

NANOSCIENCE TECHNOLOGY

Nanoscience Technology A.A.S. Degree 72 credits

Major Description

This major prepares students for employment in Minnesota's nanobiotech nanomaterials and nanoelectronics careers. The program is offered through a partnership with the University of Minnesota. Students will take their first three semesters at DCTC and the final semester at the U of M in its Nanofabrication Center, Materials Characterization Lab, and Nanoparticles/Biotechnology Labs.

Nature of Work

The ultra-small scale of nanoscience allows individuals working in the field to apply basic sciences, chemistry, physics and biology to the molecular and atomic world and enter the job market in a variety of areas. Nanoscience technicians work in research, production, marketing, and business environments where nano scale is a part of the industry.

Career Opportunities

"The market for nanotechnology in the United States is rapidly growing and projected to reach \$1 trillion by 2012. Growth over this period is expected to produce between 800,000 and two million new technical jobs." Graduates of this program will be prepared for employment in a multitude of industries with positions in product development, testing, research and development supported and manufacturing design. The need for nanoscience technologists is strong in Minnesota, with over 50 companies using or applying nanoscience technology.

Program Delivery

Courses are offered during the day. Technical courses currently begin in the Fall semester only, however students can begin general education courses any semester. The fourth semester is delivered at the University of Minnesota.

After DCTC

DCTC has transfer agreements for this program with the following colleges: the University of Minnesota– Minneapolis, Southwest Minnesota State University and Saint Mary's University. See Career Services for more information.

Student Outcomes

1. Students will have the knowledge to explain basic scientific principles related to the behavior of matter at the atomic level in chemical, biological, and mechanical systems.
2. Students will demonstrate proficiency in operating state-of-the-art nanofabrication equipment such as scanning electron microscopes and atomic force microscopes.
3. Students will know how to apply the concepts of the nanotechnology related to advanced electronic and the latest nano-level manufacturing technologies.

4. Students will demonstrate the skills necessary to function as a technician in the fields of materials science, electronics and biotechnology applying nanoscience knowledge.
5. Students will demonstrate skills of teamwork, communication, data presentation and understanding.
6. See the General Education outcome statement on page 84 of the college catalog.

Admission Requirements

Applicants to this program must take the ACCUPLACER and achieve a score above the minimum standards in math and reading to be eligible for acceptance into several first semester courses.

Nanoscience Technology – A.A.S. Degree

Courses		Cr
NANO1100	Fundamentals of Nanoscience I	3
NANO1200	Fundamentals of Nanoscience II	3
NANO1210	Computer Simulation	1
NANO2101	Nanoelectronics	3
NANO2111	Nanobiotechnology/Agriculture	3
NANO2121	Nanomaterials	3
NANO2131	Manufacturing Quality Assurance	2
NANO2140	Interdisciplinary Lab	3
NANO2151	Career Planning and Industry Tours	1
NANO2970	Industry Internship & Observation	2
Total		24

Capstone at the University of Minnesota

MT 3111	Elements of Microelectronic Manufacturing	3
MT 3112	Elements of Micro & Nano Manuf. Laboratory	1
MT 3121	Thin Films Deposition	3
MT 3131	Introduction to Materials Characterization	3
MT 3132	Materials Characterization Laboratory	1
MT 3141	Principles & Applications of Bionanotechnology	3
MT 3142	Nanoparticles and Biotechnology Laboratory	1
Total		15

General Education

BIOL1500	General Biology	4
COML1400	Intro to Computers	3
ENGL1100	Writing and Research Skills	3
CHEM1500	Introduction to Chemistry	4
MATS1251	Statistics	4
MATS1300	College Algebra	4
PHYS1100	College Physics I	4
PHYS1200	College Physics II	4
SPEE1020	Interpersonal Communication	3
Total		33

TOTAL Program Requirements 72

6 Steps to a Successful Start

1. **Attend a Tuesday Campus Visit**
12:45-2:30 p.m. every Tuesday, no appointment necessary (evening appointments also available)
651-423-8020
2. **Apply for Admission w/\$20 Fee**
Applications are available on the college Web site (www.dctc.edu) or in Student Services
651-423-8302
3. **Take the ACCUPLACER Test**
Call for an appointment. The ACCUPLACER can be scheduled the same day you come for Tuesday Campus Visit.
651-423-8020
4. **Submit Transcripts**
(If you graduated from high school in the last five years, are transferring college credits, have a previous degree, or have a GED certificate)
651-423-8302
5. **Apply for Financial Aid**
Applications available on www.fafsa.ed.gov.
<http://dctc.edu/go/financialaid>
6. **Register for Classes**
You will then be invited in to a course advising and registration session
651-423-8038

Why DCTC?

Besides our programs and focus on technology, there are plenty of other great reasons for attending DCTC.

Nearly 94% Job Placement

Most of DCTC's students come here with a career goal in mind. And we take great pride in making sure that goal gets accomplished by providing you with the skills that employers are seeking. Year after year, we place more than 94% of our graduates in their field within six months of graduation. And as always, we offer lifetime placement assistance to graduates.

Working with Business

The working world is all about networking, and DCTC is no exception to the rule. With more than 500 local, state and national partnerships, DCTC stays tapped into the latest trends and demands. This has resulted in development of programs such as Railroad Conductor Technology and GM ASEP, which are specifically designed to meet the needs of business and industry.

Instructors who Live It

Our instructors don't just know their stuff – they live it. They have worked extensively in their field and remain active in the industry, bringing their experiences to their classrooms, shops, labs, and studios. And they do more than just teach. They advise and mentor students to help them set goals and achieve them, whether it's finding a new career or advancing in a current one.

Technology Driven

From wireless access, to new science labs and up-to-date computer equipment and software, DCTC recognizes the importance of providing you with the latest technology to best prepare you for your future. Whether you take advantage of online courses or choose to learn at our newly renovated campus, you can be assured that the latest technology is at your fingertips.