

# Quantitative Methods & Modeling

## What is Quantitative Methods & Modeling?

This major provides students with the basic preparation needed to pursue careers in the decision sciences. The area also provides fundamental quantitative knowledge required by those who major in other business areas. Quantitative methods and modeling majors will develop interdisciplinary skills that will provide them with the technical versatility required to succeed in today's business environment. Emphasis is placed on modeling methods, analysis, and implementation relevant to operational and management planning issues in many business areas, including marketing, production, finance, accounting, and information technology.

## Occupational opportunities

Opportunities for quantitative methods majors exist in almost every industry because of the diversity of applications for their work. However, opportunities should be especially good in highly competitive industries, such as manufacturing, transportation, telecommunications, and finance. As businesses and government agencies continue to contract out jobs to cut costs, many quantitative methods majors will find opportunities as consultants, either working for a consulting firm or setting up their own practice. A listing of career titles related to this major is listed below.

- Actuary
- Analyst/programmer
- Auditor
- Communications specialist
- Analyst
- Consultant
- Data Communications Analyst
- Data Security Analyst
- Database Manager
- Market Research Analyst
- Distribution Manager
- Market Research Analyst
- Distribution Manager
- End-User Computing Manager
- Financial Planner
- Risk and Insurance Specialist
- Statistician
- Systems Analyst
- Systems Integrator
- Technical Sales Representative
- Underwriter
- Information Systems Developer
- Information Systems Manager
- Information Technology Manager
- Internet Developer
- Internet Marketing Analyst
- Engineering Specialist
- PC Support Specialist
- Inventory Manager
- Investment Analyst
- LAN Manager
- Logistics Manager
- Management Analyst
- Manager/Supervisor
- Materials Controller
- Materials Manager
- Medical Systems Designer
- Mortgage Researcher
- Systems Administrator
- Software Support Technician
- Systems Programmer
- Technology Consultant
- Urban Planner
- Network Administrator/Manager
- Online Services Manager
- Operating Systems Programmer
- Operations Researcher
- Inventory Control Specialist
- Computer Security
- Plant Manager
- Product Development
- Product Forecaster/Estimator
- Production Line Manager
- Production Scheduler/Planner
- Programmer – Engineering & Purchasing Agent/Manager
- Quality Assurance Analyst
- Quality Control Specialist
- Records Management Analyst
- Relocation Analyst
- Risk Analyst
- Software Tester
- Systems Technical Manager
- Telecommunications Manager
- Web Master

## Career Snapshot: Operations Research Analyst

The duties of the operations research analyst vary according to the structure and management philosophy of the employer or client. Some firms centralize operations research in one department; others use operations research in each division. Operations research analysts help determine better ways to coordinate the use of money, materials, equipment and people by applying analytical methods from mathematics, science, and engineering. They solve problems in different ways and propose alternative solutions to management, which then chooses the course of action that best meets the organization's goals. Because computers are the most important tools for performing in-depth

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analysis, training and experience in programming are required. Operations research analysts typically need to be proficient in database collection and management, programming, and the development and use of sophisticated software packages. Beginning analysts usually perform routine work under the supervision of more experienced analysts. As the novices gain experience, they are assigned to more complex tasks and given greater autonomy to design models and solve problems. Operations research analysts advance by assuming positions as technical specialists or supervisors. The skills acquired by operations research analysts are useful for a variety of higher-level management jobs, so experienced analysts may leave the field to assume non-technical managerial or administrative positions. Operations research analysts with significant experience may become consultants, and some may even open their own consulting practice. Operations research analysts generally work regular hours in an office environment. Because they work on projects that are of immediate interest to top management, operations research analysts are often under pressure to meet deadlines and work more than a 40-hour week.

## Skills and Abilities

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The preferred working style for those in Quantitative Methods and Modeling is rational, analytical and detail-oriented. Quantitative Methods careers typically require proficiency in data collection, manipulation and analysis and database management often done with sophisticated computer software programs. Because computers are the most important tools for in-depth analysis, advanced training and experience in computer programming is typically required. High proficiency in mathematics and numerical computation is essential. A list of related skills and abilities follows.

- Ability to cope with constant change
- Ability to analyze, make appropriate decisions, and solve problems
- Ability to think logically
- Ability to organize
- Proficiency in writing and speaking
- Aptitude for abstract reasoning, keen observation, and intense concentration
- Ability to work with others
- High proficiency in the understanding and use of computers
- Proficiency for accuracy and detail
- Computational ability (using algebra for technician areas and using calculus for computer science areas)
- Ability to work under pressure
- Ability to understand and practically apply information derived from technical manuals and related materials

## Additional Resources

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U.S. Government's Occupational Outlook Handbook  
<http://stats.bls.gov/oco>

Association for Information Systems  
[www.aisnet.org](http://www.aisnet.org)

Institute for Operations Research and the Management Sciences  
[www.informs.org](http://www.informs.org)

Institute of Operations Management  
[www.iomnet.org.uk](http://www.iomnet.org.uk)

American Statistical Association  
[www.amstat.org](http://www.amstat.org)

American Mathematical Society  
[www.ams.org](http://www.ams.org)

Society for Industrial and Applied Mathematics  
[www.siam.org](http://www.siam.org)

Institute for the Certification of Computing Professionals  
[www.iccp.org](http://www.iccp.org)

Computing Research Association  
<http://cra.org>

Revised and updated by LS&JM 07/08. Information was obtained from the following sources: The College Board Book of Majors. (2004); The Princeton Review Guide to College Majors (2005 Edition); The College Majors Handbook by N.P. Fogg, P.E. Harrington, & T.F. Harrington (1999 & 2004 Editions); The College Board Guide to 150 Popular College Majors (1992); Vault College Career Bible (2005 Edition); Quick Guide to College Majors & Careers by L. Shatkin (2002).