

Certificate Programs

In the rapidly evolving world of engineering and computer technology, expanding knowledge is critical to future effectiveness and career advancement. NTU has several master's-level certificates designed for working professionals who want to develop their knowledge and skills in focused areas of graduate study. Each certificate consists of three to five graduate courses. Typically, students can complete a graduate certificate in as little as one year. Most will easily complete these programs within two years. The graduate credits earned as part of the certificate program can also be applied toward a master's degree program, should a student want to continue with their studies. Successful completion of a master's-level certificate does not automatically translate into full NTU graduate admission: admissions requirements for the master's program still need to be met.

NTU maintains a current list of master's-level certificates on its Web site. Since 2003, NTU has launched several graduate certificates, described briefly here and in more depth at www.ntu.edu.

Graduate Certificates

Application Procedure

Students interested in Graduate Certificate programs should go to the "Certificate Programs" link at www.ntu.edu to obtain current information about certificate programs. To apply, students should click the "Apply Now" link and follow the procedures outlined on the resulting screens. General information about registration may also be obtained by emailing registration@ntu.edu.

Upon meeting the requirements for a certificate, a student should submit an electronic request for a certificate, indicating courses taken and grades received. NTU will verify the information and issue certificates quarterly (February, May, August, and November). An entry will be made on the student's transcript, and the certificate will be sent to the student's home address.

Requirements

To receive a certificate, students must fulfill the following requirements:

- Complete the required NTU graduate courses for the certificate.

- Receive a *B* or better in each course. (A grade of *B-* cannot be counted toward a certificate.)

Master's-Level Certificates

NTU maintains a current list of available certificates on its Web site at www.ntu.edu. Listed below are some of the master's-level certificates and their required courses:

Project Management

TO 760-CU	Project Management Systems
TO 761-CU	Advanced Topics in Project Management
EF 710-NJ	Concepts of Strategic Cost Analysis
SY 563-N	Integrated Risk Management

Systems Engineering

SY 560-N	Systems Engineering Management
SY 710-E	The Systems Engineering Process
SY 711-E	Model-Based System Design

One of the following courses:

SY 721-U	Applied Systems Engineering
SY 750-N	Systems Reliability Engineering
SY 562-N	Systems Integration and Test

Software Project Management

Four of the following courses:

SE 762-N	Software Measurement and Quality Engineering
SE 770-R	Software Specification
SE 555-A	Software Engineering: Analysis and Evaluation
SE 584-N	Software Project Planning and Management
SE 785-SC	Software Management and Economics

Object-Oriented Programming

SE 531-N	Advanced Java Programming
SE 730-D	Object-Oriented Analysis and Design
SE 754-NT	Object-Oriented Testing and Reliability
SE 540-N	Java Distributed Enterprise Computing

Certificates of Completion

In addition to the pre-configured certificates above, NTU offers a Certificate of Completion program that allows students, in concert with their advisors, to configure their own course sequences. The NTU Certificate of Completion program is designed to recognize the achievements of students whose courses meet specific needs of their individual careers. This program is especially beneficial to those who already have a master's or doctoral degree and do not want to pursue another advanced degree. It provides recognition of academic accomplishment while upgrading technical competence or reorienting professional careers.

Students who satisfy the requirements receive a Certificate of Completion and a permanent record on their NTU transcript.

Students may take advantage of this program to earn one or more Certificates of Completion. A course may be used only once for certificate purposes; however, the same course may also be applied toward a master's degree. Foundation courses are not accepted for a certificate.

Application Procedure

Students interested in a Certificate of Completion program should contact an NTU advisor (advisor@ntu.edu). Students will be asked to submit a brief proposal describing their specific needs for a certificate, listing the set of courses they intend to use toward the certificate, and explaining how those courses form a coherent program that addresses their needs.

Upon meeting the requirements for a certificate, a student should submit an electronic request for a certificate, indicating courses taken and grades received. NTU will verify the information and issue certificates quarterly (February, May, August, and November). An entry will be made on the student's transcript, and the certificate will be sent to the student's home address.

Requirements

To receive a certificate, students must fulfill the following requirements:

- Complete at least four NTU graduate courses for a minimum of 10 semester credits.
 - Three courses in one specific area of specialization (e.g., AD, CA, ME, or a sub-area of these.)
 - One additional course in the same area or in a supportive area of specialization.
- Receive a *B* or better in each course. (A grade of *B-* cannot be counted toward a certificate.)

Specialty Areas

The following is a list of the specialization-area designations that are available through NTU:

AD	Algorithms and Data Structures
AE	Aerospace Engineering
CA	Computer Architecture
CC	Communications
CH	Chemical Engineering
CM	Computational Methods and Theory
CR	Circuit Theory
CS	Computer Software
CT	Control Theory
DS	Digital Systems

EA	Emerging Areas
EF	Economics and Finance
EM	Electromagnetics
EP	Electrical Properties
ES	Engineering Science
EV	Environmental Systems Management
IC	Integrated Circuits
IS	Intelligent Systems
MA	Mathematics
MB	Management and Behavioral Science
MC	Materials Characterization
ME	Mechanical Engineering
MG	Business and Administration
MP	Mechanical Properties
MS	Materials Science
NB	MBA Core Subject Areas
PD	Product and Process Design
PM	Polymeric Materials
PS	Power Systems
QM	Quantitative Methods
SE	Software Engineering
SP	Manufacturing Systems Planning and Control
ST	Software Techniques
SY	Systems Engineering
TC	Telecommunications
TO	Technical Operations

Sample Certificate of Completion Programs

Listed below are some sample course choices for Certificate of Completion programs:

Computer Architecture

CA 720	Digital Computer Design
CA 726	VLSI Architecture
CA 760	Embedded Computer Systems
CT 712	Linear Systems Theory

Semiconductor Engineering

IC 701	Electronic Packaging Principles
IC 506	Microelectronic Reliability
IC 724	Solid-State Devices
IC 730	Advanced Microelectronic Processing

Software Engineering

SE 742	Software Generation and Maintenance
SE 750	Software Testing and Verification
SE 770	Software Specification
SE 783	Software Management

Quality Control and Reliability

TO 570	Industrial Quality Control
TO 771	Reliability Engineering
TO 772	Maintainability Engineering
TO 775	Advanced Management of Quality

Computer Science Fast-Track Certificate Program

NTU offers an accelerated academic program of six undergraduate computer science courses designed to help students stay on track in their careers. The fast-track program provides focused, in-depth courses that offer core computer science knowledge to help students transition into computer science or software engineering.

Instructors have condensed course material to specifically meet the needs of students working in high-tech fields. Each course is 1.6 credits and is offered for audit or pass/fail only. Course notes are provided as well as optional homework assignments and exams. A teaching assistant is available via email and phone to answer questions and help with assignments.

Fast-Track Courses

- FT 001-NT Computer Organization
- FT 002-NT Algorithms and Data Structures
- FT 003-NT Computer Programming Languages
- FT 004-NT Foundations of Computer Sciences: Formal Languages and Automata
- FT 005-NT Software Engineering
- FT 006-NT Operating Systems

NTU does not grant academic credit for these courses. Students are not required to take all six courses, but students who complete the six-course series will earn a Certificate of Completion in Principles of Computer Science.