15/7 2010: 6/4; 2009: 18/15