

## Production and Management Systems Emphasis Area

The Production and Management Systems emphasis area focuses on the overall production and distribution of goods and services. The specialization aims to continuously improve material flow in a manner that enhances the quality of the final product and service while reducing the costs to consumers.

Industrial Engineering applications that fall under this emphasis include production planning, scheduling, and control; robotic design and implementation; materials handling, logistics, and storage systems design and control; and facilities location and design. As such, IEs with this focus are found in all sorts of diverse production and supply chain environments all over the world: automotive, electronics, healthcare materials, pharmaceuticals, energy system components, package delivery, etc.

Industrial Engineers with a Production and Management Systems background often are involved with quality control using statistical techniques for productivity improvement. In addition, they frequently use operations research techniques to solve production problems that require an optimal blending of economic, human, and physical resources.

### Production systems specialists have extensive knowledge of

- Six sigma, total quality management, just-in-time
- Facilities design
- Optimization
- Simulation

### Production systems specialists have effective technical skills in

- Programming
- Data manipulation and analysis
- Modeling and problem-solving

### Courses

Courses taken from the following groupings help to provide students with a deeper understanding of production and management systems. More information on each of these courses can be obtained by logging onto [myPurdue](#), navigating to the course catalog page for that department and clicking on the link for the course.

The courses listed below are listed in the course catalog for each department. They are meant to provide guidance as to what a student might take if they are interested in this emphasis area. The list of courses below is not exhaustive. In addition, the regularity of offerings of the listed courses is not guaranteed. Some courses are offered every semester, every other semester, or every other year. Other courses may have been offered at some point, but may not be offered again for a while, and we keep them in this list in hopes they will be offered again. *Therefore, the courses listed here should be considered an unreliable source of information.* A student wishing to take a particular course should always check the course schedule (via "Look Up Classes" in myPurdue) to see what is available.

Legend:

REQ: Required for IE majors

TE: Technical Elective

GE: General Education Elective

\*: Course has not yet been pre-approved by the IE faculty as a TE, but approval is pending. A student may wish to petition for the immediate approval.

**Quality Management and Control**

- IE 530: Quality Control (TE)
- IE 533: Industrial Applications of Statistics (TE)
- MGMT 405: Six Sigma and Quality Management (TE)
- IE 566: Production Management and Control (TE)
- STAT 513: Quality Control (TE)
- STAT 514: Design of Experiments (TE)

**Simulation**

- IE 580: Systems Simulation (TE)
- IE 581: Simulation Design and Analysis (TE)

**Design and Analysis of Production Systems**

- IE 383: Integrated Production Systems I (REQ)
- IE 484: Integrated Production Systems II (TE)
- IE 582: Advanced Facilities Design (TE)
- IE 583: Design and Evaluation of Material Handling Systems (TE)
- IE 590: Material Flow Systems Planning (TE)
- IE 579: Design and Control of Production and Manufacturing Systems (TE)

**Compatible Minors**

- Statistics

**Related Faculty and Staff in IE**

- Abhijit Deshmukh
- Seokcheon Lee
- Shimon Nof
- Jose Tanchoco
- Yuehwern Yih
- Patrick Brunese

**Relevant links**

- [Production and Operation Management Society](#)

**DISCLAIMER:** The emphasis area document is intended for use as an aid to students for developing a coherent curriculum plan. The courses listed are a representation of the courses that may be taken (or are taken as part of the IE curriculum) that develop skills that are needed for a career in a field focusing on this emphasis area. While we list required IE courses, students should strongly consider enhancing their base IE coursework with more advanced courses in one or more of the areas.