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**Transfer Guide for  
UNIVERSITY OF MINNESOTA DULUTH  
ENGINEERING**

**University of Minnesota Duluth Contact:**

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Students may take the first half of a bachelor's degree in engineering at Anoka-Ramsey and then transfer to University of Minnesota Duluth. The University offers three different Engineering majors: Chemical, Electrical & Computer, and Industrial. The Industrial Engineering major offers three different concentrations: Automated Systems, Design for Manufacturing and International Engineering.

**Admission to the major:**

UMD and transfer students must apply for admission at the end of their sophomore year to the upper division of the engineering program in which they are interested. A minimum cumulative GPA, determined by the department, is required in the lower division courses of the chosen engineering program. Transfer students seeking admission into the major should have completed the equivalent lower division courses with the required cumulative GPA. The completed application is evaluated on the basis of GPA, curriculum completed, and space availability. A list of equivalent lower division courses is available in this guide and you may also attain one from the College of Science and Engineering admissions office.

**High School Preparation Requirements:** If you will not have 26 semester transferable credits when you transfer, please see the separate guide for High School Preparation Requirements.

**DESCRIPTION OF THE PROGRAMS**

**Chemical Engineering:**

This four-year baccalaureate (BSChE) degree program emphasizes the development of the student's ability to analyze and design chemical processing systems. By the end of the program, the student must demonstrate the ability to solve engineering problems, a sensitivity to the social and environmental impacts of the engineering profession, and the ability to maintain a high level of competency.

Chemical engineering graduates are qualified for employment in diverse industries, ranging from those that manufacture inorganic chemicals, petrochemicals, plastics, synthetic fibers, paper and pulp, and pharmaceuticals to those that process hazardous and nuclear wastes. Graduates are qualified for assignments that include plant operations, process development, process control, project engineering, or sales, and frequently pursue engineering management later in their careers. They are also well qualified to continue with professional or graduate education.

**Electrical and Computer Engineering:**

Students prepare for a successful career in industry, academia, or government by learning the substance and methods of the electrical and computer engineering discipline including technical, critical thinking, and communication skills. The department provides the opportunity for students to participate fully in the liberal education mission of the University; fosters significant scholarly research for faculty and students; serves the well-being of the community, state, and region through the multi-faceted efforts of our faculty and graduates; and provides the opportunity for students to develop a foundation for life-long learning.

The electrical and computer engineering (BSECE) program combines traditional electrical engineering topics with current computer design and analysis topics. The program is concerned with the theory, design, and application of electrical phenomena and digital computers, including electronic circuits, signal analysis, system design, and computer architecture. The department displays strengths in such diverse areas as electronics, signal processing, electromagnetics, digital computer systems, communications, and controls.

Individual faculty members specialize in areas such as VLSI design, microprocessor systems, image processing, robust control, solid state devices, robotics, instrumentation, neural networks, and fuzzy logic. The program balances theoretical and practical experience in electrical and computer engineering through analysis, synthesis, and experimentation, using facilities that include nine major instructional laboratories and three research laboratories.

**Industrial Engineering:**

The Industrial Engineering program at UMD is designed to develop students' abilities to consider the technical, economic, and human factors involved in the organization and optimization of production. Industrial engineers are proficient in the design, improvement, and production of integrated systems of people, materials, equipment, and energy. The UMD curriculum emphasizes the process of design from the beginning stages of determining customer requirements, all the way through product design, manufacture, delivery, and customer service and support. An industry-based learning experience through an internship, special project, or team design is integral to the senior-year studies.

The program offers three tracks. The **Design for Manufacturing** track emphasizes the design aspects that promote effective manufacturability. **Automated Systems** emphasizes the overall perspective, concentrating on intelligent manufacturing systems; electives allow students to study systems of interest to them. The **International Engineering** track offers a unique opportunity for students to study in Luleå, Sweden.

**COURSE EQUIVALENCY TABLE**

Course Topic	UMD Course	ARCC Equivalent
<b>Engineering Courses</b>		
Introduction to Engineering		ENGR 1100
Engineering Graphics	IE 1225 (Both ENGR 1100 & 1111)	ENGR 1111
Statics	ENGR 2015	ENGR 2241
Dynamics	ENGR 2026	ENGR 2242
Mechanics of Materials	ENGR 2016	ENGR 2243
Engineering Design Graphics	CE 2999A	ENGR 1111
Digital Logic	ECE 1315	ENGR 2218
Linear Circuits I	ECE 2006	ENGR 2219
Digital Fundamentals		ENGR 2221
<b>Math/Computer Science</b>		
Calculus I	MATH 1296	MATH 1400
Calculus II	MATH 1297	MATH 1401
Differential Equations	MATH 3280	MATH 2210
Multivar. Calculus and Vector Analysis	MATH 3298	MATH 2220
Discrete Mathematics	MATH 3355	MATH 2100
Probability and Statistics	STAT 3999A	MATH 2230
Computer Science I	CS 1511	CSCI 1106
Computer Science II	CS 1521	CSCI 1107
JAVA	CS 2121	CSCI 1125
Visual BASIC	CS 1121	CSCI 1115
<b>Science</b>		
Principles of Chemistry I	CHEM 1151	CHEM 1061
Principles of Chemistry II	CHEM 1152	CHEM 1062
Organic Chemistry I	CHEM 2541 & 2543L	CHEM 2061
Organic Chemistry II	CHEM 2542 & 2544L	CHEM 2062
Physics I	PHYS 2011	PHYS 1327
Physics II	PHYS 2012	PHYS 1328

The following ARCC courses are applicable to your chosen major:

### CHEMICAL ENGINEERING

[www.d.umn.edu/che](http://www.d.umn.edu/che)

CHEM 1061, 1062, 2061 (2062 may be taken to apply towards the 8 elective credits within the major)
ENGR 2241, 2243
MATH 1400, 1401, 2210, 2230
PHYS 1327 & 1327L, 1328 & 1328L
CSCI 1106 or 1115 or 1125 or 1133
ENGL 1121

### ELECTRICAL AND COMPUTER

[www.d.umn.edu/ece](http://www.d.umn.edu/ece)

CHEM 1061,
ENGR 2218, 2219, 2241, 2242
MATH 1400, 1401, 2210, 2220 2230
PHYS 1327 & 1327L, 1328 & 1328L
CSCI 1106, 1107
ECON 2206
ENGL 1121

### INDUSTRIAL ENGINEERING

<http://ie.d.umn.edu>

CHEM 1061
ENGR 2219, 2241, 2242, 2243
MATH 1400, 1401, 2210, 2230
PHYS 1327 & 1327L, 1328 & 1328L
CSCI 1106 (Automated Systems also choose CSCI 1107 or 1115 or 1125)
ECON 2205 or 2206
ENGL 1121
For the Automated Systems emphasis students can choose up to 9 elective credits and you may select from the following: CSCI 1107, 1125, MATH 2100, 2220

### **General Education/Liberal Education Requirements:**

While earning an engineering degree it is imperative that you place priority on proper sequencing of your major/technical core classes such as math, physics, chemistry and engineering. General education courses do not need to be completed prior to transferring to UMD, but you may choose to do so. To fulfill the liberal education requirements you may choose to complete the Minnesota Transfer Curriculum (MNTC) or take courses that apply towards UMD's liberal education requirements outlined below. **It is recommended that you follow the liberal education requirements instead of the Minnesota Transfer Curriculum.**

The following page of this document is taken directly from the most recent general transfer guide for the University of Minnesota Duluth dated 11.10.09. You should periodically check for updates.

**Transfer without the Minnesota Transfer Curriculum or an AA Degree:**

Students may apply and if eligible, transfer to UMD without completing the AA degree or the Minnesota Transfer Curriculum. The following are UMD’s liberal education distribution requirements needed to graduate from UMD.

Effective Fall 1999, students planning to graduate from UMD need at least 35 semester credits to fulfill liberal education program requirements. To graduate from UMD, students must complete one course emphasizing cultural diversity in the United States (CD) and one course emphasizing an international perspective in today’s world (IP). On this transfer guide, cultural diversity courses have an \*. International Perspective courses have \*\*. Additionally, if only some, but not all, competencies of the Minnesota Transfer Curriculum have been completed, these competencies will satisfy equivalent competencies at UMD. Contact the UMD representative for further information.

A maximum of 10 credits of Pass-Fail courses may be applied to the liberal education requirements.

**NOTE: additional courses may transfer as distribution requirements. Contact UMD Admissions Representative for further information.**

Distribution Requirements:

<b>Category 1</b> —Composition (one course)	English <b>1121</b>
<b>Category 2</b> —Math, Logic, and Critical Thinking (one course)	GEOG 1501, Math 1100, 1110, 1111, 1201, 1210, 1300, 1310, 1400; PHIL 1101, 1105
<b>Category 3</b> —Communications, Computer Science, and Foreign Languages (one course)	ASL 1101*, 1102*, CHIN 1101, 1102; CSCI 1101, 1115, 1125, 1133, FREN 1101, 1102, 2201, 2202**; GERM 1101, 1102, 2201, 2202**; SPAN 1101, 1102, 2201, 2202**; SPCH 2215, 2220*, SWED 1104, 1105, 1106
<b>Category 4</b> —Physical and Biological Science with lab (one course)	BIOL 1100, 1103**, 1106; CHEM 1020, 1061 (111); GEOG 1103; NATS 1003; PHYS 1007, 1117, 1127
<b>Category 5</b> —Physical and Biological Science without lab (one course) (an additional course from Category 4 may be taken to fulfill this category provided it is from a different department; example: if BIOL 1101 was taken in Category 4, another course could be taken from Category 4 provided it was <u>not</u> a Biology course)	BIOL 1108*; CHEM 1020; HPER 1112; NATS 1001, 1007*; PHYS 1007, 1189
<b>Category 6</b> —The Social Sciences (one course)	ANTH 2201**; ECON 2205, 2206; GEOG 1102*, POLS 1111; PSYC 1110; SOC 1111*
<b>Category 7</b> —Historical and Philosophical Foundations (one course)	ANTH 2202**; HIST 2211, 2221; HUM 2241, 2251, 2261; PHIL 1110**, 1115**; POLS 2245
<b>Category 8</b> —Contemporary Social Issues and Analysis (one course)	BUS 1101, 2215; ECON 1100; GEOG 1106**; GERM 1111**, JOUR 1111; POLS 1131**; SOC 1102*, 2261; SPAN 1111*, WOST 2234*
<b>Category 9</b> —Literary and Artistic Expression: Analysis and Criticism (one course)	ART 1100**, 1107, 1108**, ENGL 2202, 2210**, HUM 1141, 1151, 1161; MUSC 1100*, 1111*; THTR 1101
<b>Category 10</b> —Literacy and Artistic Expression: Performance (one course) (Note: Another course may be taken from Category 9 to fulfill this category, provided it is not from the same department)	HPER 1141, 1143, MUSC 1106, 1108, 1146**; THTR 1109, 2205
PE or Rec courses: maximum of 2 credits of HPER courses may be included in the total liberal education credit requirement, but these courses are not applied to any category)	HPER 1124, 1132, 1133, 1140, 1144, 1146**, 1147, 1148, 1155, 1156, 1157, 1159, 1160, 1161, 1163, 1164, 1165, 1172, 1174, 1175, 1178

\* denotes **Cultural Diversity** course

\*\* denotes **International Perspective** course

If at the time you transfer, your courses are not accepted according to the information on this guide, contact the person/office at your transfer institution listed on the top right hand corner of page one on this guide. If satisfactory resolution does not occur, contact an ARCC counselor for assistance.

NOTE: This information should be used with the catalog of the intended transfer college, not in place of it. Changes in requirements occur periodically, so check with both the transfer college and the Anoka-Ramsey Counseling Center at least once a year for updated information.