

**Required Concentrations for
 Industrial Management Majors only**

Management Information Systems (15cr.)

Successfully complete the following courses

- MGMT 29000** Programming for Business Applications
- MGMT 54400** Database Management Systems
- MGMT 54500** Systems Development
- MGMT 54700** Computer Communications Systems

Successfully complete 1 of the following courses

- MGMT 48800** Electronic Commerce & Information Strategies
- MGMT 59000** Adv. Data Management for Decision Making

Operations & Supply Chain Management (15 credits)

Complete the following courses:

- MGMT 46200** (3cr.) Adv. Manufacturing Planning & Control Systems
or
- MGMT 56000** (2cr.) Manufacturing Planning & Control
- MGMT 49000** (3cr.) Logistics: Concepts & Models

Complete remaining hours in the following courses:

- MGMT 45200** (3cr.) Manufacturing Strategy
- MGMT 56100** (2cr.) Logistics
- MGMT 56200** (2cr.) Project Management
- MGMT 56400** (2cr.) Management of Service Operations
- MGMT 59000** (2cr.) Strategic Sourcing & Purchasing Management

Economics Honors (15 credits)

Students must have a 3.3 in all ECON courses and an overall GPA of 3.3 to pursue ECON Honors.

Complete the following courses:

- ECON 34000** Intermediate Microeconomics Theory
- ECON 35200** Intermediate Macroeconomics
- ECON 36000** Econometrics
- ECON 49900** Senior Honors Thesis (Spring only)
- One **ECON 30000** or **40000** level course

Economics (15 credits)

Complete the following courses:

- ECON 34000** Intermediate Microeconomics Theory
- ECON 35200** Intermediate Macroeconomics
- Three additional **ECON 30000** or **40000** level courses

Notes:

1. To enroll in all MGMT, ECON & OBHR 30000 level or higher courses you must be in upper division
2. A minimum of 15 credit hours is required for the minor.
3. Only one course can be shared between two minors.
4. MGMT, ECON and OBHR courses must be taken at Purdue University, West Lafayette and may not be taken through correspondence or online.
5. IM major professional elective cannot be used from minor courses.
6. The School of Management CANNOT guarantee the offerings of non MGMT, ECON or OBHR courses.
7. Pre/Co-requisites can be found on MyPurdue and the Krannert Undergraduate website.

Manufacturing Management (15 credits)

Complete the following courses:

- MGMT 45200** Manufacturing Strategy
- MGMT 46200** Adv. Manufacturing Planning and Control Systems

Complete 1 of the following courses:

- MGMT 40500** Six Sigma and Quality Management
- OBHR 47000** MGMT of Adv. Manufacturing Organizations

Complete 2 of the following courses:

- MFET 40000** Computer-Integrated Manufacturing
- IE 47700** Work Methods & Measurement
- IE 53000** Quality Control
- MGMT 40500** Six Sigma and Quality Management
- MGMT 49000** Technology Strategy
- MGMT 54400** Database Management Systems
- MGMT 54500** Systems Development
- OBHR 42900** Labor Relations
- OBHR 47000** MGMT of Adv. Manufacturing Organizations

Computer Science (21 credits)

Complete the following courses with a "C" or higher.

All courses require permission from the CS department to enroll: www.cs.purdue.edu/courses/courses.html

Pre-requisite course:

- CS 17700**(4cr) Programming with Multimedia Objects

Complete the following courses:

- CS 18000**(4cr) Problem Solving and Object-Oriented Programming
- CS 18200**(3cr) Foundations of Computer Science
- CS 24000**(3cr) Programming in C
- CS 25000**(4cr) Computer Architecture
- CS 25100**(3cr) Data Structure and Algorithms

Engineering – Industrial Engineering (15 credits)

Complete the following courses:

- IE 47700** Work Methods & Measurement
- IE 53000** Quality Control
- IE 53300** Industrial Applications of Statistics
- IE 54500** Engineering Economic Analysis
- IE 54600** Economic Decisions in Engineering
- IE 55600** Job Design (PSY 55600 cross listed)
- IE 55800** Safety Engineering
- IE 56600** Production Management Control
- IE 57700** Human Factors in Engineering (PSY 57700 cross listed)
- IE 59000** Financial Engineering

Quantitative Methods (15 credits)

Complete the following course:

- MA 26200** Linear Algebra & Differential Equations
- IE 33600** Operations Research-Stochastic Models
- IE 53600** Stochastic Models in Operations Research I
- IE 53700** Discrete Optimization Models & Algorithms
- STAT 51200** Applied Regression Analysis

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Science – Biology (16-21 credits)

Complete 1 of the following sequences (7-8 credits):

Sequence 1:

- BIOL 11000** Fundamentals of Biology I (4cr)
- BIOL 11100** Fundamentals of Biology II (4cr)

Sequence 2:

- BIOL 12100** BIOL I: Diversity, Ecology, & Behavior (2cr)
- BIOL 13100** BIOL II: Develop/Structure/Function of Organisms (3cr)
- BIOL 13500** First Year Biology Lab (2cr)

Complete the following courses:

- BIOL 23100** BIOL III: Cell Structure & Function (3cr)
or **BIOL 23000** Biology of the Living Cell (3cr)
- BIOL 24100** BIOL IV: Genetics & Molecular Biology (3cr)
or **AGRY 32000** Genetics (3cr)

Complete 1 of the following courses: (2-4 credits)

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| BIOL 28600 | BIOL 42000 | BIOL 48100 | BIOL 55900 |
| BIOL 29500 | BIOL 43200 | BIOL 48300 | BIOL 57300 |
| BIOL 30100 | BIOL 43600 | BIOL 49300 | BIOL 58000 |
| BIOL 30200 | BIOL 43800 | BIOL 51100 | BIOL 59200 |
| BIOL 32800 | BIOL 43900 | BIOL 51600 | BIOL 58705 |
| BIOL 36600 | BIOL 44400 | BIOL 51700 | BIOL 59500 |
| BIOL 39500 | BIOL 44600 | BIOL 53700 | BIOL 59700 |
| BIOL 41500 | BIOL 47800 | BIOL 53800 | BIOL 59900 |
| BIOL 41600 | | | |

Complete at least 1 of the following lab courses:

- BIOL 23200** Lab in Cell Structure & Function
- BIOL 24200** Lab in Genetics & Molecular BIOL
- BIOL 30100** Human Anatomy & Physiology
- BIOL 30200** Human Anatomy & Physiology
- BIOL 32800** Principles of Physiology
- BIOL 36600** Developmental Biology
- BIOL 39500** Macromolecules
- AGRY 32100** Genetics Lab

**Science – Earth, Atmospheric & Planetary Sciences
 (17 credits)**

Complete the following courses (7 credit hours):

- EAPS 11100** Physical Geology
- EAPS 22100** or **EAPS 22500** Intro to Atmospheric Science
- EAPS 22500** Science of the Atmosphere
- EAPS 23000** Laboratory in Atmospheric Sciences

Complete 10 additional credit hours in EAPS:

Only one of the additional courses may be at the 10000 level.

All courses for this concentration must be taken at Purdue

Science – Chemistry (16 credits)

Complete 16 hours beyond CHM 11500 and CHM 11600 in additional general chemistry courses.

CHEM 22400, CHEM 25700, and CHEM 33300 cannot be used to fulfill this requirement; 3 credits of CHEM 49900 may be used to fulfill this requirement.

Science – Statistics (15credits)

Complete the following courses:

- STAT 51200** Applied Regression Analysis
- STAT 51300** Statistical Quality Control
- STAT 51400** Design of Experiments

Complete 6 additional credit hours in Statistics – STAT 22500 or MGMT 30500 may not fulfill this minor.

Science – Math (15 credits)

Complete 1 of the following courses:

- MA 26500** Linear Algebra
- MA 35100** Elementary Linear Algebra
- MA 51100** Linear Algebra with Applications

Complete 1 of the following courses:

- MA 34100** Foundations of Analysis
- MA 44000** Real Analysis Honors
- MA 45000** Algebra Honors
- MA 45300** Elements of Algebra

Complete 9 more credits from the following courses:

Analysis area:

- MA 30100** Introduction to Proof through Real Analysis
- MA 34100** Foundations of Analysis
- MA 44000** Real Analysis – Honors
- MA 36200** Topics in Vector Calculus
or **MA 51000** Vector Calculus

MA 42500 Elements of Complex Analysis

or **MA 52500** Introduction to Complex Analysis

Algebra & Discrete Mathematics area:

- MA 37500** Introduction to Discrete Mathematics
- MA 38500** Introduction to Logic
- MA 45300** Elements of Algebra
or **MA 45000** Algebra Honors
- MA 45400** Galois Theory – Honors

Linear Algebra area:

MA 35300 Linear Algebra II

Differential Equations area:

- MA 36600** Ordinary Differential Equations
or **MA 30300** Differential Equations for ENGR and Science
or **MA 30400** Differential Equations & Analysis of Nonlinear Systems for ENGR and Science
- MA 42800** Introduction to Fourier Analysis
- MA 52000** Boundary Value Problems of Differential Equations
- MA 52300** Introduction to Partial Differential Equations

Science – Physics (15 credits)

Complete 1 option from each of the following course sequences:

Sequence 1:

- PHYS 15200 and PHYS 24200** Mechanics (4cr)
Introduction to Heat & Thermal Physics (1cr)
or
PHYS 17200 Modern Mechanics (4cr)

Sequence 2:

- PHYS 24100 and PHYS 25200** Electricity and Optics (4cr)
Electricity and Magnetism Laboratory (1cr)
or
PHYS 27200 Electric and Magnetic Interactions (4cr)

Complete 1 of the following courses:

- PHYS 34200 or PHYS 34400** Modern Physics (3cr)
- PHYS 34400** Modern Physics – Honors (4cr)
- PHYS 34000** Modern Physics Lab (1cr)

Complete 6 additional credit hours at or above the 300 level in Physics.