

Graduate Student Handbook for the

Master of Science in Industrial Technology

North Carolina A&T State University
Master of Science in Industrial Technology

North Carolina A&T State University

Information Technology Concentration

with specializations in:

**Computer Technology
Telecommunications Technology**

Electronics and Computer Technology Concentration

with specializations in:

**Computer Information Technology
Telecommunications Technology
Microelectronics and Materials Technology
Controls and Systems Technology**

Master of Science in Industrial Technology
Department of Electronics, Computer, and Information Technology
North Carolina A&T State University

Purpose

This handbook will provide specific departmental information for students of the Electronics, Computer and Information Technology Department. It is meant to be supplemental to the University's Bulletin, and the University's Student Handbook. Thus, students of the department should use obtain copies of both handbooks as well as the University Bulletin. The student should also keep informed of changes in policies and procedures that may take place after the handbooks and University's Bulletin have been updated. Your student advisor or department chair is a good source of updated departmental information.

Program Description

The School of Technology at North Carolina A&T State University offers a Master of Science in Industrial Technology (MSIT) degree. This program is coordinated by the Department of Manufacturing Systems and is designed to increase students' understanding of industrial management challenges in an array of technical areas and to explore effective methods for dealing with accelerated technological change.

Areas of Concentration

The MSIT degree program has six areas of Technical Concentrations. The student program of study determines the area of concentration. The difference in each concentration will be in the area of Management Electives and Technical Electives. **Note: Each student should consult with an advisor in the department of interest to develop a program of study**

The six Concentration areas are:

1. Manufacturing Systems
2. Electronics and Computer Technology
3. Graphic Communication Systems
4. Construction Management

5. Occupational Safety and Health
6. Information Technology

Admission Requirements

The Master of Science in Industrial Technology, within the School of Technology, requires the GRE General Test as part of the admission process. No minimum score is required at this time. Please contact the Graduate School Office for more information.

Program Objectives

The MSIT degree program is built upon the competencies achieved at the baccalaureate level in the industrial technology curriculum and thus enable students to secure applications oriented "technical-management" positions in today's industrial environment. Specifically, this program is designed to prepare technical-management professional and enhance their proficiencies in the following areas:

1. planning, organizing and management of technology, people, and resources;
2. applying and controlling the use of various high technologies (e.g., computer aided-drafting and design (CADD), computer-integrated manufacturing (CIM), machine vision and photonics, telecommunications and wireless communications, computerized construction estimating systems, safety support systems, etc.);
3. control processes to improve quality, reliability, and productivity
4. Human resource management and the development of a changing workplace to achieve organizational goals; and
5. problem solving and creative thinking skills.

Target Audience and Career Opportunities

This program is designed to serve the diverse needs of persons who are interested in pursuing careers in technology. Included in this group are the following:

1. persons currently employed in industrial management positions and have professional growth aspirations;

2. individuals recently completing their undergraduate study and want additional preparation prior to embarking on a career in industry; and
3. students interested in entering an advanced graduate degree program (Ph.D., Ed.D, etc.) and whose ultimate goal is university teaching and/or research. Graduates of the program should be able to perform more creatively and competently in leadership roles involving planning, problem solving, and decision-making. Additionally, the program is designed to enhance student competencies in the areas of research and scholarly writing.

The Electronics, Computer, and Information Technology Department is focus on providing students with an opportunity to acquire a high degree of proficiency in the field of technology, supported by competence in mathematics, the basic sciences, and technological principles that will be needed to function effectively as an Electronics Technologist.

Currently there are two graduate concentrations supported by the department:

- Information Technology
- Electronics and Computer Technology
- And a Certificate Program in Radio Frequency & Microwave Wireless Communication Systems

The Master of Science in Industrial Technology in Electronics and Computer Technology program is designed to prepare individuals to work in the broad fields of electronics, communications, information technology, automatic controls, robotics, computer technology, and power systems.

The Master of Science in Industrial Technology with a concentration in Information Technology is a program that aims to meet existing and emerging needs of the information technology industry by educating new IT workers in current principles and practices in information technology and their applications. The IT applications may include Information Systems, Telecommunications, Network Administration, Web Development, Computer Graphics, and Information Security. Courses are designed to not only give you a solid knowledge of the field but also to prepare you to take industry-standard certification exams such as the CompTIA's A+, i-Net+, Network+, Server+, Linux+ and IT Project+; the Certified Wireless Network Professional

(CWNP)'s Certified Wireless Network Administrator (CWNA), Certified Wireless Security Professional (CWSP), Certified Wireless Analysis Professional (CWAP), Certified Wireless Networking Expert (CWNE) and more.

What is a Technologist?

The rapid growth of technology in our society has been sustained by the efforts of a technological team of professionals. The technologist is a key member of that team who is responsible for applying the research, analysis and design of his colleagues the scientist and the engineer. Technologists also supervise technicians who are involved in fabricating, operating, testing, troubleshooting and maintaining equipment and systems.

A possible scenario could be described as follows: A scientist conducts basic research to explore and develop fundamental theories, an engineer uses these theories to design and develop products and systems. The design concept is then given to a technologist who has the responsibility for transforming the concept into a prototype or product. The device is then passed to a technician who is responsible for testing it to confirm the specifications or operation as originally designed. In actual practice, the interaction among members may vary considerably.

Typically, a technologist will have completed a bachelor's level degree in a field of technology, such as Electronics Technology. Employment opportunities include design operations, sales, technical management and project management. Graduates of Bachelor of Science degree programs in Technology are called technologists to distinguish them from graduates of Bachelor of Science degree programs in Engineering. However, the National Bureau of Labor Statistics does not presently have a category called "Technologist", consequently, many industrial job titles show little distinction between technologists and engineers. Graduates of technology and engineering programs complement each other in their skills and interests. Together with scientists and technicians, they form a technological team, which has been able to produce an ever-increasing rate of technological advancement.

Your hard work as a technology student will prepare you for a wide range of exciting opportunities throughout the nation and world. We encourage you to take full advantage of all the resources available to you to help you to become all that you can be.

MASTER OF SCIENCE IN INDUSTRIAL TECHNOLOGY
Concentration in Information Technology
(Coursework Option)

A total of 42 hours is required for a Master of Science in Industrial Technology (coursework option). The total consists of 12 credits of **Core Courses**; also 6 credits of **Management Electives**, 3 credit of **Statistics Requirement**, 21 credits of **Technical Electives**, and 0 credits of a **Required Comprehensive Examination Course**.

Core Courses
(12 credit)

3 hrs	Problem Solving in Industrial Technology	MSIT 610
3 hrs	Concepts of Technological Innovations	MSIT 700
3 hrs	Leadership Development Seminar	MSIT 740
3 hrs	Statistical and Research Methods in Industrial Technology I	MSIT 779

Management Electives- Information Technology
(6 credit)

3 hrs	Telecommunications Management	ITT 620
3 hrs	Systems Integration for Telecommunications Managers	ECT 730
3 hrs	Telecommunications Management Issues	ECT 735
3 hrs	Regulatory and Policy Issues for Communication Systems	ITT 740

Statistics Requirement- Information Technology

(Student can select a 3 credit second semester statistics course from any NCA&TSU department with prior approval)

3 hrs	Statistical and Research Methods in Industrial Technology II	MSIT 780
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Technical Electives- Information Technology

(Student is to select 21 credits of technical electives course from any SOT department or with prior approval, any NCA&TSU department)

Computer Technology Specialization

3hrs	Computer Networking I	ITT 629
3 hrs	Computer Networking II	ITT 630
3 hrs	Wide Area Networks	ITT 725
3 hrs	Network Services for the Enterprise	ITT 745
3 hrs	E-commerce Design and Implementation	BUED 624
3 hrs	Information, Privacy and Security	COMP 620
3 hrs	Wireless Network Security	COMP 627
3 hrs	Programming in BASIC	CUIN 760
3 hrs	Programming in LOGO	CUIN 761
3 hrs	Graphic Animation	GCS 632
3 hrs	Information Systems	INEN 625

Telecommunications Technology Specialization

3 hrs	Wireless Application Protocols I	ITT 601
3 hrs	Digital Communications I	ITT 610
3 hrs	Digital Communications II	ITT 611
3 hrs	Wireless Communication Systems I	ITT 650
3 hrs	Optical Communication Systems I	ITT 655
3 hrs	Satellite and Personal Communication Systems	ITT 660
3 hrs	Wireless Geo-location Systems I	ITT 665
3 hrs	Communication Circuit Development Laboratory I	ITT 670
3 hrs	Video Communication Systems	ITT 675
3 hrs	Radio Wave and Optical Signal Propagation	ITT 680
3 hrs	Optical Communication Systems II	ITT 755
3 hrs	Wireless Communication Systems II	ITT 760
3 hrs	Wireless Geo-location Systems II	ITT 765
3 hrs	Communication Circuit Development Laboratory II	ITT 770

Required Comprehensive Examination Course

0 hrs	Masters Comprehensive Examination	MSIT 777
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MASTER OF SCIENCE IN INDUSTRIAL TECHNOLOGY
Concentration in Information Technology
(Project Option)

A total of 39 hours is required for a Master of Science in Industrial Technology (project option). The total consists of 12 credits of **Core Courses**; also 6 credits of **Management Electives**, 3 credit of **Statistics Requirement**, 9 credits of **Technical Electives**, 0 credits of a **Required Comprehensive Examination Course** and 9 credits of **Required Courses**.

Core Courses
(12 credit)

3 hrs	Problem Solving in Industrial Technology	MSIT 610
3 hrs	Concepts of Technological Innovations	MSIT 700
3 hrs	Leadership Development Seminar	MSIT 740
3 hrs	Statistical and Research Methods in Industrial Technology I	MSIT 779

Management Electives- Information Technology
(6 credit)

3 hrs	Telecommunications Management	ITT 620
3 hrs	Systems Integration for Telecommunications Managers	ECT 730
3 hrs	Telecommunications Management Issues	ECT 735
3 hrs	Regulatory and Policy Issues for Communication Systems	ITT 740

Statistics Requirement- Information Technology

(Student can select a 3 credit second semester statistics course from any NCA&TSU department with prior approval)

3 hrs	Statistical and Research Methods in Industrial Technology II	MSIT 780
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Technical Electives- Information Technology

(Student is to select 9 credit of Technical Electives course from any SOT department or with prior approval, any NCA&TSU department)

Computer Technology Specialization

3hrs	Computer Networking I	ITT 629
3 hrs	Computer Networking II	ITT 630
3 hrs	Wide Area Networks	ITT 725
3 hrs	Network Services for the Enterprise	ITT 745
3 hrs	E-commerce Design and Implementation	BUED 624
3 hrs	Information, Privacy and Security	COMP 620
3 hrs	Wireless Network Security	COMP 627
3 hrs	Programming in BASIC	CUIN 760
3 hrs	Programming in LOGO	CUIN 761
3 hrs	Graphic Animation	GCS 632
3 hrs	Information Systems	INEN 625

Telecommunications Technology Specialization

3 hrs	Wireless Application Protocols I	ITT 601
3 hrs	Digital Communications I	ITT 610
3 hrs	Digital Communications II	ITT 611
3 hrs	Wireless Communication Systems I	ITT 650
3 hrs	Optical Communication Systems I	ITT 655
3 hrs	Satellite and Personal Communication Systems	ITT 660
3 hrs	Wireless Geo-location Systems I	ITT 665
3 hrs	Communication Circuit Development Laboratory I	ITT 670
3 hrs	Video Communication Systems	ITT 675
3 hrs	Radio Wave and Optical Signal Propagation	ITT 680
3 hrs	Optical Communication Systems II	ITT 755
3 hrs	Wireless Communication Systems II	ITT 760
3 hrs	Wireless Geo-location Systems II	ITT 765
3 hrs	Communication Circuit Development Laboratory II	ITT 770

Required Comprehensive Examination Course

0 hrs	Masters Comprehensive Examination	MSIT 777
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Required Courses
(9 credit Project Option)

Project Option:

3 hrs Internship I or Telecommunications Co-op
3 hrs Internship II
3 hrs Master's Project

MSIT 750 or ECT 750
MSIT 751
MSIT 789

MASTER OF SCIENCE IN INDUSTRIAL TECHNOLOGY
Concentration in Information Technology
(Thesis Option)

A total of 36 hours is required for a Master of Science in Industrial Technology (thesis option). The total consists of 12 credits of **Core Courses**; also 6 credits of **Management Electives**, 9 credits of **Technical Electives**, 0 credits of a **Required Comprehensive Examination Course** and 9 credits of **Required Courses**.

Core Courses
(12 credit)

3 hrs	Problem Solving in Industrial Technology	MSIT 610
3 hrs	Concepts of Technological Innovations	MSIT 700
3 hrs	Leadership Development Seminar	MSIT 740
3 hrs	Statistical and Research Methods in Industrial Technology I	MSIT 779

Management Electives- Information Technology
(6 credit)

3 hrs	Telecommunications Management	ITT 620
3 hrs	Systems Integration for Telecommunications Managers	ECT 730
3 hrs	Telecommunications Management Issues	ECT 735
3 hrs	Regulatory and Policy Issues for Communication Systems	ITT 740

Technical Electives- Information Technology

(Student is to select 9 credit of Technical Electives course from any SOT department or with prior approval, any NCA&TSU department)

Computer Technology Specialization

3hrs	Computer Networking I	ITT 629
3 hrs	Computer Networking II	ITT 630
3 hrs	Wide Area Networks	ITT 725
3 hrs	Network Services for the Enterprise	ITT 745
3 hrs	E-commerce Design and Implementation	BUED 624
3 hrs	Information, Privacy and Security	COMP 620
3 hrs	Wireless Network Security	COMP 627
3 hrs	Programming in BASIC	CUIN 760
3 hrs	Programming in LOGO	CUIN 761
3 hrs	Graphic Animation	GCS 632
3 hrs	Information Systems	INEN 625

Telecommunications Technology Specialization

3 hrs	Wireless Application Protocols I	ITT 601
3 hrs	Digital Communications I	ITT 610
3 hrs	Digital Communications II	ITT 611
3 hrs	Wireless Communication Systems I	ITT 650
3 hrs	Optical Communication Systems I	ITT 655
3 hrs	Satellite and Personal Communication Systems	ITT 660
3 hrs	Wireless Geo-location Systems I	ITT 665
3 hrs	Communication Circuit Development Laboratory I	ITT 670
3 hrs	Video Communication Systems	ITT 675
3 hrs	Radio Wave and Optical Signal Propagation	ITT 680
3 hrs	Optical Communication Systems II	ITT 755
3 hrs	Wireless Communication Systems II	ITT 760
3 hrs	Wireless Geo-location Systems II	ITT 765
3 hrs	Communication Circuit Development Laboratory II	ITT 770

Required Comprehensive Examination Course

0 hrs	Masters Comprehensive Examination	MSIT 777
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Required Courses
(9 credit Thesis Option)

Thesis Option:		
3 hrs	Statistical and Research Methods in Industrial Technology II	MSIT 780

3 hrs Research for Master's Thesis I
3 hrs Research for Master's Thesis II

MSIT 791
MSIT 792

MASTER OF SCIENCE IN INDUSTRIAL TECHNOLOGY
Concentration in Electronics and Computer Technology
(Coursework Option)

A total of 42 hours is required for a Master of Science in Industrial Technology (coursework option). The total consists of 12 credits of **Core Courses**; also 6 credits of **Management Electives**, 24 credits of **Technical Electives**, and 0 credits of a **Required Comprehensive Examination Course**.

Core Courses
(12 credit)

3 hrs	Problem Solving in Industrial Technology	MSIT 610
3 hrs	Concepts of Technological Innovations	MSIT 700
3 hrs	Leadership Development Seminar	MSIT 740
3 hrs	Statistical and Research Methods in Industrial Technology I	MSIT 779

Management Electives-Electronics and Computer Technology
(6 credit)

3 hrs	Telecommunications Management	ITT 620
3 hrs	Systems Integration for Telecommunications Managers	ECT 730
3 hrs	Telecommunications Management Issues	ECT 735
3 hrs	Regulatory and Policy Issues for Communication Systems	ITT 740
3 hrs	Electric Energy and Environmental Management	ECT 785

Technical Electives-Electronics and Computer Technology

(The student is to select 24 credits of technical elective courses from any SOT department or with prior approval, any NCA&TSU department)

General Technology Specialization

3 hrs	Energy, Power and The Environment	ECT 685
3 hrs	Special Problems in Electronics and Computer Technology	ECT 690
3 hrs	Alternate Energy Systems	ECT 695
3 hrs	Independent Study in Electronics & Computer Technology	ECT 699
3 hrs	Special Topics in Electronics & Computer Technology	ECT 759

Computer Information Technology Specialization

3 hrs	Computer Networking I	ITT 629
3 hrs	Computer Networking II	ITT 630
3 hrs	Wide Area Networks	ITT 725
3 hrs	Network Services for the Enterprise	ITT 745
3 hrs	E-commerce Design and Implementation	BUED 624

Telecommunications Technology Specialization

3 hrs	Wireless Application Protocols I	ITT 601
3 hrs	Digital Communications I	ITT 610
3 hrs	Digital Communications II	ITT 611
3 hrs	Wireless Communication Systems I	ITT 650
3 hrs	Optical Communication Systems I	ITT 655
3 hrs	Satellite and Personal Communication Systems	ITT 660
3 hrs	Wireless Geo-location Systems I	ITT 665
3 hrs	Communication Circuit Development Laboratory I	ITT 670
3 hrs	Video Communication Systems	ITT 675
3 hrs	Radio Wave and Optical Signal Propagation	ITT 680
3 hrs	Optical Communication Systems II	ITT 755
3 hrs	Wireless Communication Systems II	ITT 760
3 hrs	Wireless Geo-location Systems II	ITT 765
3 hrs	Communication Circuit Development Laboratory II	ITT 770

Microelectronics and Materials Technology Specialization

3 hrs	Microelectronic Fabrication Technology	ECT 614
3 hrs	Introduction to Semiconductor Manufacturing Equipment Technology	ECT 615
3 hrs	Applied Materials, Semiconductor, Superconductivity	ECT 616
3 hrs	Advanced Solid State Devices	ECT 617
3 hrs	Advanced VLSI, Film, and IC Process Technology	ECT 714

Control and Systems Technology Specialization

4 hrs	Electromechanical Systems Analysis	ECT 600
3 hrs	Electronic Instrumentation for Remote Sensing Applications	ITT 634
3 hrs	Analysis and Design of Mechatronic Systems	ECT 635
3 hrs	Electronic Automated Testing Systems	ECT 640

Required Comprehensive Examination Course

0 hrs	Masters Comprehensive Examination	MSIT 777
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MASTER OF SCIENCE IN INDUSTRIAL TECHNOLOGY
Concentration in Electronics and Computer Technology
(Project Option)

A total of 39 hours is required for a Master of Science in Industrial Technology (project option). The total consists of 12 credits of **Core Courses**; also 6 credits of **Management Electives**, 12 credits of **Technical Electives**, 0 credits of a **Required Comprehensive Examination Course** and 9 credits of **Required Courses**.

Core Courses
(12 credit)

3 hrs	Problem Solving in Industrial Technology	MSIT 610
3 hrs	Concepts of Technological Innovations	MSIT 700
3 hrs	Leadership Development Seminar	MSIT 740
3 hrs	Statistical and Research Methods in Industrial Technology I	MSIT 779

Management Electives-Electronics and Computer Technology
(6 credit)

3 hrs	Telecommunications Management	ITT 620
3 hrs	Systems Integration for Telecommunications Managers	ECT 730
3 hrs	Telecommunications Management Issues	ECT 735
3 hrs	Regulatory and Policy Issues for Communication Systems	ITT 740
3 hrs	Electric Energy and Environmental Management	ECT 785

Technical Electives-Electronics and Computer Technology

(Student is to select 12 credit of Technical Electives course from any SOT department or with prior approval, any NCA&TSU department)

General Technology Specialization

3 hrs	Energy, Power and The Environment	ECT 685
3 hrs	Special Problems in Electronics and Computer Technology	ECT 690
3 hrs	Alternate Energy Systems	ECT 695
3 hrs	Independent Study in Electronics & Computer Technology	ECT 699
3 hrs	Special Topics in Electronics & Computer Technology	ECT 759

Computer Information Technology Specialization

3 hrs	Computer Networking I	ITT 629
3 hrs	Computer Networking II	ITT 630
3 hrs	Wide Area Networks	ITT 725
3 hrs	Network Services for the Enterprise	ITT 745
3 hrs	E-commerce Design and Implementation	BUED 624

Telecommunications Technology Specialization

3 hrs	Wireless Application Protocols I	ITT 601
3 hrs	Digital Communications I	ITT 610
3 hrs	Digital Communications II	ITT 611
3 hrs	Wireless Communication Systems I	ITT 650
3 hrs	Optical Communication Systems I	ITT 655
3 hrs	Satellite and Personal Communication Systems	ITT 660
3 hrs	Wireless Geo-location Systems I	ITT 665
3 hrs	Communication Circuit Development Laboratory I	ITT 670
3 hrs	Video Communication Systems	ITT 675
3 hrs	Radio Wave and Optical Signal Propagation	ITT 680
3 hrs	Optical Communication Systems II	ITT 755
3 hrs	Wireless Communication Systems II	ITT 760
3 hrs	Wireless Geo-location Systems II	ITT 765
3 hrs	Communication Circuit Development Laboratory II	ITT 770

Microelectronics and Materials Technology Specialization

3 hrs	Microelectronic Fabrication Technology	ECT 614
3 hrs	Introduction to Semiconductor Manufacturing Equipment Technology	ECT 615
3 hrs	Applied Materials, Semiconductor, Superconductivity	ECT 616
3 hrs	Advanced Solid State Devices	ECT 617

MASTER OF SCIENCE IN INDUSTRIAL TECHNOLOGY
Concentration in Electronics and Computer Technology
(Thesis Option)

A total of 36 hours is required for a Master of Science in Industrial Technology (thesis option). The total consists of 12 credits of **Core Courses**; also 6 credits of **Management Electives**, 9 credits of **Technical Electives**, 0 credits of a **Required Comprehensive Examination Course** and 9 credits of **Required Courses**.

Core Courses
(12 credit)

3 hrs	Problem Solving in Industrial Technology	MSIT 610
3 hrs	Concepts of Technological Innovations	MSIT 700
3 hrs	Leadership Development Seminar	MSIT 740
3 hrs	Statistical and Research Methods in Industrial Technology I	MSIT 779

Management Electives-Electronics and Computer Technology
(6 credit)

3 hrs	Telecommunications Management	ITT 620
3 hrs	Systems Integration for Telecommunications Managers	ECT 730
3 hrs	Telecommunications Management Issues	ECT 735
3 hrs	Regulatory and Policy Issues for Communication Systems	ITT 740
3 hrs	Electric Energy and Environmental Management	ECT 785

Technical Electives-Electronics and Computer Technology

(Student is to select 9 credit of Technical Electives course from any SOT department or with prior approval, any NCA&TSU department)

General Technology Specialization

3 hrs	Energy, Power and The Environment	ECT 685
3 hrs	Special Problems in Electronics and Computer Technology	ECT 690
3 hrs	Alternate Energy Systems	ECT 695
3 hrs	Independent Study in Electronics & Computer Technology	ECT 699
3 hrs	Special Topics in Electronics & Computer Technology	ECT 759

Computer Information Technology Specialization

3 hrs	Computer Networking I	ITT 629
3 hrs	Computer Networking II	ITT 630
3 hrs	Wide Area Networks	ITT 725
3 hrs	Network Services for the Enterprise	ITT 745
3hrs	E-commerce Design and Implementation	BUED 624

Telecommunications Technology Specialization

3 hrs	Wireless Application Protocols I	ITT 601
3 hrs	Digital Communications I	ITT 610
3 hrs	Digital Communications II	ITT 611
3 hrs	Wireless Communication Systems I	ITT 650
3 hrs	Optical Communication Systems I	ITT 655
3 hrs	Satellite and Personal Communication Systems	ITT 660
3 hrs	Wireless Geo-location Systems I	ITT 665
3 hrs	Communication Circuit Development Laboratory I	ITT 670
3 hrs	Video Communication Systems	ITT 675
3 hrs	Radio Wave and Optical Signal Propagation	ITT 680
3 hrs	Optical Communication Systems II	ITT 755
3 hrs	Wireless Communication Systems II	ITT 760
3 hrs	Wireless Geo-location Systems II	ITT 765
3 hrs	Communication Circuit Development Laboratory II	ITT 770

Microelectronics and Materials Technology Specialization

3 hrs	Microelectronic Fabrication Technology	ECT 614
3 hrs	Introduction to Semiconductor Manufacturing Equipment Technology	ECT 615
3 hrs	Applied Materials, Semiconductor, Superconductivity	ECT 616
3 hrs	Advanced Solid State Devices	ECT 617

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
School of Graduate Studies
PLAN OF GRADUATE WORK

Date _____

Last Name	First Name	M.I.	Student ID

School/College	Program	Degree Sought	Date Expected

Master's Option

Check One	X	Total Hours Required	Course Hours	Project Hours	Thesis Hours
Course Work Only					
Project					
Thesis					

Doctoral

Total Hours Required	Course Hours	Dissertation Hours

Modern Language (if required)

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Subject of Thesis/Dissertation (if required)

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Advisory Committee (if known)

**GRADUATE COURSES COMPLETED AT OTHER INSTITUTIONS FOR WHICH
TRANSFER CREDIT IS REQUESTED TOWARD DEGREE**

Institution	Number and Name of Course	Date	Credits	Grade

To officially transfer credits from another university a Transfer of Credit form must be completed and approved by the program and the School of Graduate Studies.

MSIT Core Course Descriptions

MSIT 610 Problem Solving in Manufacturing Technology 3(3-0)

This course teaches fundamental of problem solving as they are applied to a technology environment. Included are analytical as well as creative problem solving techniques. It also explores contemporary issues of innovation in the work place.

MSIT 700 Concepts in World Class Manufacturing 3(3-0)

This course will provide instruction in the concept of World Class Manufacturing. This includes topics such as Just-in-Time (JIT), Total Quality Control (TQC), human resource management; quick changeover, small batch sizes, automation, and time based competitive advantage.

MSIT 740 Leadership Development Seminar 3(3-0)

This is an experiential seminar designed for assessment of the individuals managerial strengths and weaknesses in a manufacturing management position. Current and evolving leadership issues will be discussed and leadership models will be presented. Managerial and leadership issues in high participation work places will be stressed. Students will participate in behavioral simulations and receive psychometric feedback.

MSIT 779 Statistical and Research Methods in Industrial Technology I 3(3-0)

This course introduces the concepts and methods of statistics, which include descriptive statistics, probability theory, sampling distribution, interval estimation, hypothesis testing, statistical inferences, linear and multiple regressions, auto and cross correlation, and nonparametric statistical methods. The course also emphasizes the applications of the statistics to the research and development in industrial technologies, which include research design, data collection and analysis, proposal development and reports. Prerequisites: Graduate Standing

MSIT 780 Statistical and Research Methods in Industrial Technology II 3(3-0)

This course is a continuation of MSIT 779. This course will cover advanced methods and evaluation of research in Industrial Technology. Emphasis will be placed on theory, planning, research design, data collection, analysis and interpretation of research findings. Critical review and analysis of research literature and preparation of formal research proposals will also be covered. Prerequisites: MSIT 779

ECT Course Descriptions for MSIT Program

LEVEL 600 COURSES

ECT 600 Electromechanical Systems Analysis 4(4-0)

This course deals with the fundamentals of electrical and mechanical dynamical systems. Frequency and time domain analysis techniques are utilized. Electrical and mechanical applications of first and second order linear differential and difference equations are examined through transform techniques. Specialized applications software packages are examined. Prerequisites: DEPARTMENTAL APPROVAL

ITT 601 Wireless Application Protocols 3(2-2)

This course takes you through the basics of Wireless Application Protocols (WAPs), and provides all the information needed to create WAP pages using the Wireless Markup Language (WML). The course will include an introduction to WAP and WML, cards and decks, text formatting elements, navigational commands in WML, and WML variables. Prerequisites: ECT 201 and Junior Standing

ITT 610 Digital Communications I 3(2-2)

The class will investigate digital communications systems for various signals including audio, video and data. Topics include: sampling, quantization, multiplexing, coding, modems, various compression schemes, signal impairments, and various digital modulation schemes. Prerequisites: ECT 350

ITT 611 Digital Communications II 3(2-2)

This course is a continuation of ECT 610. Emphasis is placed on multimedia networks and their supporting platforms. Topics include audio and video standards and compression schemes, cable modems and xDSL schemes. Prerequisites: ECT 610 or departmental approval

ECT 614 Microelectronic Fabrication Technology 3(1-4)

This course provides basic lab works on processes as wafer preparation, oxidation, photolithography, doping and deposition used in semiconductor device fabrication. Wafer test equipments, measurement/evaluation techniques, as well as clean room microcontamination control and operation/safety practices are taught through industry field trips and hands-on experiments. Economics and industrial production control issues are examined. Students project on simple mask-making, and fabricating a working transistor - based IC. Prerequisites: ECT 314 or ECT 414.

ECT 615 Introduction to Semiconductor Manufacturing Equipment Technology 3(1-4)

This course teaches basic industrial instrumentation (electrical and non-electrical) and automation, as well as associated fundamental concepts used to develop various applications for the semiconductor industry. This course covers various industrial applications including: Vacuum theory and technology, Design and Installation of industrial clean room facilities and equipments for photolithography, CVD/PVD, RF plasma, etc.. Prerequisites: ECT 360, ECT 414

ECT 616 Applied Materials, Semiconductors, and Superconductivity 3(2-2)

This course covers band theory of solids, crystal imperfections; mechanical and thermal properties; microscopic theory of conductivity, polarizability, permeability, including high frequency effect; Elemental and compound semiconductors; Introduction to BCS theory of superconductivity, Josephson tunneling, type II superconductors. Laboratory experiments conducted in the course includes: basic measurements of mechanical, chemical, thermal, electrical and magnetic properties of various electronic materials; fabrication and testing of solar cells, Josephson junction, cryogenics, and vacuum deposition of films. Prerequisites: PHYS 225, 226, 235, 236

ECT 617 Advanced Solid State Devices 3(2-2)

This course covers band model and carrier transport in semiconductors; excess carriers; Interfaces; Physics of the p-n junction and MOS sandwich; IC design at low frequencies for TTL, CMOS, and analog circuitry. The course also includes a broad review of the theory/design/fabrication of monolithic, film, heterojunction, and high frequency semiconductor devices involving quantum dots/wires, mesoscopic devices, Rf Gunn effect, laser sources etc. for integrated optics, nanotechnology, and quantum computing. Students shall use advanced simulation tools for extensive numerical modeling of semiconductor devices and fabrication processes. Prerequisites: ECT 414

ITT 620 Telecommunications Management 3(2-2)

This course addresses fundamental principles of telecommunications management, which includes network management and administration, the telecommunications marketplace, and the planning and evaluation of systems. The technology of modern telecommunications systems is also reviewed. Prerequisites: ECT 350.

ITT 630. Computer Networking II 3(2-2)

The course covers the advanced study of Local Area Networks (LAN) and Wide Area Networks (WAN). The students will develop competences in designing and implementing enterprise-wide networks using routers and switches. Prerequisites: ECT 530.

ITT 634 Electronic Instrumentation for Remote Sensing Applications 3(2-2)

This course will provide practical knowledge of the operation of electronics instruments used in the applications of telemetry, remote sensing and detection. Possible electronic systems that will be discussed include RADAR, SONAR, LIDAR, and SODAR. Prerequisites: ECT 350 or departmental approval

ECT 635 Analysis and Design of Mechatronic Systems 3(1-4)

This course deals with the principles of analyzing and designing mechatronics systems. This course includes a review of logic gates, microprocessor architecture, sensors and actuators, A/D and D/A conversion techniques, real-time multi-tasking programming concepts, and direct digital control implementation. The course includes "hands-on" experiences through several laboratory assignments and a final team project. Prerequisites: ECT 201, ECT 312, ECT 313.

ECT-640 Electronic Automated Testing Systems 3(2-2)

This course addresses the fundamentals of electronic automated testing systems. Topics include: Production, reliability, and maintenance testing. Various types of Automated Test Equipment (ATE) are addressed, including Built in Test Equipment (BITE) and stand alone systems. Prerequisites: ECT 360.

ITT 650 Wireless Communication Systems I 3(2-2)

This course covers fundamental theory and design of high capacity wireless communication systems. Topics include trunking, propagation effects, frequency reuse, modulation methods, coding and equalization. Emerging cellular and next generation personal communication systems will also be analyzed. Prerequisites: ECT 350

ITT 655 Optical Communication Systems I 3(2-2)

This course covers free space and fiber optic technologies (including lasers, optical amplifiers and optical filters) with applications to high-speed long distance systems, local area networks and communication systems. Prerequisites: ECT 350

ITT 660 Satellite and Personal Communication Systems 3(2-2)

This course covers the theory and practice of satellite communications including: orbits, launchers, spacecraft link budgets, modulation techniques, coding, multiple access techniques, propagation effects and earth terminals. Prerequisites: ECT 350

ITT 665 Wireless Geo-location Systems I 3(2-2)

This course will describe the basic concepts and mechanics of Global Positioning Systems (GPS) and Inertial Navigation Systems (INS). Practical applications of GPS, INS and GPS/INS will be covered. Simple algebraic mathematical calculations will be completed. Prerequisites: ECT 350 or departmental approval

ITT 670 Communication Circuit Development Laboratory I 3(1-4)

This course studies advanced methods of analysis of communication circuits including oscillators, radio frequency amplifiers, matching networks, modulators, mixers, and detectors for HF through UHF frequency range using Y- and S- parameter methods. Prerequisite: ECT 350.

ITT 675 Video Communication Systems 3(2-2)

This course will study the techniques used to transmit and receive analog and digital video information. This course will also discuss current state of the art video technology such as High Definition Television (HDTV). Prerequisite: ECT 350.

ITT 680 Radio Wave and Optical Signal Propagation 3(2-2)

This courses models the behavior of unguided electromagnetic and optical waves in the atmosphere, space, urban and indoor environments. The course will also discuss path, frequency and antenna selection for practical radio wave communication systems. Prerequisite: ECT 350.

ECT 685 Energy Power and the Environment 3(3-0)

This course will cover the basic concepts of electric power generation, utilization, and power networks. How total energy consumption and the global economy, affects the environment will be studied. Prerequisite: ECT 355

ECT 695 Alternate Energy Systems 3(3-0)

This course will cover the production of electric energy from alternate energy sources including solar, wind, hydro, biomass, geothermal and ocean. Also, this course will provide the background knowledge of the characteristics of direct conversion, electromechanical conversion, and storage devices used in alternate energy systems. This course will also cover power system issues associated with integration of small scale energy sources into the electricity grid will be fully investigated. Prerequisite: ECT 355 or Departmental Approval

ECT 690 Special Problems in Electronics and Computer Technology 3(3-0)

This lecture course is used to introduce new topics in the field of electronics and computer technology. The subject matter will be identified prior to the beginning of the course. Prerequisite: Departmental Approval.

ECT 699 Independent Study in Electronics & Computer Technology Credit 3 (3-0)

The student selects a problem (technical or managerial) in consultation with a faculty member in an area related to Electronics Technology or Computer Technology or Telecommunications or Networking. The student along with the faculty member defines the problem's objectives and a solution is pursued. Prerequisite: Graduate Standing.

LEVEL 700 COURSES

ECT 714 Advanced VLSI, Film, and IC process Technology

This course introduces computer aided design tools for VLSI; Mask design styles, layout editors, placement/routing, design rule checking, etc.; thick films, advanced PVD/CVD systems; advanced lithographic and IC process techniques. The course also presents application to low frequency, Rf, and optical frequency micro- and nano-electronic devices. Prerequisite: ECT 614 or 615

ITT 725 Wide Area Networks 3(3-0)

This course will examine Wide Area Networks (WANs) and associated media devices and protocols. Also in this course the design, simulation, and implementation of extranet and internet WAN systems will be developed and tested. Prerequisite: Departmental Approval

ITT 730 Systems Integration for Telecommunications Managers 3(2-2)

This course delineates methods by which telecommunications systems can be put together to serve the needs of an organization. Students trace how the project manager should operate under constraints of time, cost, performance, competition, and regulation. The course involves extended case studies and group project. Prerequisites: ECT 620

ITT 735 Telecommunication Management Issues 3(2-2)

This course assesses the impact of current and future trends on telecommunication landscape. Topics include technological changes, strategic planning, financial analysis, and the roles of organizational entities such as research and development, production, human resources, and operations. Prerequisite: ECT 620

ITT 740 Regulatory and Policy Issues for Communication Systems 3(3-0)

This course examines current codes and procedures in sampling, engineering standards, testing procedures and guidelines. Data analysis using computer modeling and statistical analysis will be presented. Prerequisite: Departmental Approval

ITT 745 Network Services for the Enterprise 3(3-0)

The principles of current wired and wireless services in the telecommunication industry are analyzed for systems and effectiveness. Projected trends and patterns of systems applicable to the industrial communication network will be researched. Prerequisite: Departmental Approval

ITT 750 Telecommunications Co-op 3(3-0)

The co-op experience is designed to provide students with an intern experience of working full-time in a technical environment related to electronics and computer technology or telecommunications. For 3 hours of credit, the student must be employed full-time for one semester. Evaluation of student will be based on reports from student's work supervisor and co-op coordinator. Prerequisite: 15 hours of graduate credit.

ITT 755 Optical Communication Systems II 3(2-2)

This course is a continuation of ECT 655. The course will focus primarily on optical signal processing technologies as they are applied to high-speed communication systems. Prerequisites: ECT 655

ECT 759 Special Topics in Electronics & Computer Technology 3(3-0)

This course involves the study of a topic not addressed by an existing course in the department. Typically, a topic is selected from within a new or evolving area in the field. Prerequisite: Departmental approval.

ITT 760 Wireless Communication Systems II 3(2-2)

The course will discuss the transmission of data over mobile links and digital packet data systems. The course will also address security and privacy issues in wireless communication systems. These topics will be introduced via in-

depth case studies of wireless standards such as IS-41, GSM, PCS and third generation standards and technologies.
Prerequisites: ECT 650 or ECT 660

ITT 765 Wireless Geo-location Systems II 3(2-2)

This course will provide integrated practical examples, in-depth case studies and guidelines for building GPS systems. The course will review in-depth implementation techniques for position location systems. Prerequisites: ECT 665 or Departmental Approval

ITT 770 Communication Circuit Development Laboratory II 3(1-4)

This course is a continuation of ECT 670. The course will study practical methods of building a complete high frequency or ultra high frequency communication system at the discrete component level. Prerequisites: ECT 670

ECT 785 Electric Energy and Environmental Management 3(3-0)

This course will discuss the role of electricity from fossil and nuclear fuels, and renewable resources. It will investigate the impact of high voltage transmission lines as well as the health effects of electricity generation. The course will do an assessment of cogeneration cycles and demand side management. In addition, emission control in the US electric utility industry and an evaluation of uncertainties in quantifying emissions impacts will be studied.
Prerequisites: ECT 685 or Departmental Approval

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