

Professional Science Master's (PSM) Degree in Industrial Mathematics

Department of Mathematics
University of Northern Iowa
Cedar Falls, IA






What is a PSM Degree?

An innovative graduate degree designed to allow students to pursue advanced training and excel in industry without a Ph.D., while simultaneously developing valuable business skills without an MBA.





What are the major components of a PSM?

- ❖ Technical training in highly relevant, cutting edge, and focused courses in applied mathematics/statistics.
- ❖ Experiential learning via an internship or industrial project.
- ❖ Exposure to business principles and practices.






What are the formal degree options?

Continuous Quality Improvement (CQI) 35 hours

Mathematical Computing & Modeling (MCM) 34 hours

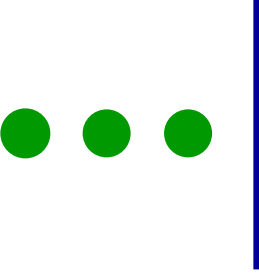
Certificate in Continuous Quality Improvement (CCQI) 17 hours





What are the goals of the CQI track?

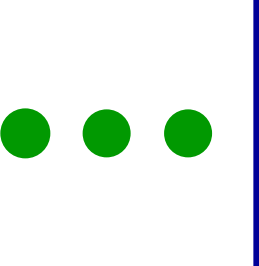
- ❖ Learn how to improve and optimize existing products, processes, and services (**D**efine, **M**easure, **A**nalyze, **I**mprove, **C**ontrol): Six Sigma + Lean.
- ❖ Innovate and develop new products and processes (**D**efine, **M**easure, **A**nalyze, **D**esign, **V**erify): Design for Six Sigma.



What are the goals of the CQI track?

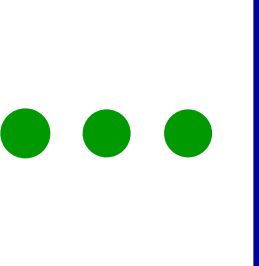
- ❖ Acquire hands-on experience in solving complex industrial problems.
- ❖ Learn the fundamentals of business principles and practices, and their interaction with the technical world.
- ❖ Develop leadership, teamwork, writing, and communication skills.





What are the goals of the MCM track?

- ❖ Gain experience in industrial modeling, design, and simulation.
- ❖ Learn optimization and advanced computing techniques.
- ❖ Acquire hands-on experience in solving complex industrial problems.



What are the goals of the MCM track?

- ❖ Learn the fundamentals of business principles and practices, and their interaction with the technical world.
- ❖ Develop leadership, teamwork, writing, and communication skills.





What are the goals of the Certificate in CQI?

- ❖ To provide academic coursework for the Body of Knowledge (BOK) for ASQ's Six Sigma Black Belt certification and Quality Engineer certification examinations.
- ❖ To meet the needs of students who want expertise in CQI methodology but who do not have time for the 35 hour PSM degree.



PSM in Industrial Mathematics: Business and Experiential Component

Business Management for Science Professionals 3 hours

Project Management for Science Professionals 3 hours

Industrial Internship/Project 6 hours





PSM in Industrial Mathematics: CQI Required Courses

Applied Statistical Methods	3 hours
Statistical Quality Assurance Methods	3 hours
Design and Analysis of Experiments	3 hours
Operations Research Models	3 hours
Seminar in Lean and Six-Sigma Methods in Industry	2 hours
Advanced Statistical Methods	3 hours
Modeling and Simulation of Physical Systems	3 hours





PSM in Industrial Mathematics: MCM Required Courses

Modeling for Industrial Mathematics	3 hours
Geometric Modeling for CAD	3 hours
Advanced CAD and Modeling	3 hours
Linear and Non-Linear Programming	3 hours
Applied Numerical Analysis	3 hours
Modeling and Simulation of Physical Systems	3 hours
Professional Science Master's Seminar	1 hour





Certificate in CQI Courses

Applied Statistical Methods	3 hours
Statistical Quality Assurance Methods	3 hours
Design and Analysis of Experiments	3 hours
Operations Research Models	3 hours
Seminar in Lean and Six-Sigma Methods in Industry	2 hours
Advanced Statistical Methods	3 hours



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For further information, please contact:

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