CURRICULUM GUIDE

FOR THE

BACHELOR OF SCIENCE DEGREE

IN

ELECTRONICS TECHNOLOGY

CONCENTRATIONS IN:

COMPUTATIONAL TECHNOLOGY

INFORMATION TECHNOLOGY

Department of Electronics, Computer, and Information Technology
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CONTENTS

Program Details

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 obtain copies of both handbooks as well as the University Bulletin. The student should also remain 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.

The Electronics, Computer, and Information Technology Department is focused 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 Electronic Technologist.

Currently there are three undergraduate concentrations:

- Computational Technology (Major Code: 0289)
- General (Major Code: 0184)
- Information Technology (Major Code: 0290)

Certificate

- Certificate Program in Radio Frequency & Microwave Wireless Communication Systems

The Bachelor of Science in Electronics Technology (General) program is designed to prepare individuals to become technologists who design, build, install, test, troubleshoot, repair, and modify developmental and production electronic components, equipment, and systems such as industrial/computer controls, manufacturing systems, communication systems, and power electronic systems.
A broad-based core of courses, including basic electricity, solid-state fundamentals, digital concepts, and microprocessors, ensures that the student will develop the skills necessary to perform entry-level tasks. Emphasis is placed on developing the student's ability to analyze and troubleshoot electronic systems. Graduates should qualify for employment as engineering assistants or electronic technologists with job titles such as electronics engineering technologist, field service technologist, maintenance technologist, electronic tester, electronic systems integrator, bench technologist, and production control technologist.

The Bachelor of Science in Electronics Technology with a concentration in Computational Technology is a program that embraces all of the possible inferences drawn from its name: its scope will include the science and technology of performing, analyzing, and archiving large-scale computations over wide-area networks, and its goal will be to employ large-scale computer and network resources in pursuit of scientific and technological educational and research goals.

The Bachelor of Science in Electronics 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?

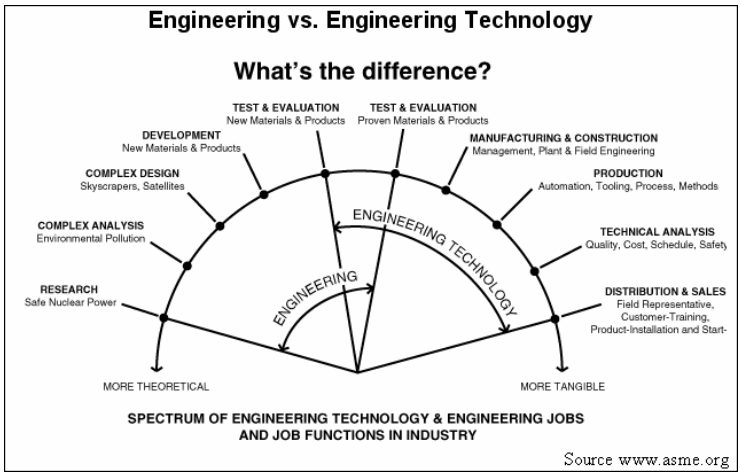
The rapid growth of technology in our society has been sustained by the efforts of a technological team of professionals. The technologist is a key member of the team, which includes scientists and the engineers, that is responsible for applying the research, analysis and design of projects. Technologists 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 will then transform the concept into a prototype or product. The prototype or product is then given to the technician who will test 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 technological field, 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.



Information Technology, Computer Science or Information Systems? [1]

A very common question we are asked is "What's the difference between computer science and information technology?" While information technology has strong roots in computer science, there are some important differences, which can help to define IT. These differences fall into professional and curricular categories.

At the professional level, the computer scientist tends to view computing from the standpoint of its design. In contrast to the vision of information technology articulated above, the computer scientist tends to build and extend the underlying technology, while the information technologist tends to apply available technology to solve real-world problems for people. The computer scientist tends to be motivated by the inner workings of the computer, e.g. how it works under the hood, while the information technologist is motivated by using the computer as a tool to solve practical problems that impact the way people live and work. Another way of describing the difference is that the information technologist identifies a need for technology, which the computer scientist then creates, and which the information technologist finally helps people to use effectively.

At the curricular level, information technology differs from computer science in many respects. First, there is a

stronger emphasis on programming in computer science than in information technology. Information technologists certainly build software applications, and programming is certainly a critical skill in IT, but the style of programming in IT differs from that in Computer Science. The typical IT project involves gluing together available components in high-level environments and providing an accessible interface to the functionality those components provide. The typical computer science application involves writing large programs from scratch, using traditional programming languages, and focusing on software architecture, data structures and algorithm development issues. Computer Science also requires significantly more math and science than information technology, mainly because extending the underlying technology requires a more thorough mathematical foundation than applying that technology. Finally, the computer science curriculum is "deeper" in that there are more required prerequisites for the intermediate and advanced courses in CS. Information Technology has a flatter prerequisite structure, which facilitates the transfer of students into IT from other majors.

For this reason, we used to say that if you can't decide between computer science and information technology, start in computer science because CS credits will transfer to IT more easily than vice versa and "catching up" in IT is more feasible.

The main difference between information technology and information systems (IS), also called management information systems (MIS) or computer information systems (CIS), is that MIS is a business program that focuses on the applications and implications of computing in the business domain. MIS students take the Business core and approach computing from the perspective of a manager in the business domain. IT does not focus on any single domain but instead focuses on the selection, integration and deployment of computing technology throughout society.

Job Outlook

Information Technology Related Careers [2]

- Earnings

Median annual earnings of computer support specialists were $39,100 in 2002. The middle 50 percent earned up to $51,680. The lowest 10 percent earned less than $23,060, and the highest 10 percent earned up to $67,550. Median annual earnings in the industries employing the largest numbers of computer support specialists in 2002 were:

- Professional and commercial equipment and supplies merchant wholesalers $46,740
- Software publishers $42,870
- Computer systems design and related services $41,110
- Management of companies and enterprises $40,850
- Elementary and secondary schools $33,480

Median annual earnings of network and computer systems administrators were $54,810 in 2002. The middle 50 percent earned up to $69,530. The lowest 10 percent earned less than $34,460, and the highest 10 percent earned more than $86,440. Median annual earnings in the industries employing the largest numbers of network and computer systems administrators in 2002 were:

- Wired telecommunications carriers $59,710
- Computer systems design and related services $58,790
- Management of companies and enterprises $58,610
- Data processing, hosting, and related services $56,140
- Elementary and secondary schools $48,350

According to Robert Half International, starting salaries in 2003 ranged up to $56,500 for help-desk support staff, and up to $67,250 for more senior technical support specialists. For systems administrators, starting salaries in 2003 ranged up to $70,250.

Electronic Technology Related Careers [3]

- Job Outlook

Opportunities will be best for individuals with an associate degree or extensive job training in engineering technology. As technology becomes more sophisticated, employers will continue to look for technicians who are skilled in new technology and require a minimum of additional job training. An increase in the number of jobs related to public health and safety should create job opportunities for engineering technicians with the appropriate certification.

Overall employment of engineering technicians is expected to increase about as fast as the average for all

occupations through 2012. Competitive pressures will force companies to improve and update manufacturing facilities and product designs, resulting in more jobs for engineering technicians. However, the growing use of advanced technologies, such as computer simulation and computer-aided design and drafting will continue to increase productivity and limit job growth. In addition to growth, many job openings will stem from the need to replace technicians who retire or leave the labor force.

As is the case for engineers, employment of engineering technicians is influenced by local and national economic conditions. As a result, the employment outlook varies with industry and specialization. Growth in the largest specialty—electrical and electronics engineering technicians—is expected to be about as fast as the average, and there will also be many jobs created by the need to replace technicians who retire or leave the labor force. Employment of environmental engineering technicians is expected to grow faster than average, partly due to increased demand for environmental protection and partly due to recognition of environmental engineering technicians as a separate occupation.

Network Administrators design, install, and support the network operating system of an enterprise. They support software users, maintain network hardware and software, analyze problems, and monitor the network's performance. In design work, they research an organization's needs to identify network requirements. They may also plan or implement the network's security measures. The U.S. Department of Labor projects that network administrators will be one of the fastest growing occupations through 2010.

Electronics Technologist help design, develop, test, and manufacture electronic equipment, such as communication equipment, radar, industrial and medical measuring or control devices, navigational equipment, and computers. They often install, program, and repair programmable logic controls (PLC's), which monitor and control machinery and devices. They check common causes of problems, consult schematics and specifications, and use software programs and testing equipment to diagnose malfunctions.

- Earnings

Median annual earnings of engineering technicians by specialty is shown in the following tabulation.

- Electrical and electronic engineering technicians $42,950
- Electro-mechanical technicians $38,120

Median annual earnings of electrical and electronics engineering technicians were $42,950 in 2002. The middle 50 percent earned between $33,760 and $53,200. The lowest 10 percent earned less than $26,770, and the highest 10 percent earned more than $64,070. Median annual earnings in the industries employing the largest

numbers of electrical and electronics engineering technicians in 2002 are shown below:

Federal government	$58,520
Wired telecommunications carriers	$49,610
Architectural, engineering, and related services	$43,670
Semiconductor and other electronic component manufacturing	$40,110
Navigational, measuring, electro-medical, and control instruments manufacturing	$39,760

Curricula

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
Department of Electronics, Computer, and Information Technology
Bachelor of Science in Electronics Technology
Computational Technology Concentration (Major Code: 0289)

Freshman Year

First Semester	Credit	Second Semester	Credit
UNST 100 or ECT 103 Univ. Exp. or Colloquium I	1	UNST 130 Analytical Reasoning	3
UNST 110 Critical Writing	3	UNST 140 African American Exp.	3
UNST 120 The Contemporary World	3	ECT 104 Colloquium II	0
ECT 101 Microcomputer Applications	3	ECT 201 Intro. to Computer Program	3
ECT 120 Quan. Fund. of Elect.	3	ECT 211 Electric Circuits I	3
MATH 131[1] Calculus I	4	MATH 132 Calculus II	4
	17		16

Sophomore Year

First Semester	Credit	Second Semester	Credit
GCS 292 Technical Communication	3	CHEM 106[3] General Chem. I	3
UNST Cluster Theme Elective[2]	3	CHEM 116[3] General Chem. I Lab.	1
ECT 198 Freshman Project[6]	1	UNST Cluster Theme Elective[2]	3
ECT 212 Electric Circuits II	3	ECT 312 Elect. Devices & Circuits I	3
ECT 213 Digital Circuits	3	ECT 313 Elec. Microcomp. Sys. I	3
MATH 224 or MATH 231 Statistics or Calculus III	3	ECT 350 or ECT 355 or ECT 360	3
	16		16

Junior Year

First Semester	Credit	Second Semester	Credit
UNST Cluster Theme Elective[2]	3	UNST Cluster Theme Elective[2]	3
ECT 298 Sophomore Project	2	SPCH 250 Speech Fundamentals	3
ECT 314 Elect. Devices & Circuits II	3	PHYS 242 General Physics II	3
PHYS 241 General Physics I	3	PHYS 252 General Physics II Lab.	1
PHYS 251 General Physics I Lab.	1	Computational Tech Elective[4]	3
Computational Tech Elective[4]	3	Computational Tech Elective[4]	3
Computational Tech Elective[4]	3		16
	18		

Senior Year

First Semester	Credit	Second Semester	Credit
BME Elective[5]	3	BME Elective[5]	3
ECT 398 Junior Project	2	BME Elective[5]	3
BME Elective[5]	3	Computational Tech Elective[4]	3
BME Elective[5]	3	ECT 598 Senior Project: A Capstone Experience	3
Computational Tech Elective[4]	3		12
Computational Tech Elective[4]	3		
	17		

Total Credit Hours = 128

Note(s):
(1) A prerequisite of MATH 110 is recommended for students lacking high school Advanced Algebra and Trigonometry.
(2) Student must choose one cluster and take 12 credit hours in that cluster.
(3) A prerequisite of CHEM 099 is recommended for students lacking high school Chemistry.
(4) See an advisor for a list of approved Computational Technology Electives.
(5) See an advisor for a list of approved Business, Management, and Economics Electives.
(6) It is highly recommended that students complete ECT 121 before enrolling into ECT 198.

Bachelor of Science in Electronics Technology
With a concentration in Computational Technology
Select 21 credit hours from courses listed below

Electronics and Computer Technology

ECT 330 Robotics and Controls I
ECT 430 Robotics and Controls II
ECT 600 Electromechanical Systems Analysis
ECT 635 Analysis and Design of Mechatronic Systems
ECT 681 Power System Analysis and Control

Information and Telecommuniction Technology

ITT 303 Introduction to High Performance Computing
ITT 304 High Performance Computing Architecture and System Administration
ITT 401 Introduction to Parallel Programming
ITT 431 Advanced Programming Techniques with an OOP Language
ITT 634 Electronic Instrumentation for Remote Sensing Applications
ITT 650 Wireless Communication Systems
ITT 665 Wireless Geo-location Systems
ITT 670 Communication Circuit Development Laboratory
ITT 680 Radio Wave and Optical Signal Propagation
ITT 684 Introduction to Optical Information Processing
ITT 688 Microwave and Radar System Analysis
ITT 689 Antenna Systems Technology

Mathematics

MATH 240 Introduction to Computational Tools
MATH 431 Introduction to Differential Equations
MATH 432 Introduction to Applied Mathematics
MATH 440 Numerical Methods
MATH 450 Linear Algebra and Matrix Theory
MATH 465 Introduction to Scientific Computing
MATH 480 Introduction to Mathematical Modeling
MATH 608 Methods of Applied Statistics
MATH 623 Probability Theory and Applications

Physics

PHYS 405 Mathematical Physics
PHYS 445 Introduction to Computations in Physics
PHYS 530 Computational Techniques in Physics

Co-Operative Training

ECT 197 Co-Operative Training in Industry I
ECT 297 Co-Operative Training in Industry II
ECT 397 Co-Operative Training in Industry III
ECT 497 Co-Operative Training in Industry IV
ECT 498 Co-Operative Training in Industry V

North Carolina A&T State University
SCHOOL OF TECHNOLOGY
Department of Electronics, Computer, and Information Technology
Computational Technology Concentration (Major Code: 0289)
ADVISEMENT SHEET

NAME_____ Classification ( )FR ( )SOPH ( )JR ( )SR ( )TRANSFER

SOCIAL SECURITY NUMBER_____-_____-_____ DATE(s)_____

Course	Credits	Transfer Grade
University Studies (25 hours)		
__UNST 100 or ECT 103 (University Experience)	___1	_____
__UNST 110 (Critical Writing)	___3	_____
__UNST 120 (The Contemporary World)	___3	_____
__UNST 130 (Analytical Reasoning)	___3	_____
__UNST 140 (The African-American Experience)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
Communication Core (6 hours)		
__Speech 250 (Speech Fundamentals)	___3	_____
__GCS 292 (Technical Communication)	___3	_____
or ENG 331 (Writing for Sci. and Tech.)		
or BUED 360 (Business Communication)		
Mathematics Core (11 hours)		
__MATH 131(3) (Calculus I)	___4	_____
__MATH 132 (Calculus II)	___4	_____
__MATH 224 (Intro. to Prob. & Statistics)	___3	_____
or MATH 231 (Calculus III)		
Physical Science Core (12 hours)		
__CHEM 106(1) (General Chemistry I)	___3	_____
__CHEM 116(1) (General Chemistry I Lab)	___1	_____
__PHYS 225 (College Physics I)	___3	_____
__PHYS 235 (College Physics I Lab)	___1	_____
__PHYS 226 (College Physics II)	___3	_____
__PHYS 236 (College Physics II Lab)	___1	_____
Business, Management, and Economics Elective (15 hours)		
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
Computer Technology Core (12 hours)		
__ECT 101 (Microcomputer App.)	___3	_____
__ECT 201 (Intro. to Comp. Program)	___3	_____
__ECT 213 (Digital Circuits)	___3	_____
__ECT 313 (Elec. Microcomp. Sys I)	___3	_____
Electronics Technology Core (15 hours)		
__ECT 120 (Quan. Fund. of Elect.)	___3	_____
__ECT 211 (Electric Circuits I)	___3	_____
__ECT 212 (Electric Circuits II)	___3	_____
__ECT 312 (Electronic Devices & Cir. I)	___3	_____
__ECT 314 (Electronic Devices & Cir. II)	___3	_____
Colloquium Sequence		
__ECT 104 (Colloquium II)	___0	_____
ECIT Project Sequence (8 hours)		
__ECT 198(6) (Freshman Project)	___1	_____
__ECT 298 (Sophomore Project)	___2	_____
__ECT 398 (Junior Project)	___2	_____
__ECT 598 (Senior Project)	___3	_____
ECIT Required Courses (3 hours)		
__ECT 350 (Communication Systems)	___3	_____
or ECT 355 (Power & Machinery)		
or ECT 360 (Industrial Elec. & Controls)		
Computational Technology Concentration (21 hours)		
__Computational Tech Elective	___3	_____
__Computational Tech Elective	___3	_____
__Computational Tech Elective	___3	_____
__Computational Tech Elective	___3	_____
__Computational Tech Elective	___3	_____
__Computational Tech Elective	___3	_____
__Computational Tech Elective	___3	_____

**In order to graduate, each incoming student will be required to earn a minimum grade of "C" for all ECIT Project Sequence courses, Computer Technology Core courses, Electronics Technology Core courses, Mathematics and Physical Science Core courses, and Computational Technology concentration courses.

Note(s): (1) A prerequisite of CHEM 099 is recommended for students lacking high school Chemistry.
(2) See an advisor for a list of approved Computational Technology Electives.
(3) A prerequisite of MATH 110 is recommended for students lacking high school Advanced Algebra and Trigonometry.
(4) See an advisor for a list of approved Business, Management, and Economics Electives.
(5) See an advisor for a list of approved University Studies Theme Cluster Electives.
(6) It is highly recommended that students complete ECT 121 before enrolling into ECT 198.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
Department of Electronics, Computer, and Information Technology
Bachelor of Science in Electronics Technology
General Concentration (Major Code: 0184)

Freshman Year

First Semester	Credit	Second Semester	Credit
UNST 100 or ECT 103 Univ. Exp. or Colloquium I	1	UNST 130 Analytical Reasoning	3
UNST 110 Critical Writing	3	UNST 140 The African-American Exp.	3
UNST 120 Contemporary World	3	ECT 104 Colloquium II	0
ECT 101 Microcomputer Application	3	ECT 201 Intro. to Comp. Program	3
ECT 120 Quan. Fund. of Electronics	3	ECT 211 Electric Circuits II	3
MATH Elective[1, 2]	4	MATH Elective[1, 2]	4
	17		16

Sophomore Year

First Semester	Credit	Second Semester	Credit
GCS 292 Technical Writing	3	CHEM 106[4] General Chemistry I	3
UNST Cluster Theme Elective[3]	3	CHEM 116[4] Gen. Chemistry I Lab.	1
ECT 198 Freshman Project[7]	1	UNST Cluster Theme Elective[3]	3
ECT 212 Electric Circuits II	3	ECT 312 Elect. Devices & Circuits I	3
ECT 213 Digital Circuits	3	ECT 313 Elec. Microcomp. Sys. I	3
MATH Elective[1, 2]	3	MATH 224 Statistics	3
	16		16

Junior Year

First Semester	Credit	Second Semester	Credit
UNST Cluster Theme Elective[3]	3	UNST Cluster Theme Elective[3]	3
ECT 298 Sophomore Project	2	SPCH 250 Speech Fundamentals	3
ECT 314 Elect. Devices & Circuits II	3	PHYS 226 College Physics II	3
PHYS 225 College Physics I	3	PHYS 236 College Physics II Lab.	1
PHYS 235 College Physics I Lab.	1	ECT 360 Indus. Meas. & Control I	3
ECT 350 Communication Systems	3	ECT/ITT Technical Elective[5]	3
ECT 355 Elec. Power & Machinery	3		16
	18		

Senior Year

First Semester	Credit	Second Semester	Credit
BME Elective[6]	3	BME Elective[6]	3
ECT 398 Junior Project	2	BME Elective[6]	3
BME Elective[6]	3	ECT/ITT Technical Elective[5]	3
BME Elective[6]	3	ECT 598 Senior Project: A Capstone Experience	3
ECT/ITT Technical Elective[5]	3		12
ECT/ITT Technical Elective[5]	3		
	17		

Total Credit Hours = 128

Notes:

Note(s):
(1) A prerequisite of MATH 110 is recommended for students lacking high school Advanced Algebra and Trigonometry.
(2) Student must select at least 11 credits from the following list: MATH 110, MATH 131, MATH 132, MATH 231, MATH 431
(3) Student must choose one cluster and take 12 credit hours in that cluster.
(4) A prerequisite of CHEM 099 is recommended for students lacking high school Chemistry.
(5) See an advisor for a list of approved Electronics, Computer, and Information Technology Electives.
(6) See an advisor for a list of approved Business, Management, and Economics Electives.
(7) It is highly recommended that students complete ECT 121 before enrolling into ECT 198.

ECIT Technical Electives (student must select 12 credit hours from any of the following specializations)

General Specialization

ECT 121 Electronic Circuit Fabrication Techniques
ECT 498 Cooperative Training in Industry II
ECT 599 Independent Study
ECT 690 Special Problems in Electronics and Computer Technology
ECT 685 Energy, Power and the Environment
ECT 695 Alternate Energy Systems

Computer Technology Specialization

ITT 236 Applied C Programming I
ITT 237 Applied C++ Programming I
ITT 238 Applied RPG Programming I
ITT 239 Applied Visual Basic Programming I
ITT 240 Applied JAVA Programming I
ITT 301 Hardware and Software Installation and Maintenance
ITT 303 Introduction to High Performance Computing
ITT 304 High Performance Computing Architecture and System Administration
ITT 329 Computer Networking I
ITT 330 Computer Networking II
ITT 337 Applied C++ Programming II
ITT 338 Applied RPG Programming II
ITT 339 Applied Visual Basic Programming II
ITT 340 Introduction to Mainframe Operations
ITT 350 Introduction to DB2 Concepts
ITT 355 Network Servers
ITT 401 Introduction to Parallel Programming
ITT 413 Electronic Microcomputer Systems II
ITT 420 Introduction to Unix/Linux
ITT 423 Computer Systems Architecture
ITT 430 Linux Systems Administration
ITT 431 Advanced Programming Techniques with an OOP Language
ITT 605 Principles of Computer Networking
ITT 615 Networking Security Applications
ITT 625 Computer Database Management
ITT 629 Computer Networking I
ITT 630 Computer Networking II
ITT 635 Administration and Security of Wireless Local Area Networks I
ITT 640 Administration and Security of Wireless Local Area Networks II
ITT 645 Analysis and Troubleshooting of Wireless LAN Systems
ITT 646 Wireless Computer Networking I
COMP 620 Information, Privacy and Security
COMP 627 Wireless Network Security

Telecommunications Technology Specialization

ITT 601 Wireless Application Protocols
ITT 610 Digital Communications I
ITT 611 Digital Communications II
ITT 650 Wireless Communication Systems
ITT 655 Optical Communication Systems
ITT 660 Satellite and Personal Communication Systems
ITT 665 Wireless Geo-location Systems
ITT 670 Communication Circuit Development Laboratory
ITT 675 Video Communication Systems

ITT 680 Radio Wave and Optical Signal Propagation
ITT 684 Introduction to Optical Information Processing
ITT 688 Microwave and Radar System Analysis
ITT 689 Antenna Systems Technology

Microelectronics and Materials Technology Specialization

ECT 414 Introduction to Semiconductor Device Physics and Fabrication
ECT 614 Microelectronic Fabrication Technology
ECT 615 Introduction to Semiconductor Manufacturing Equipment Technology
ECT 616 Applied Materials, Semiconductor, and Superconductivity
ECT 617 Advanced Solid State Devices

Control and Systems Technology Specialization

ECT 330 Robotics and Controls I
ECT 334 Electronic Instrumentation
ECT 430 Robotics and Controls II
ECT 460 Industrial Electronics & Controls II
ECT 600 Electromechanical Systems Analysis
ECT 634 Electronic Instrumentation for Telemetry Applications
ECT 635 Analysis and Design of Mechatronic Systems
ECT 640 Electronic Automated Testing Systems
ECT 645 Power Electronics I
ECT 681 Power System Analysis and Control
ECT 682 Controls and Applications of Electric Machines
ECT 683 Electric Power Quality for the Digital Economy

Co-Operative Training

ECT 197 Co-Operative Training in Industry I
ECT 297 Co-Operative Training in Industry II
ECT 397 Co-Operative Training in Industry III
ECT 497 Co-Operative Training in Industry IV
ECT 498 Co-Operative Training in Industry V

North Carolina A&T State University
SCHOOL OF TECHNOLOGY
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General Concentration (Major Code: 0184)
ADVISEMENT SHEET

NAME_____ Classification ( )FR ( )SOPH ( )JR ( )SR ( )TRANSFER

SOCIAL SECURITY NUMBER_____-_____-_____ DATE(s)_____

Course	Credits	Transfer Grade
University Studies (25 hours)		
__UNST 100 or ECT 103 (University Experience)	___1	_____
__UNST 110 (Critical Writing)	___3	_____
__UNST 120 (The Contemporary World)	___3	_____
__UNST 130 (Analytical Reasoning)	___3	_____
__UNST 140 (The African-American Experience)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
__UNST Cluster Theme Elective(5)	___3	_____
Communication Core (6 hours)		
__Speech 250 (Speech Fundamentals)	___3	_____
__GCS 292 (Technical Communication)	___3	_____
or ENG 331 (Writing for Sci. and Tech.)		
or BUED 360 (Business Communication)		
Mathematics Core (14 hours)		
__Mathematics Elective(3),(6)	___4	_____
__Mathematics Elective(3),(6)	___4	_____
__Mathematics Elective(3),(6)	___3	_____
__MATH 224 (Intro. to Prob. & Statistics)	___3	_____
or SOCI 203 (Social Statistics I)		
or ECON 305 (Elementary Statistics)		
or INEN 270 (Engineering Statistics)		
Physical Science Core (12 hours)		
__CHEM 106(1) (General Chemistry I)	___3	_____
__CHEM 116(1) (General Chemistry I Lab)	___1	_____
__PHYS 225 (College Physics I)	___3	_____
__PHYS 235 (College Physics I Lab)	___1	_____
__PHYS 226 (College Physics II)	___3	_____
__PHYS 236 (College Physics II Lab)	___1	_____

Business, Management, and Economics Elective (15 hours)		
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
Computer Technology Core (12 hours)		
__ECT 101 (Microcomputer App.)	___3	_____
__ECT 201 (Intro. to Comp. Program)	___3	_____
__ECT 213 (Digital Circuits)	___3	_____
__ECT 313 (Elec. Microcomp. Sys I)	___3	_____
Electronics Technology Core (15 hours)		
__ECT 120 (Quan. Fund. of Elect.)	___3	_____
__ECT 211 (Electric Circuits I)	___3	_____
__ECT 212 (Electric Circuits II)	___3	_____
__ECT 312 (Electronic Devices & Cir. I)	___3	_____
__ECT 314 (Electronic Devices & Cir. II)	___3	_____
Colloquium Sequence		
__ECT 104 (Colloquium II)	___0	_____
ECIT Project Sequence (8 hours)		
__ECT 198 (Freshman Project)(7)	___1	_____
__ECT 298 (Sophomore Project)	___2	_____
__ECT 398 (Junior Project)	___2	_____
__ECT 598 (Senior Project)	___3	_____
ECIT Required Courses (9 hours)		
__ECT 350 (Communication Systems)	___3	_____
__ECT 355 (Elec. Power & Machinery)	___3	_____
__ECT 360 (Indus. Meas. & Control I)	___3	_____
Undesignated Concentration (12 hours)		
__ECT/ITT Technical Elective	___3	_____
__ECT/ITT Technical Elective	___3	_____
__ECT/ITT Technical Elective	___3	_____
__ECT/ITT Technical Elective	___3	_____

In order to graduate, each incoming student will be required to earn a minimum grade of "C" for all ECIT Project Sequence courses, Computer Technology Core courses, Electronics Technology Core courses, and Undesignated Concentration courses.

Note(s): (1) A prerequisite of CHEM 099 is recommended for students lacking high school Chemistry.
(2) See an advisor for a list of approved Electronics, Computer, and Information Technology Electives.
(3) A prerequisite of MATH 110 is recommended for students lacking high school Advanced Algebra and Trigonometry.
(4) See an advisor for a list of approved Business, Management, and Economics Electives.
(5) See an advisor for a list of approved University Studies Theme Cluster Electives.
(6) Student must select 11 credit hours from the following list: MATH 110, MATH 131, MATH 132, MATH 231, MATH 431.
(7) It is highly recommended that students complete ECT 121 before enrolling into ECT 198.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
Department of Electronics, Computer, and Information Technology
Bachelor of Science in Electronics Technology
Information Technology Concentration (Major Code: 0290)

Freshman Year

First Semester	Credit	Second Semester	Credit
UNST 100 or ECT 103 Univ. Exp. or Colloquium I	1	UNST 130 Analytical Reasoning	3
UNST 110 Critical Writing	3	UNST 140 African American Exp.	3
UNST 120 The Contemporary World	3	ECT 104 Colloquium II	0
ECT 101 Microcomputer Applications	3	ECT 201 Intro. to Computer Program	3
ECT 120 Quan. Fund. of Elect.	3	ECT 211 Electric Circuits I	3
MATH 131[1] Calculus I	4	MATH 132 Calculus II	4
	17		16

Sophomore Year

First Semester	Credit	Second Semester	Credit
GCS 292 Technical Communication	3	CHEM 106[3] General Chem. I	3
UNST Cluster Theme Elective[2]	3	CHEM 116[3] General Chem. I Lab	1
ECT 198 Freshman Project[6]	1	UNST Cluster Theme Elective[2]	3
ECT 212 Electric Circuits II	3	ECT 312 Elect. Devices & Circuits I	3
ECT 213 Digital Circuits	3	ECT 313 Elec. Microcomp. Sys. I	3
MATH 123 Discrete Math	3	MATH 224 Statistics	3
	16		16

Junior Year

First Semester	Credit	Second Semester	Credit
UNST Cluster Theme Elective[2]	3	UNST Cluster Theme Elective[2]	3
ECT 298 Sophomore Project	2	SPCH 250 Speech Fundamentals	3
ECT 314 Elect. Devices & Circuits II	3	PHYS 226 College Physics II	3
PHYS 225 College Physics I	3	PHYS 236 College Physics II Lab.	1
PHYS 235 College Physics I Lab.	1	CT or TT Elective[4]	3
CT or TT Elective[4]	3	CT or TT Elective[4]	3
CT or TT Elective[4]	3		16
	18		

Senior Year

First Semester	Credit	Second Semester	Credit
BME Elective[5]	3	BME Elective[5]	3
ITT 398 Junior Project	2	BME Elective[5]	3
BME Elective[5]	3	CT or TT Elective[4]	3
BME Elective[5]	3	ITT 598 Senior Project: An Information Technology Capstone Experience	3
CT or TT Elective[4]	3		12
CT or TT Elective[4]	3		
	17		

Total Credit Hours = 128

Note(s):
(1) A prerequisite of MATH 110 is recommended for students lacking high school Advanced Algebra and Trigonometry.
(2) Student must choose one cluster and take 12 credit hours in that cluster.
(3) A prerequisite of CHEM 099 is recommended for students lacking high school Chemistry.
(4) See an advisor for a list of approved Computer Technology or Telecommunication Technology Electives.
(5) See an advisor for a list of approved Business, Management, and Economics Electives.
(6) It is highly recommended that students complete ECT 121 before enrolling into ECT 198.

Bachelor of Science in Electronics Technology
With a concentration in Information Technology
Select 21 credit hours from one of the specializations listed below

Computer Technology Specialization

Animation/Graphics

GCS 418 Web Design for Graphic Communications
GCS 632 Graphic Animation
ITT 601 Wireless Application Protocols
TECH 382 Computer Applications for Technological Studies

Co-Operative Training

ECT 197 Co-Operative Training in Industry I
ECT 297 Co-Operative Training in Industry II
ECT 397 Co-Operative Training in Industry III
ECT 497 Co-Operative Training in Industry IV
ECT 498 Co-Operative Training in Industry V

High Performance Computing

ITT 303 Introduction to High Performance Computing
ITT 304 High Performance Computing Architecture and System Administration
ITT 401 Introduction to Parallel Programming

Mainframe Operations

ITT 340 Introduction to Mainframe Operation
ITT 350 Introduction to DB2 Concepts

Networking

BUED 444 Data Communication and Networks
ITT 301 Hardware and Software Installation and Maintenance
ITT 413 Electronic Microcomputer Systems II
ITT 605 Principles of Computer Networking
ITT 329 or ITT 629 Computer Networking I
ITT 330 or ITT 630 Computer Networking II
ITT 335 Network Servers
ITT 423 Computer System Architecture
ITT 635 Administration and Security of Wireless Local Area Networks I
ITT 640 Administration and Security of Wireless Local Area Networks II
ITT 645 Analysis and Troubleshooting of Wireless LAN Systems
ITT 646 Wireless Computer Networking I

Software Systems

BUAD 341 Introduction to Management Information Systems
BUAD 440 Business Information Systems
BUAD 448 Systems Analysis
BUED 342 Business Programming
BUED 624 E-Commerce
INEN 380 Information Technology for Industrial Engineers
ITT 236 Applied C Programming I
ITT 237 Applied C++ Programming I
ITT 238 Applied RPG Programming I
ITT 239 Applied Visual Basic Programming I
ITT 240 Applied JAVA Programming I
ITT 337 Applied C++ Programming II
ITT 338 Applied RPG Programming II

ITT 339 Applied Visual Basic Programming II
ITT 420 Introduction to Unix/Linux
ITT 430 Linux Systems Administration
ITT 431 Advanced Programming Techniques with an OOP Language

Security

ITT 615 Networking Security Applications
COMP 620 Information, Privacy and Security
COMP 627 Wireless Network Security

Telecommunications Technology Specialization

Digital

ITT 610 Digital Communications I
ITT 611 Digital Communications II

Wireless

ITT 601 Wireless Application Protocols
ITT 635 Administration and Security of Wireless Local Area Network I
ITT 640 Administration and Security of Wireless Local Area Network II
ITT 645 Analysis and Troubleshooting of Wireless LAN Systems
ITT 646 Wireless Computer Networking I
ITT 650 Wireless Communication Systems
ITT 655 Optical Communication Systems
ITT 660 Satellite and Personal Communication Systems
ITT 665 Wireless Geo-location Systems

Systems

ECT 350 Communication Systems
ITT 670 Communication Circuit Development Laboratory I
ITT 675 Video Communication Systems
ITT 680 Radio Wave and Optical Signal Propagation
ITT 684 Introduction to Optical Information Processing
ITT 688 Microwave and Radar Systems Analysis
ITT 689 Antenna Systems Technology

Co-Operative Training

ECT 197 Co-Operative Training in Industry I
ECT 297 Co-Operative Training in Industry II
ECT 397 Co-Operative Training in Industry III
ECT 497 Co-Operative Training in Industry IV
ECT 498 Co-Operative Training in Industry V

North Carolina A&T State University
SCHOOL OF TECHNOLOGY
Department of Electronics, Computer, and Information Technology
Information Technology Concentration (Major Code: 0290)
ADVISEMENT SHEET

NAME_____ Classification ( )FR ( )SOPH ( )JR ( )SR ( )TRANSFER

SOCIAL SECURITY NUMBER_____-_____-_____ DATE(s)_____

Course	Credits	Transfer Grade
University Studies (25 hours)		
__UNST 100 or ECT 103 (University Experience)	___1	_____
__UNST 110 (Critical Writing)	___3	_____
__UNST 120 (The Contemporary World)	___3	_____
__UNST 130 (Analytical Reasoning)	___3	_____
__UNST 140 (The African-American Experience)	___3	_____
__UNST Cluster Theme Electives(5)	___3	_____
__UNST Cluster Theme Electives(5)	___3	_____
__UNST Cluster Theme Electives(5)	___3	_____
__UNST Cluster Theme Electives(5)	___3	_____
Communication Core (6 hours)		
__Speech 250 (Speech Fundamentals)	___3	_____
__GCS 292 (Technical Communication)	___3	_____
or ENG 331 (Writing for Sci. and Tech.)		
or BUED 360 (Business Communication)		
Mathematics Core (14 hours)		
__MATH 131(3) (Calculus I)	___4	_____
__MATH 132 (Calculus II)	___4	_____
__MATH 123 (Discrete Math I)	___3	_____
__MATH 224 (Intro. to Prob. & Statistics)	___3	_____
or SOCI 203 (Social Statistics I)		
or ECON 305 (Elementary Statistics)		
or INEN 270 (Engineering Statistics)		
Physical Science Core (12 hours)		
__CHEM 106(1) (General Chemistry I)	___3	_____
__CHEM 116(1) (General Chemistry I Lab)	___1	_____
__PHYS 225 (College Physics I)	___3	_____
__PHYS 235 (College Physics I Lab)	___1	_____
__PHYS 226 (College Physics II)	___3	_____
__PHYS 236 (College Physics II Lab)	___1	_____

Business, Management, and Economics Elective (15 hours)		
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
__BME Elective(4)	___3	_____
Computer Technology Core (12 hours)		
__ECT 101 (Microcomputer App.)	___3	_____
__ECT 201 (Intro. to Comp. Program)	___3	_____
__ECT 213 (Digital Circuits)	___3	_____
__ECT 313 (Elec. Microcomp. Sys I)	___3	_____
Electronics Technology Core (15 hours)		
__ECT 120 (Quan. Fund. of Elect.)	___3	_____
__ECT 211 (Electric Circuits I)	___3	_____
__ECT 212 (Electric Circuits II)	___3	_____
__ECT 312 (Electronic Devices & Cir. I)	___3	_____
__ECT 314 (Electronic Devices & Cir. II)	___3	_____
Colloquium Sequence		
__ECT 104 (Colloquium II)	___0	_____
ECIT Project Sequence (8 hours)		
__ECT 198(6) (Freshman Project)	___1	_____
__ECT 298 (Sophomore Project)	___2	_____
__ITT 398 (Junior Project)	___2	_____
__ITT 598 (Senior Project)	___3	_____
Information Technology Concentration (21 hours)		
__Computer Tech(2) or Telecom Tech(2)	___3	_____
__Computer Tech(2) or Telecom Tech(2)	___3	_____
__Computer Tech(2) or Telecom Tech(2)	___3	_____
__Computer Tech(2) or Telecom Tech(2)	___3	_____
__Computer Tech(2) or Telecom Tech(2)	___3	_____
__Computer Tech(2) or Telecom Tech(2)	___3	_____
__Computer Tech(2) or Telecom Tech(2)	___3	_____

**In order to graduate, each incoming student will be required to complete a three-hour course of African/African-American Studies and a three-hour course of Global Studies. And earn a minimum "C" grade required for all ECIT Project Sequence courses, Computer Technology Core courses, Electronics Technology Core courses, Mathematics and Physical Science Core courses, and Information Technology courses.

Note(s): (1) A prerequisite of CHEM 099 is recommended for students lacking high school Chemistry.
(2) See an advisor for a list of approved Computer Technology or Telecommunication Technology Electives.
(3) A prerequisite of MATH 110 is recommended for students lacking high school Advanced Algebra and Trigonometry.
(4) See an advisor for a list of approved Business, Management, and Economics Electives.
(5) See an advisor for a list of approved University Studies Theme Cluster Electives.
(6) It is highly recommended that students complete ECT 121 before enrolling into ECT 198.

Business, Management, and Economics (BME) Electives
for
The Department of Electronics, Computer, and Information Technology Paradigms

(Students must select at least 15 credits from the following list of courses)

ACCT 203 Fundamentals of Accounting for Decision Making

BUAD 220 Business Environment
BUAD 422 Management Concepts
BUAD 425 Entrepreneurship
BUAD 426 Organizational Behavior
BUAD 430 Marketing Concepts
BUAD 460 Special Topics in Entrepreneurship
BUAD 481 Management Science I

CM 592 Project Management

ECT 684 Energy and Environmental Policy
ECT 686 Energy Management and Environmental Impact in the Energy Market

ECON 200 Principles of Economics (Micro)
ECON 201 Principles of Economics (Macro)

INEN 260 Engineering Economy

ITT 320/620 Telecommunication Management
ITT 325/625 Computer Database Management
ITT 385 Economic and Social Impacts of Information Technology
ITT 600 Project Management for Information Technology
ITT 685 Ethical Issues in Information Technology

OSH 393 Safety Management

COURSE DESCRIPTIONS IN ELECTRONICS AND COMPUTER TECHNOLOGY (ECT)

Undergraduate

ECT 101. Microcomputer Applications **Credit 3(2-2)**
This course is designed to provide the student with basic computer skills as required in a typical business and technical environment. Emphasis is on business and technical software packages including spreadsheets, database management, word-processing, etc. as run on a Windows platform. Prerequisites: None **(F;S;SS)**

ECT 103. Colloquium I: University Experience **Credits 1(0-2)**
This colloquium will emphasize the role of the University Studies program and present a broad overview of the curriculum structure and rationale, including an introduction to a variety of interdisciplinary themes within the UNST program. Introductory discussions on ethics, wellness and healthy lifestyles, diversity and civic engagement will be included. In addition, this course provides a forum for dialogue among students, industry, and academia to work in partnership to define current and emerging issues in technology. Prerequisites: None **(F;S;SS)**

ECT 104. Colloquium II **Credit 0(0-1)**
This course is a continuation of ECT 103. It provides a forum for dialogue among students, industry, and academia to work in partnership to define current and emerging issues in technology. Prerequisites: ECT 103 **(F;S;SS)**

ECT 120. Quantitative Fundamentals of Electronics and Computer Technology **Credit 3(3-0)**
This course provides the quantitative background needed in the field of electronics, computer, and information technology. Topics include arithmetic review, algebra, basic trigonometry, complex algebra, statistics, and boolean algebra and fundamental units, as they relate to electronics, information and computer technology. Prerequisites: None **(F;S;SS)**

ECT 121. Electronic Circuit Fabrication Techniques **Credit 1(0-2)**
This course is designed to facilitate the integration of electronic circuit construction techniques into multiple electronic courses. This course is further designed to teach the student how to construct electronics circuits on breadboards and printed circuit boards. The students will also be exposed to the technique of hand soldering. Prerequisites: None **(F;S;SS)**

ECT 197. Co-Operative Training in Industry I **Credit 1(0-2)**
This course allows students to earn university credit while they are employed as an intern or on cooperative assignment in industry. Students must be employed for the entire semester on assignments that are representative of the student's field of study in the department. The student and employer will be required to submit reports and evaluations on the experience to the departmental internship coordinator by the conclusion of the semester the student enrolled into the course. Prerequisites: ECT 120 **(F;S;SS)**

ECT 198. Freshman Project **Credits 1(0-3)**
Under the direction and guidance of departmental faculty, the student will perform independently selected laboratory experiments to reinforce concepts and experimental techniques learned in the first year of study in the major. In addition, the student will build and test a series of approved software and electronic projects. Each project will be accompanied by an exam which will test the student's understanding of basic concepts underlying the project. Prerequisites: ECT 101, ECT 120, ECT 201, and ECT 211 **(F;S;SS)**

ECT 201. Introduction to Computer Programming **Credit 3(2-2)**
This course gives an introduction to computer programming. Topics include structured program development and the use of a high level programming language to develop software applications. Prerequisites: ECT 101. **(F;S;SS)**

ECT 203. Colloquium III **Credit 0(0-1)**
This course is a continuation of ECT 104. This course provides a forum for dialogue among students, industry, and academia to work in partnership to define current and emerging issues in technology. Prerequisites: ECT 104 **(F;S;SS)**

ECT 204. Colloquium IV **Credit 0(0-1)**
This course is a continuation of ECT 203. This course provides a forum for dialogue among students, industry, and academia to work in partnership to define current and emerging issues in technology. Prerequisites: ECT 203 **(F;S;SS)**

ECT 211. Electric Circuits I **Credit 3(2-2)**
This course is a study of the fundamentals of direct current electrical circuits. Topics include series, parallel, series-parallel networks, Ohm's Law, Kirchhoff's Laws, network theorems, and practical applications. Prerequisites: ECT 120, and MATH 110 or MATH 111. **(F;S;SS)**

ECT 212. Electric Circuits II **Credit 3(2-2)**
This course is a continuations of Electric Circuits I. Topics include network analysis, power factor correction, complex impedance, polyphase systems, filters, resonance, and simple dynamos. Prerequisite: ECT 211. **(F;S;SS)**

ECT 213. Digital Circuits **Credit 3(2-2)**
This course deals with digital logic fundamentals. Topics include combinational and sequential circuits and systems. Karnaugh maps and software tools are utilized. Prerequisite: ECT 211. **(F;S;SS)**

ECT 297. Co-Operative Training in Industry II **Credit 1(0-2)**
The description of this course is the same as ECT 197 and is normally the second co-op experience of the student. This course allows students to earn university credit while they are employed as an intern or on cooperative assignment in industry. Students must be employed for the entire semester on assignments that are representative of the student's field of study in the department. The student and employer will be required to submit reports and evaluations on the experience to the departmental internship coordinator by the conclusion of the semester the student enrolled into the course.
Prerequisites: ECT 197, ECT 212, ECT 213 **(F;S;SS)**

ECT 298. Sophomore Project **Credits 2(0-4)**
Under the direction and guidance of departmental faculty, the student will perform independently selected laboratory experiments to reinforce concepts and experimental techniques learned in the second year of study in the major. In addition, the student will build and test a series of approved software and electronic projects. Each project will be accompanied by an exam, which will test the student's understanding of basic concepts underlying the project. Prerequisites: ECT 212, ECT 213, ECT 312, and ECT 313**(F;S;SS)**

ECT 299. Survey of Electronics and Computer Technology **Credit 3(2-2)**
This course provides a comprehensive introductory survey of analog and digital electronics. Some of the topics covered in this course include: voltage, current, resistance, types of electronic components and circuits, semiconductor devices, and hands-on lab instructions. This course is intended as a bridge course for non-majors who are interested in taking more advance electronics, computer and information technology classes. **(F;S;SS)**

ECT 312. Electronic Devices and Circuits I **Credit 3(2-2)**
This course provides a comprehensive treatment of topics in electronic devices. Topics to be covered include basic to advance theories of electronics devices such as diodes, Bipolar-Junction transistors, and Operational amplifiers with hands on laboratories to be complemented by the use of software simulation packages. Prerequisites: ECT 212 or ECT 299**(F;S;SS)**

ECT 313. Electronic Microcomputer Systems I **Credit 3(2-2)**
This course addresses the programming and interfacing of 8-bit microcomputer based systems. Prerequisite ECT 213. **(F;S;SS)**

ECT 314. Electronic Devices and Circuits II **Credit 3(2-2)**
This course is a continuation of ECT 312. This course is designed to give the student an understanding of the fundamental theories and applications of electronic devices such as Junction Field-Effect Transistors, Metal Oxide Semiconductor Field-Effect Transistors, Operational Amplifiers, Thyristors, and active filters. The course will include hands on laboratories which will be complemented by the use of software simulation packages. Prerequisites: ECT 312 **(F;S;SS)**

ECT 330. Robotics and Controls I **Credit 3(2-2)**
This course deals with the fundamentals of first and second order electromechanical dynamic systems, frequency and time domain analysis of the systems, sensors and actuators, structure and specification of industrial robots, and robot control fundamentals.
Prerequisites: ECT 312, MATH 132 **(F;S;SS)**

ECT 334. Electronic Instrumentation **Credit 3(2-2)**
This course is designed to develop basic competencies related to components and circuits used in instrumentation to include basic transistor configurations; voltage regulators; integrated circuit operational amplifiers, amplifier feedback principles and DC to DC converters. Prerequisite: 312. **(F;S;SS)**

ECT 350. Communications Systems **Credit 3(2-2)**
This course investigates the fundamental concepts of electronic communications systems. Topics include: Amplitude Modulation (AM), Frequency Modulation (FM), Phase Modulation (PM), digital modulation schemes, principles of power spectra and time domain analysis. Prerequisite: ECT 312. **(F;S;SS)**

ECT 355. Electrical Power and Machinery **Credit 3(2-2)**
This course is a study of electrical machines and power systems. Topics include dc motors, single phase and 3 phase induction motors, synchronous generators, motor drives and power system transmission and distribution. Prerequisite: ECT 212 **(F;S;SS)**

ECT 360. Industrial Electronics and Controls **Credit 3(2-2)**
This course addresses the role of electronic circuits and control systems in industry. The topics include application of power semiconductor devices for conversion and control of electrical energy, electromechanical devices, fundamentals of open and closed loop control systems, process control, and Programmable logic controllers. Prerequisites: ECT 312 **(F;S;SS)**

ECT 397. Co-Operative Training in Industry III **Credit 2(0-4)**
The description of this course is the same as ECT 197 and is normally the third co-op experience of the student. This course allows students to earn university credit while they are employed as an intern or on cooperative assignment in industry. Students must be employed for the entire semester on assignments that are representative of the student's field of study in the department. The student and employer will be required to submit reports and evaluations on the experience to the departmental internship coordinator by the conclusion of the semester the student enrolled into the course. Prerequisites:
ECT 297, ECT 312 **(F;S;SS)**

ECT 398. Junior Project **Credits 2(0-4)**
Under the direction and guidance of departmental faculty, the student will perform independently selected laboratory experiments to reinforce concepts and experimental techniques learned during the third year of study. In addition, the student will build and test a series of approved software and electronic projects. Each project will be accompanied by a formal report on the project. Also examinations will be given to test the student's understanding of basic concepts underlying the projects. Technical writing and project management skills will be emphasized throughout the course. Prerequisites: Junior Standing **(F;S;SS)**

ECT 414. Introduction to Semiconductor Device Physics and Fabrication **Credit 3(2-2)**
The course provides basic treatment of the physics of semiconductor materials and of solid state electronics and photonic devices (eg. low frequency diodes, bipolar transistors, microwave Gunn diodes, semiconductor lasers, etc.). Techniques used in micro-, nano-, and mems- technologies for fabricating devices are detailed. Laboratory work includes simple measurements and tests of semiconductor materials and device characteristics. Prerequisites: Phys. 242, 252, ECT 314 **(F;S;SS)**

ECT 430. Robotics and Controls II **Credit 3(2-2)**
The course is the continuation of ECT 330. Emphasis of the course will be on the details of control systems, foundations and principle of robotic manipulation, and detailed case studies of the existing systems. The course will also discuss the programming, design and building of a prototype robot. Prerequisites: ECT 330 **(F;S;SS)**

ECT 460. Industrial Electronics and Controls II **Credit 3(2-2)**
This course is the continuation of ECT 360. Emphasis is on the analysis of complex industrial control systems, robotics, advanced topics in programmable logic controllers, and the role of electronics in industry. Prerequisites: ECT 360 **(F;S;SS)**

ECT 497. Co-Operative Training in Industry IV **Credit 2(0-4)**
This course allows students to earn university credit while they are employed as an intern or on cooperative assignment in industry. Students must be employed for the entire semester on assignments that are representative of the student's field of study in the department. The student and employer will be required to submit reports and evaluations on the experience to the departmental internship coordinator by the conclusion of the semester the student enrolled into the course. Prerequisites: ECT 397 **(F;S;SS)**

ECT 498. Co-Operative Training in Industry V **Credit 2(0-4)**
The description of this course is the same as ECT 497. This course allows students to earn university credit while they are employed as an intern or on cooperative assignment in industry. Students must be employed for the entire semester on assignments that are representative of the student's field of study in the department. The student and employer will be required to submit reports and evaluations on the experience to the departmental internship coordinator by the conclusion of the semester the student enrolled into the course. Prerequisites: ECT 497 **(F;S;SS)**

ECT 598. Senior Project: A Capstone Experience **Credit 3(0-6)**
Under the direction and guidance of departmental faculty, the student will perform independently selected laboratory experiments to reinforce concepts and experimental techniques learned during the fourth year of study. In addition, the student will build and test a series of approved software and electronic projects. Each project will be accompanied by a formal report on the project. Also examinations will be given to test the student's understanding of basic concepts underlying the projects. Technical writing and project management skills will be stressed throughout the semester. Prerequisites: Senior Standing **(F;S;SS)**

ECT 599. Independent Study **Credit 3(0-6)**
The student selects a technical problem in electronics or computer technology for special research and study in consultation with a faculty member in area of interest. The student will spend a minimum of six (6) hours per week in library research or laboratory experimentation. A technical report in standard format is required for completion and approved by faculty. Prerequisite: Junior or senior standing with Department Chair approval. **(F;S;SS)**

Undergraduate/Graduate

ECT 600. Electromechanical Systems Analysis **Credit 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 **(F;S;SS)**

ECT 614. Microelectronic Fabrication Technology **Credit 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. **(F;S;SS)**

ECT 615. Introduction to Semiconductor Manufacturing Equipment Technology **Credit 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 **(F;S;SS)**

ECT 616. Applied Materials, Semiconductors, and Superconductivity **Credit 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 **(F;S;SS)**

ECT 617. Advanced Solid State Devices **Credit 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 **(F;S;SS)**

ECT 635. Analysis and Design of Mechatronic Systems **Credit 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. **(F;S;SS)**

ECT 640. Electronic Automated Testing Systems **Credit 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. **(F;S;SS)**

ECT 645. Power Electronics I **Credit 3(2-2)**
This course addresses the principles and applications of Power Electronics. Topics include power semiconductor switches, phase-controlled rectifiers, DC-to-DC converters, DC-to-DC inverters, motor drives, and power quality. Prerequisites: ECT 314 and ECT 355 or Graduate Standing **(F;S;SS)**

ECT 681. Power System Analysis and Control **Credit 3(3-0)**
This course covers the development of methods for power system analysis and control. An analysis and implementation of systems for steady state, transient, and dynamic conditions will be studied. Digital solutions will be emphasized. Prerequisites: ECT 355 **(F;S;SS)**

ECT 682. Controls and Applications of Electric Machines **Credit 3(3-0)**
This course will cover the dynamics and control of different applications of electric machines, such as DC machines, synchronous machines, polyphase induction machines and fractional horsepower machines. This course will investigate the dynamics and control of electric machines driven by electronic power converters.
Prerequisites: ECT 355 **(F;S;SS)**

ECT 683. Electric Power Quality for the Digital Economy **Credit 3(3-0)**
This course will cover the causes, consequences and solutions of power quality problems that affect the operation of computerized processes and electronic systems. This course will discus the industry standards, monitoring techniques and economic consideration of power quality issues. Prerequisites: ECT 355 **(F;S;SS)**

ECT 684. Energy and Environmental Policy **Credit 3(3-0)**
This course covers the development and current status of energy sources, technologies, consumption patterns, conservation and energy policies. The course will place emphasis on the environmental effects of various choices made at each step of the energy cycle. The course will also examine those choices from technological and socioeconomic points of view. Prerequisites: ECT 355 **(F;S;SS)**

ECT 685. Energy Power and the Environment **Credit 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 **(F;S;SS)**

ECT 686. Energy Management and Environmental Impact in the Energy Market **Credit 3(3-0)**
The purpose of this course is to provide state-of-the-art education in the field of power generation and energy utilization in a deregulated competitive energy services market. Important energy related problems with considerable impact to the environment with main issues: conversion of energy resources, likewise distribution, transport and end-use of energy in different sectors are covered. Prerequisites: ECT 355 **(F;S;SS)**

ECT 690. Special Problems in Electronics and Computer Technology **Credit 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. **(F;S;SS)**

ECT 695. Alternate Energy Systems **Credit 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 **(F;S;SS)**

ECT 699. Independent Study in Electronics and 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. **(F;S;SS)**

Graduate

ECT 714. Advanced VLSI, Film, and IC process Technology **Credit 3(3-0)**
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 **(F;S;SS)**

ECT 717. Special Problems in Electronics and Computer Technology **Credits 3(0-6)**
This course involves the study of a special problem not addressed by an existing course in the department. Typically, a problem is selected from within a new or evolving area in the field. Prerequisites: Approval of Departmental Chairperson **(F;S;SS)**

ECT 730. Systems Integration for Telecommunications Managers **Credit 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 **(F;S;SS)**

ECT 735. Telecommunication Management Issues **Credit 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 **(F;S;SS)**

ECT 740. Regulatory and Policy Issues for Communication Systems **Credit 3(2-2)**
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 **(F;S;SS)**

ECT 750. Telecommunications Co-op **Credit 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. **(F;S;SS)**

ECT 759. Special Topics in Electronics and Computer Technology **Credit 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. **(F;S;SS)**

ECT 764. Graduate Independent Study **Credits 3(0-6)**
This is an independent study in which the graduate student selects a problem (technical or managerial) in consultation with a faculty member in an area related to Electronics Technology or Computer Technology, Telecommunications or Networking. The student along with the faculty member defines the problem's objectives and a solution is pursued. Prerequisites: Graduate Standing **(F;S;SS)**

ECT 785. Electric Energy and Environmental Management **Credit 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 **(F;S;SS)**

ECT 788. Master's Comprehensive Exam **Credit 0(0-1)**
This course will aid in the preparation of the graduate student to take the Master of Science in Industrial Technology (MSIT) comprehensive examination. The examination will be administered towards the end of the semester or summer session. This course will be graded on a Pass/Fail basis. The passing of this course is a requirement for graduation from the MSIT program. Prerequisites: 24 credit hours of graduate level courses. **(F;S;SS)**

ECT 793. Master's Supervised Teaching I **Credits 2(0-4)**
This course introduces the master's student to laboratory teaching under the supervision of a faculty mentor. Master's students who serve as teaching assistants or as instructors are required to take this course during the first semester they teach. Topics include laboratory planning, writing learning objectives, teaching pedagogy, characteristics of good teachers, and formative and summative assessment techniques. Prerequisites: Consent of Advisor **(F;S;SS)**

ECT 794. Master's Supervised Teaching II **Credits 2(0-4)**
This course continues the student's laboratory teaching experience under the supervision of a faculty mentor. Master's students who serve as teaching assistants or as instructors are required to take this course during the second semester they teach. Topics include laboratory planning, writing learning objectives, teaching pedagogy, characteristics of good teachers, and formative and summative assessment techniques. Prerequisites: Consent of Advisor and ECT 793 **(F;S;SS)**

ECT 795. Master's Supervised Teaching III **Credits 2(0-4)**
This course completes the student's laboratory teaching experience under the supervision of a faculty mentor. Master's students who serve as teaching assistants or as instructors are required to take this course during the third semester they teach. Topics include laboratory planning, writing learning objectives, teaching pedagogy, characteristics of good teachers, and formative and summative assessment techniques. Prerequisites: Consent of Advisor and ECT 794 **(F;S;SS)**

Undergraduate

ITT 236. Applied C Programming I **Credit 3(2-2)**
This course covers the study of programming language structure concepts for microcomputers. The course emphasizes programming in C and its application to software and hardware development for technological applications. Topics covered in the course include C operators, flow control statements, function, pointers and arrays, I/O structures and library routines. Prerequisites: ECT 201 **(F;S;SS)**

ITT 237. Applied C++ Programming I **Credit 3(2-2)**
This is an introductory course in computing in C++. The course places emphasis on algorithm development and problem solving. Particular elements include: careful and methodical development of C++ programs from specifications; documentation and style; appropriate use of control structures, data types and subprograms; data abstraction and verification; numeric and nonnumeric applications; introduction to object-oriented programming and design. Prerequisites: ECT 201 **(F;S;SS)**

ITT 238. Applied RPG Programming I **Credit 3(2-2)**
This course introduces computer programming using the Report Program Generator (RPG) programming language. Topics include input/output operations, sequence, selection, iteration, arithmetic operations, arrays/tables, and other related topics. Upon completion, students should be able to design, code, test, and debug RPG language programs. Prerequisites: ECT 201 **(F;S;SS)**

ITT 239. Applied Visual Basic Programming I **Credit 3(2-2)**
A course covering the fundamentals of the Windows GUI (Graphical User Interface) operating system and Visual Basic as a Windows-based application development language. This course will use practical problems to illustrate application-building techniques as well as take advantage of new capabilities of building applications in a graphical environment, such as building special-purpose, professional-looking applications. Topics include input/output operations, sequence, selection, iteration, arithmetic operations, arrays, forms, sequential files, and other related topics. Prerequisites: ECT 201 **(F;S;SS)**

ITT 240. Applied JAVA Programming **Credit 3(2-2)**
The course provides a comprehensive overview of basic programming concepts, the Java programming language using an object-oriented approach, and the software development life cycle. The course emphasizes problem solving and good practices for program construction, documentation, testing, and debugging. Prerequisites: ECT 201 **(F;S;SS)**

ITT 301. Hardware and Software Installation and Maintenance **Credit 3(2-2)**
This course will introduce the student to the practical hardware and software aspects of personal computers. Topics include operating systems, installation of software and hardware, configuration, troubleshooting, I/O and basic networking. Prerequisites: ECT 213 and Sophomore Standing **(F;S;SS)**

ITT 303. Introduction to High Performance Computing **Credit 3(2-2)**
This course provides an overview of the basic system, network, security, and programming aspects of High Performance Computing. Students will be introduced to the advantages and disadvantages of various machine architectures, programming models, and problem types. Students will learn basic high performance computing cluster configuration and use. Prerequisites: ECT 213 **(F;S;SS)**

ITT 304. High Performance Computing Architecture and System Administration **Credit 3(2-2)**
Topics covered in this course include: classification and management of clusters, an in-depth study of the system board components and memory management, supporting input and output devices, troubleshooting and disaster recovery techniques, working with high-speed networks, distributed and shared memory systems, hardware design issues, vector parallel machines and communication issues of remote massively parallel machines and clusters, and the assembly and maintenance of high performance computing clusters. Prerequisites: ITT 303 **(F;S;SS)**

ITT 320. Telecommunications Management **Credits 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: Junior Standing **(F;S;SS)**

ITT 325. Computer Database Management **Credits 3(2-2)**
This course focuses exclusively on the design and system issues related to distributed database systems. Students will learn the usage of different design strategies for distributed databases, and they will study query processing techniques and algorithms as well as transaction management and concurrency control concepts used in such systems. Design and implementation issues related to multi-database systems also will be discussed. In addition, the course focuses on applying the techniques learned in the course to commercial database management systems. Prerequisites: none **(F;S;SS)**

ITT 329. Computer Networking I **Credit 3(2-2)**
This course introduces the student to Local Area Networks (LAN) and introduction to Wide Area Networks (WAN). The course also will provide the basic understanding of network concepts and router programming. Prerequisites: ECT 212 and ECT 213 or ECT 299 **(F;S;SS)**

ITT 330. Computer Networking II **Credit 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: ITT 329 **(F;S;SS)**

ITT 337. Applied C++ Programming II **Credit 3(2-2)**
This course is a continuation of ITT 237 using C++ with structured programming principles. The course will solve representative technology problems using advanced C++ commands, with a focus on: writing in object oriented style, computer control of input/output port control, stand-alone executable code, and library linking for various applications. Prerequisites: ITT 237 **(F;S;SS)**

ITT 338. Applied RPG Programming II **Credit 3(2-2)**
This course is a continuation of ITT 238 using RPG with structured programming principles. Emphasis is placed on advanced arrays/tables, file management/processing techniques, sub-programs, interactive processing, sort/merge routines, and libraries. Upon completion, students should be able to design, code, test, debug, and document programming solutions. Prerequisites: ITT 238 **(F;S;SS)**

ITT 339. Applied Visual BASIC Programming II **Credit 3(2-2)**
This course is a continuation of ITT 239. The topics of the course are designed to provide the Visual Basic student with knowledge of additional tools, advanced concepts, and code syntax to create Visual Basic programs that conform to the Windows standards. The intent is to provide the student with advance knowledge to create programs that meet the demand of today's information technology environment. Prerequisites: ITT 239 **(F;S;SS)**

ITT 340. Introduction to Mainframe Operations **Credit 3(2-2)**
This course is an introduction to mainframe operations including concepts and functions of the OS/MVS operating system. Topics include virtual storage, Job Control Language (JCL), data management, data set organization, compilers, and linkage editor. Additional, topics include JOB card, EXEC card, DD card (including DSN, DISP, UNIT, SPACE, and DCB), instream data, partitioned data sets, temporary and cataloged sequential data sets, and cataloged procedures. Prerequisites: Junior Standing **(F;S;SS)**

ITT 350. Introduction to DB2 Concepts **Credit 3(2-2)**
This course presents the basic structure, concepts, and facility of the DB2 UDB for OS/MVS database management system and introduces the Structured Query Language (SQL). Other subjects covered include relational database concepts, security design, concurrency concepts, database components, available administration and development facilities, catalog tables, and unit-of-work processing with commit and rollback. Factors that affect the performance of DB2 applications and the use of OS/MVS system resources are explained and options for application performance monitoring and tuning are discussed. Prerequisites: Junior Standing **(F;S;SS)**

ITT 355. Network Servers **Credit 3(2-2)**
This course covers the activities and methods required to assure productive and reliable operation of network servers. Topics include planning, installing, configuring, and maintaining servers, including knowledge of server-level hardware implementations, operating systems, data storage subsystems, data recovery, and I/O subsystems. Upon completion, students should be able to configure and maintain a network server. Prerequisites: Junior Standing **(F;S;SS)**

ITT 385. Economic and Social Impacts of Information Technology **Credits 3(2-2)**
This course is designed to assess critically the institutional forces that shape and create the demand for information technology (IT). It will also discuss how the consumption of IT impacts the economy and society. This course will help participants think about how changing social and economic conditions determine what technologies are consumed and how they are consumed, who consumes them and where they are consumed. Prerequisites: Junior Standing **(F;S;SS)**

ITT 398. Junior Project **Credits 2 (0-4)**
Under the direction and guidance of departmental faculty, the student will perform independently selected laboratory experiments to reinforce concepts and experimental techniques learned in the first two years of study in the major. In addition, the student will build and test project(s). Prerequisites: Junior Standing **(F;S;SS)**

ITT 401. Introduction to Parallel Programming **Credit 3(2-2)**
This course covers parallel computing fundamentals including models of parallel computing, architecture taxonomy, memory architecture, performance, design, and scalability considerations, parallel programming paradigms, techniques and issues in parallel program creation, and parallel programming examples.
Prerequisites: ECT 201 or consent of instructor **(F;S;SS)**

ITT 413. Electronic Microcomputer Systems II **Credit 3(2-2)**
Advanced microprocessor and microcomputer structures involving DSP-based systems and/or other powerful processors (eg. the Intel StrongArm). Advanced techniques of pipelining, parallel processing etc. are illustrated. Programming and design of hardware interfaces. The emphasis of the course is on student projects. Prerequisites: ECT 313. **(F;S;SS)**

ITT 420. Introduction to Unix/Linx **Credit 3(2-2)**
The course will cover network management utilizing various Unix products, such as Linux and Solaris operating systems. Topics will include networking operating system (NOS) setup, network resource management, user and group management, and the security model. Prerequisites: ECT 201 **(F;S;SS)**

ITT 423. Computer Systems Architecture **Credit 3(2-2)**
This course introduces the organization and design philosophy of computer systems with respect to resource management, throughput, and operating system interaction. Topics include instruction sets, registers, data types, memory management and hierarchy, virtual memory, cache, storage management, vector and multi-processing, CPU design, arithmetic algorithms, I/O communication techniques, RISC architectures, and pipelining.
Prerequisites: ECT 313 **(F;S;SS)**

ITT 430. Linux Systems Administration **Credit 3(2-2)**
This course presents the fundamental knowledge and skills needed to install, manage, and maintain a Linux Operating System. Students will learn to install the system, add users, configure devices, and maintain system security. Prerequisites: ITT 420 **(F;S;SS)**

ITT 431. Advanced Programming Techniques with an OOP Language **Credit 3 (2-2)**
This course uses programming examples (employing an object-oriented programming language such as Visual C++ / J++ to introduce concepts in advanced data structures (stacks, queues, trees, graphs, hash tables, etc.) and algorithms (sorting, searching, etc.). Object-oriented programming techniques are also detailed. Application to design of large scale programs and software engineering.
Prerequisite: ECT 201 **(F;S;SS)**

ITT 598. Senior Project: An Information Technology Capstone Experience **Credit 3(0-6)**
Under the direction and guidance of departmental faculty, the student will perform independently selected information technology (IT) laboratory experiments to reinforce concepts and experimental techniques learned during the four years of study. In addition, the student will build and test a series of approved IT projects. Each IT project will be accompanied by a formal report on the project. Also, examinations will be given to test the student's understanding of basic concepts underlying the projects. Technical writing and IT project management skills will be stressed throughout the course. Prerequisites: Senior Standing **(F;S;SS)**

Undergraduate/Graduate

ITT 600. Project Management for Information Technology **Credit 3(3-0)**
This course delves into the unique challenges of managing information technology projects, and offers a road map to success. The course is specifically designed to address the skills inventory and performance outcomes that a student needs to be successful in today's volatile information technology market. Prerequisite: Senior standing **(F;S;SS)**

ITT 601. Wireless Application Protocols **Credit 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 **(F;S;SS)**

ITT 605. Principles of Computer Networking **Credit 3(2-2)**
This course explores all the hardware and software that drives local and Internet computing. Special emphasis is placed on connectivity and throughput. Prerequisites: ECT 313 **(F;S;SS)**

ITT 610. Digital Communications I **Credit 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 **(F;S;SS)**

ITT 611. Digital Communications II **Credit 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 **(F;S;SS)**

ITT 615. Networking Security Applications **Credit 3(2-2)**
This course explores security terms, definitions, concepts, and issues that face industries today. This course also will examine how the concept of security, and being secure, integrates into the overall enterprise mission. The importance of user involvement, security training, ethics, trust, and informed management will be explored. Prerequisites: ITT 605 **(F;S;SS)**

ITT 620. Telecommunications Management **Credit 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. **(F;S;SS)**

ITT 625. Computer Database Management **Credit 3(2-2)**
This course focuses exclusively on the design and system issues related to distributed database systems. Students will learn the usage of different design strategies for distributed databases, and they will study query processing techniques and algorithms as well as transaction management and concurrency control concepts used in such systems. Design and implementation issues related to multidatabase systems also will be discussed. In addition, the course focuses on applying the techniques learned in course to commercial database management systems. Prerequisites: ITT 600 **(F;S;SS)**

ITT 629. Computer Networking I **Credit 3(2-2)**
This course introduces the student to Local Area Networks (LAN) and introduction to Wide Area Networks (WAN). The course also will provide the basic understanding of network concepts and router programming. Prerequisite: ECT 212 and ECT 213 or ECT 299 **(F;S;SS)**

ITT 630. Computer Networking II **Credit 3(1-4)**
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: ITT 629. **(F;S;SS)**

ITT 634. Electronic Instrumentation for Remote Sensing Applications **Credit 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 **(F;S;SS)**

ITT 635. Administration and Security of Wireless Local Area Network I **Credit 3(2-2)**
This course will introduce students to wireless network protocols, access modes, portable communications and computing devices, management tools, security solutions, and current industry best practices for managing wireless networks in a secure environment. Case studies will be used throughout the course. Prerequisites: ECT 350 **(F;S;SS)**

ITT 640. Administration and Security of Wireless Local Area Network II **Credit 3(2-2)**
A continuation of ITT 635, this course provides students with an in-depth understanding of the security vulnerabilities to wireless networks and their corresponding countermeasures. This course includes training on practical methods for designing, configuring, testing, and maintaining wireless networks appropriate to their organizations' operating requirements. Prerequisites: ITT 635 **(F;S;SS)**

ITT 645. Analysis and Troubleshooting of Wireless LAN Systems **Credit 3(1-4)**
This course presents an in-depth understanding of the frame structure of 802.11 frames, frame exchange processes between wireless nodes, analyzing security solutions for both effectiveness and weaknesses, analyzing performance in both pure and mixed-mode environments, and using analyzers for site surveying and intrusion detection. ITT 635 **(F;S;SS)**

ITT 646. Wireless Computer Networking I **Credit 3(2-2)**
This course covers a broad range of wireless computer networking topics including Wi-Fi, Bluetooth, WiMAX, ZigBee, and infrared wireless technology. The course covers wireless technologies and standards, hardware and software installation, radio frequency (RF) fundamentals, and wireless applications support and security.
Prerequisites: ECT 350 **(F;S;SS)**

ITT 650. Wireless Communication Systems I **Credit 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 **(F;S;SS)**

ITT 655. Optical Communication Systems I **Credit 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 **(F;S;SS)**

ITT 660. Satellite and Personal Communication Systems **Credit 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 **(F;S;SS)**

ITT 665. Wireless Geo-location Systems I **Credit 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 **(F;S;SS)**

ITT 670. Communication Circuit Development Laboratory I **Credit 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. **(F;S;SS)**

ITT 675. Video Communication Systems **Credit 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. **(F;S;SS)**

ITT 680. Radio Wave and Optical Signal Propagation **Credit 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. **(F;S;SS)**

ITT 684. Introduction to Optical Information Processing **Credit 3(2-2)**
This course will cover modern wave optics. In addition, the course will also cover the application of Fourier transforms to image analysis, optical spatial filtering, and image processing. Prerequisites: ECT 350 **(F;S;SS)**

ITT 685. Ethical Issues in Information Technology **Credit 3(3-0)**
This course explores issues on the interface between information technology and society, with a special focus on ethical issues. Topics include ethical theory, privacy and security, spam, electronic commerce, the digital divide, open source software, medical informatics, bioinformatics, actor-network theory, ethnomethodology, and some neo-classical economics. Prerequisite: Senior Standing **(F;S;SS)**

ITT 688. Microwave and Radar Systems Analysis **Credit 3(2-2)**
This is an advanced course in microwave and radar systems analysis with application to airborne and navigation systems. Prerequisites: ECT 314, ECT 350 **(F;S;SS)**

ITT 689. Antenna Systems Technology **Credit 3(2-2)**

The course provides knowledge in general properties of antennas, the electromagnetic theory behind their operation, and an overview of different antenna systems. Equal weight is placed on the electromagnetic aspects important for antenna design and on systems aspects. Among the systems discussed are radar, cellular, and adaptive antenna systems. Prerequisites: ECT 350 **(F;S;SS)**

Graduate

ITT 725. Wide Area Networks **Credit 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 **(F;S;SS)**

ITT 745. Network Services for the Enterprise **Credit 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 **(F;S;SS)**

ITT 755. Optical Communication Systems II **Credit 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 **(F;S;SS)**

ITT 760. Wireless Communication Systems II **Credit 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 **(F;S;SS)**

ITT 765. Wireless Geo-location Systems II **Credit 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 **(F;S;SS)**

ITT 770. Communication Circuit Development Laboratory II **Credit 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 (F;S;SS)

LABORATORY FACILITIES

Nearly every course in Electronic, Computer, and Information Technology Department is enhanced with hands-on experimentation. It is important that students understand the importance of lab work.

The following are brief descriptions of Electronic, Computer, and Information Technology laboratories.

1. Basic Electricity Lab (202 Price Hall): This lab is equipped with basic analog and digital instruments and trainers to be used in introductory analog and digital courses. Instruments include analog and digital VOM, dual channel scopes, and analog, digital trainer. In addition a small workstation including a digital scope, spectrum analyzer, and satellite tracking station are available for students projects.

2. AT&T Computer Lab (201-B Price Hall): This lab is equipped with 20 PC stations. All PC's are loaded with modern software and simulation programs and computer-aided design that are used for circuit analysis and design. This lab provides students access to the internet.

3. Lucent Technologies Basic Electronics Lab (4008 Smith Hall): This lab is a general-purpose laboratory and can be used for many ECT Courses. The stations include prefabricated circuits, signal generators, power sources, scopes, DVMs, etc. Students use prefabricated circuit modules to build circuits, analyze and troubleshoot.

4. Digital/Microprocessor Lab (205 Price Hall): This lab equipped with digital and microprocessor hardware with 6800/68000 Trainers. This lab provides for interfacing microprocessors and microcontrollers to the analog world.

5. Industrial Controls Lab (4001 Smith Hall): The Industrial Controls lab allows students to experiment with circuits and systems for aligning, troubleshooting, and understanding the performance of robotics, servosystems, and motion control systems. Students study the characteristics and applications industrial robotics, programmable logic controllers (PLCs); and other industrial control systems.

6. Advanced Computer Networking Lab (4016 Smith Hall): This lab is equipped with 20 networked workstations loaded with software to enable activities in artificial intelligence, networking and data communication.

7. Wireless Geo-location Systems Research Lab (205-F Price Hall): This laboratory is located at the university in Smith/Price Hall Complex and supports funded research in navigation and navigation education. The laboratory is capable of conducting a variety of Global Positioning Systems related research including: low signal navigation technology research, GPS jamming research, and Improved techniques for high precision GPS point positioning and GPS precise ephemeris generation.

8. Hewlett Packard and Agilent Technologies Electronic Communication Lab (4007 Smith Hall): This laboratory supports the study of various communication circuits and systems.

Department of Electronics, Computer, and Information Technology Academic Policies and General Information

Part I: Academic Policy for student earning a B.S. in Electronics Technology with a concentration in Computational Technology, i.e. 0289 major code:

1. Electronics, Computer and Information Technology students earning a Bachelor of Science in Electronics Technology with a concentration in Computational Technology entering Fall 2004 and after must earn a grade of "C" or better in all courses in the major and in all mathematics and science (chemistry, physics) courses required for graduation.
2. Electronics, Computer and Information Technology students earning a Bachelor of Science in Electronics Technology with a concentration in Computational Technology will receive the same grade in the lecture and laboratory sections of ECT and ITT courses.
3. A 2.0 overall GPA will be required for current NCA&TSU students to transfer to the Bachelor of Science in Electronics Technology with a concentration in Computational Technology.

Part II: Academic Policy for student earning a B.S. in Electronics Technology (General concentration), i.e. 0184 major code:

1. Electronics, Computer and Information Technology students earning a Bachelor of Science in Electronics Technology with an undesignated concentration must earn a grade of "C" or better in all courses in the major.
2. Electronics, Computer and Information Technology students earning a Bachelor of Science in Electronics Technology with an undesignated concentration will receive the same grade in the lecture and laboratory sections of ECT and ITT courses.
3. A 2.0 overall GPA will be required for current NCA&TSU students to transfer to the Bachelor of Science in Electronics Technology with an undesignated concentration.

Part III: Academic Policy for student earning a B.S. in Electronics Technology with a concentration in Information Technology, i.e. 0290 major code:

1. Electronics, Computer and Information Technology students earning a Bachelor of Science in Electronics Technology with a concentration in Information Technology entering Fall 2004 or after must earn a grade of "C" or better in all courses in the major and in all mathematics and science (chemistry, physics) courses required for graduation.
2. Electronics, Computer and Information Technology students earning a Bachelor of Science in Electronics Technology with a concentration in Information Technology will receive the same grade in the lecture and laboratory sections of ECT and ITT courses.
3. A 2.5 overall GPA will be required for current NCA&TSU students to transfer to the B.S. in ET-IT concentration.

SUPPLIES

University policy requires that students supply textbooks and supplies for courses as required. The University bookstore is one place to obtain these materials. Students are expected to purchase textbooks and supplies immediately after the first class meeting. Students in Electronics are expected to obtain a graphic scientific calculator. A set of hand tools (such as wire cutters, soldering iron, etc.) may be required for some courses.

TOWN MEETING

The department sponsors at least one Town Meeting each academic year to apprise students of changes in the department, to promote student feed-back and to acquaint students with departmental personnel. Watch the departmental bulletin board for date, time and location.

WEB PAGE
The latest information about the Department can be obtained from our website: http://www.ncat.edu/~ecit.

E-MAIL ACCOUNTS
All students are encouraged to obtain e-mail accounts for the purpose of communicating with faculty and other students. Accounts are available free from the Computer Center.

STUDENT CLUBS

- Electronics Club
  Pick up a membership application from Dr. Brown, (336) 334-7717 ext. 2260.

- The Instrumentation, Systems, and Automation Society
  Contact Dr. Edgal for more information, (336) 334-7717 ext. 2235.

- National Association of Radio and Telecommunication Engineers
  Contact Ms. Lemons or Mr. Avery for more information, (336) 334-7717 ext. 2258.

DEPARTMENTAL NEWSLETTER
A departmental newsletter is published at least once a semester. Students are responsible for this publication.

NATIONAL ASSOCIATIONS
Students are encouraged to join local chapters of NARTE, ISA and IEEE.

Typical Class Day

ECIT majors can expect to take between 15 to 18 credits a semester. With labs, they can expect to spend about 20 hours in formal classroom or lab instruction each week. Out-of-class work will account for another 20 to 30 hours, but is dependent upon the student. Average class size is under 25 with many under 20.

Expenses

ECIT majors can expect their expenses to be for books, software, and very limited lab fees. It is estimated that $600 a semester should be budgeted. A campus-compatible laptop computer with wireless connection is required.

Regulations of the Transfer of Credits from Community Colleges and other Universities

Approved courses that are completed with a grade of C or better will transfer, the general faculty policy is that courses that are similar in content to courses offered by North Carolina A&T will transfer. Students transferring into North Carolina A&T State University are allowed a maximum of 64 credit hours from a community college. From a four year college or university, you can transfer a maximum of 80 credit hours. Students who have attended a combination of a two-year and four-year college may transfer up to 80 credit hours. Please be aware that only the credit(s) will transfer; the grades do not transfer.

Following admission to the University, you will be mailed a Transfer Equivalency Worksheet, which shows all courses transferred and their North Carolina A&T equivalencies. Prior to registration, your faculty adviser will meet with you to go over exactly how your transfer credits will apply toward your degree at North Carolina A&T.

After enrolling at North Carolina A&T, you may be permitted (subject to approval by your faculty adviser) to take additional courses at another institution provided that you have taken, and passed, at least one course at North Carolina A&T, and have completed the Permission Form. This is a way of pre-approving your course(s).

Instructions on How to Transfer Course Work

To ensure that the course(s) you decide to take at another institution transfer back to North Carolina Agricultural & Technical State University, just follow the instructions outlined below.

- Request a catalog or summer bulletin from the school you plan to attend. Summer bulletins are generally available in mid-March or April. You may attend any 2- or 4-year accredited school.

- Pick up a Permission Form from the Office of Admissions or the department of your Major/Minor.

- Pick out the course(s) you wish to take. The rule of thumb is that courses that are similar in content to the courses offered by NC A&T SU are considered transferable. Be aware of the fact that you cannot earn credit for a similar course that you successfully completed here.

- List the courses you may want to take on the Permission Form (you may wish to have a few courses approved in the event of a schedule change or course cancellation), and attach the course descriptions. All courses must be approved by your Department Chairperson.

- Make two (2) copies of the completed and signed Permission Form and distribute as follows:
  - Submit original to the Office of Admissions
  - Give one to your department
  - Keep one for your records

- Upon completion of the course(s), ask the Registrar at the visiting school to send an official transcript to: School of Technology, 203 Price Hall, North Carolina Agricultural & Technical State University, Greensboro, NC 27411.

- Approved courses that are completed with grades of "C" or better will transfer. Please note: Only the credit will transfer. The grades do not transfer and will not affect your GPA; the grades cannot replace grades earned at North Carolina Agricultural & Technical State University.

As always - if you have any questions, please see your faculty adviser in the department of your major.

Permission Form

This form must be prepared with all required signatures and filed with the Office of Admissions before a student enrolls in substitute courses. The University will not accept credits earned at another school while a student is on academic probation (unless approved by the Department Chairperson and School/College Dean), under academic or social suspension, on academic dismissal, or is concurrently registered at North Carolina Agricultural and Technical State University. **No credit is awarded for a course in which a grade below "C" was earned.**

_____

Name Social Security Number

_____

Street Address

_____

City State Zip Code

The above-mentioned student has been granted permission to take course(s) at:

_____

Name of College

_____

Address of College

Fall _____ Spring_____ Summer_____ 20___

Visiting School			**North Carolina A&T Equivalent**		
Course Number	Course Title	Hours	Course Number	Title	Hours

Approved by: _____ _____

Departmental Chairperson Date

Make two (2) copies of this form and distribute as follows:

-Submit Original to the Office of Admissions
- Give one to your department
- Keep one for your records

COOPERATIVE EDUCATION PROGRAM
OVERVIEW

What is Cooperative Education?

Cooperative Education is a carefully organized and supervised program of *experiential learning* in which the participating student enriches his/her education by alternating periods of study with periods of meaningful work. It has been defined by the National Commission for Cooperative Education as follows:

*It is that educational plan which integrates classroom experience and practical work experience in industrial, business, government, or service-type work situations. The work experience constitutes a regular and essential element in the educative process and some minimum amount of work experience (at least two different periods of work totaling at least 16 weeks) and minimum standards of performance are included in the requirements of the institution for a degree. In addition, there must be liaison between the administration of the institution and the employing firm. The essential criteria are that the work experience be considered an integral part of the education process, and that the institution takes a definite responsibility for this integrati*on. (Wilson, J.W. and Lyons, E.H., Work-Study College Program, New York: Harper Brothers Publishers, 1961, p. 19)

The term cooperative education suggests a dependency upon the cooperation of outside employers and educational centers in combining their resources to produce a more effective total educational experience for the student.

In summary, Cooperative Education is supervised employment in an occupational field that enhances learning, vocational adaptations, and enables the student to become better acquainted with both theory and practice as he/she makes the transition from campus life to "real" life in the world of work.

Regulations and Responsibilities

The success of a cooperative education program depends on a strong three-way relationship between the student, the University, and the employer. The reputation of the University rests heavily upon the performance standards set by the co-op student. The establishment and maintenance of this relationship are the responsibility of the Office of Career Services (OCS). This relationship is accomplished by personal contract with the student and with the employer, and by adherence to certain basic procedures. All Co-op work experiences must be arranged through the Office of Career Services.

Registered co-op students are considered to be full-time students in good standing with the University, while on campus and off campus on work assignments. Although no formal work agreement is signed by the student or the employer with the University, co-op students are expected to be on the job regularly and punctually. Students are paid employees and, therefore, have only those privileges that are allowed other employees. A co-op student may be terminated by the employer if his/her performance does not prove to be satisfactory. The student should notify the Assistant Director of Experiential Learning if his/her employment status change.

How to Apply for A Co-op Assignment

The Co-op Program is non-compulsory. Students interested in participating in the Program must establish and maintain at least a 2.0 overall grade point average. Freshmen must complete the freshman year prior to the first work assignment and transfer students must complete one semester.

Selections are made by the employer. Academic standing, interests, work experience and community involvement are important in making the decision. If extended an offer, students have the option to accept or decline. Students should not accept co-op positions if they do not intend to follow a previously arranged work schedule. We strongly encourage students to participate in two to three co-op assignments prior to graduation.

REGISTRATION—To be considered for a co-op, registration with the Office of Career Services is required. Registration instructions and materials are located in Room 101 Murphy Hall and on-line.

INTERVIEWING—Students should interview the semester before they actually plan to begin work. Criteria established by the employer will be published in the OCS Recruitment Bulletin and on-line. Only students who meet the criteria will be allowed to interview. Positions are highly competitive and students are encouraged to interview with all companies seeking for their major.

PLANT VISITS—Students who do well in the on-campus interview are often invited for second interviews at the plant location. Arrangements will be confirmed prior to departure. This is usually the "make it, break it" interview.

REPORTING TO WORK—After accepting a co-op assignment, students must complete the Report to Work Form (available in OCS).

FEES—An administrative fee of $30 will be assessed by the University, which is due and payable during the semester of work. In addition, students desiring academic credit for assignments must register through their academic department and pay the required tuition.

How to Apply for Academic Credit

Students who have completed cooperative education work experiences and wish to get academic credit should follow these steps:

1. Register with the Office of Career Services, (Room 101 Murphy Hall) prior to reporting to your assignment. The OCS is your official link to the University while you are on work assignment. Therefore, you must register with the OCS.

2. Discuss your plans to co-op and get academic credit with your department chairperson and/or school dean. If your school/department requires that you enroll in a course and pay tuition while on work assignment, be sure to complete the registration process.

3. Provide the following documents to the OCS (Assistant Director of Experiential Learning) prior to the week of final exams:

    - An official copy of your position/job description
    - Unofficial copy of transcript
    - A copy of your student evaluation form (will be mailed while on co-op)
    - A copy of the employer evaluation form (will be mailed while on co-op)
    - A typewritten narrative - at least five hundred (500) words.

4. Following receipt and review of these documents, the Assistant Director of Experiential Learning will forward a formal recommendation package to the department chairperson and/or designated person.

5. Follow-up with the department chairperson to determine the status of the recommendation from the OCS.

The (typewritten) narrative should be technical and cover the following:

- Identify initial work assignment dates and instructions given.
- Type of work/projects performed

- Equipment/tools/materials used in completing work
- Relatedness to course(s) in current curriculum
- Level of success in project(s)
- What was learned
- How results will be used at company/agency
- Type of company/agency
- Level of interaction with co-workers
- Level of responsibility (show ability to work independently)
- Awards/Recognition received

Department of Electronics, Computer, and Information Technology
Distance Learning Degree Program

Welcome to the Electronics Technology Distance Learning Program

The BS in Electronics Technology degree program enables individuals employed in business, industry and state related occupations to pursue a four-year degree through part-time on-line study. Instructional delivery will be completely on-line. The intent of the degree program is to provide an appropriate educational experience to qualify graduates for career advancement.

General Information

1. Applicants for the BS in Electronics Technology on-line degree programs (major code: 0184, 0289, and 0290) should have a two-year college degree, preferably in a technical discipline.

2. All students must have access to a modern computer preferable using roadrunner or DSL for connectivity to the Internet. Assignments may include accessing Internet resources, and the home page of the instructor. Email and FAX may also be modes of communication.

3. The BS in Electronics Technology on-line degree program is typically completed in three to four years of part-time study beyond the two year degree.

4. There are two primary points of contact at NCA&TSU:
   - Dr. Derrek Dunn, Chairperson, oversees the academic requirements of the degree program and provides advising services. He can be reached at (336) 334-7718 ext. 2286 or dbdunn@ncat.edu .
   - Ms. Pat White, Student Support Services Coordinator of the Center for Distance Learning. She has responsibility for administrative services, such as registration fees, etc. Her contact is (336) 256-0355 or whitep@ncat.edu.

5. You may also access information regarding on-line resources for the distance learner at http://fac.ncat.edu/dist/default.htm. As with students who are campus-based, students at a distance are also expected to be knowledgeable about NCA&TSU academic regulations and policies.

Requirements for the Bachelor of Science in Electronics Technology (Major code: 0184) degree program for Distance Learning students

1. Complete the General Education component at a community college. This component is contained in the AA and AS college transfer degree programs. Once completed and transferred to NCA&TSU, it should waive the Liberal Studies component of the Electronics Technology degree program at NCA&TSU.

2. The Bachelor of Science in Electronics Technology (major code: 0184, 0289, and 0290) degrees require a maximum of 128 semester hours. In most cases, between the required NCA&TSU courses, the General Education component and the courses in a two year college degree, this requirement is met. However, there may be instances where a student may have to take elective credits beyond required course work to reach the 128 hours.

3. Students may be required to take additional on-line courses at other universities and transfer the credits to NCA&T to complete the Bachelor of Science in Electronics Technology degree requirements.

ECIT FACULTY AND STAFF

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Assistant Professor
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Associate Professor and Chairperson
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Department ECIT Student Advisor List 2006/2007 AY

Advisor	BSET (general) Undergraduate and Transfer Students	Information Technology Undergraduate and Transfer Students	Graduate Students	NCA&TSU University Honor Program Students[1]
Mr. Ronnie Rollins		A-Z	A-Z (MSIT-IT)	
Mr. Michael Jones	A-B			
Dr. DeWayne Brown	C-D		A-Z (MSIT-ECT)	
Mr. Daniel Kohn	E-G			
Dr. Felix Edgal	H-J			
Dr. David Eromon	K-L			
Dr. Fereshteh Fatehi	M-N			
Dr. Walter Gilmore	N-R			
Dr. Claude Hargrove	S-W			
Ms. Angela Lemons		A-Z		A-Z
Mr. Thomas Avery	W-Z			

References:

[1] RIT Web Site (http://www.it.rit.edu/whichpathBS.php)
[2] U.S. Department of Labor Web Site (http://www.bls.gov/oco/ocos268.htm)
[3] U.S. Department of Labor Web Site (http://bls.gov/oco/ocos112.htm)