

Minor in **Automation and CAD/CAM**

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Academic Advisement:

Many professional career positions are in functional areas in which knowledge and skills in automation technology and in computer-aided design and manufacturing are an integral part of the product design and implementation processes. This minor is structured to augment undergraduate studies in engineering and related areas so as to facilitate student opportunities for access to and achievement in these professional career positions. Some students may find it necessary to complete selected prerequisite courses in mathematics, chemistry, physics, and/or engineering.

STUDENT LEARNING OUTCOMES: Students who complete the Minor in Automation and CAD/CAM at California State University, Northridge will demonstrate:

1. an ability to design effective systems and processes for contemporary manufacturing environments;
2. an ability to identify, formulate and solve automation and CAD/CAM problems;
3. a recognition of the need for professional currency;
4. an ability to use contemporary techniques, skills and tools necessary for effective practice;
5. an understanding of the design of products and the equipment, tooling, and environment necessary for their automated manufacture; and
6. an ability to apply advanced methods to the analysis, synthesis and control of automated systems.

These program (i.e. student learning) outcomes for the minor are a focused subset of the program outcomes that are assessed in accord with ABET (Accreditation Board of Engineering and Technology) requirements for the B.S in Manufacturing Systems Engineering.

1. PROGRAM COURSES (9 UNITS)

MSE 248/L Engineering CAD and Graphics	2/1
MSE 410/L Manufacturing Systems Modeling and Lab	2/1
MSE 409/L Fundamentals of Computer-Aided Manufacturing and Lab	2/1

2. ELECTIVE COURSES (9 UNITS)

Each student must complete three elective courses that have been selected with the guidance of a faculty advisor. The courses selected are expected to be consistent with student background and interests, as well as program suitability and coherence. All electives must be approved in advance by the Department.

TOTAL UNITS REQUIRED FOR THE MINOR: 18 UNITS

