

COLLEGE OF INFORMATION SCIENCE AND TECHNOLOGY

Joseph D. Chase, Acting Dean
Davis 127, (540) 831-5958
www.it.radford.edu

Susan Underwood, Advising Coordinator
Stuart Hall 163, (540) 831-5601

MISSION

The College of Information Science and Technology prepares students with skills and expertise essential to the Commonwealth and the nation as it moves from an industrial to an information based economy. The college emphasizes the theory and applications of technology. The college develops students' creative and critical thinking skills and teaches students to analyze problems and implement technological solutions to a vast array of challenges in the arts, sciences and every aspect of business. Students will be prepared to bring creative and socially responsible innovations to the workplace.

UNDERGRADUATE DEGREES

Students in the college earn a Bachelor of Science degree in Computer Science and Technology or a Bachelor of Science degree in Information Science and Systems. Within the B.S. in Computer Science and Technology, concentrations are available in computer science, database, software engineering, and networks. Within the B.S. in Information Science and Systems, concentrations are available in information systems, enterprise systems development. Minors include computer science and information technology.

Students can also enroll in an interdisciplinary concentration outside the college, just as technology concentrations are available for majors of RU's other five colleges (Arts and Sciences, Business and Economics, Education and Human Development, Waldron College of Health and Human Services and Visual and Performing Arts). For example, a student majoring in journalism could elect to take a concentration of the college's courses on Internet development and a major in the college could elect to take a concentration of courses in technical writing or media studies. That flexibility is unique to the College of Information Science and Technology and enables a wealth of opportunity and options for students across campus. Agreements with local community colleges provide four-year degree opportunities for community college students

receiving associate degrees in technology and business management. For example, students who have earned an Associates of Applied Science (AAS) in business administration may continue in RU's enterprise systems development concentration.

GRADUATION REQUIREMENTS

Students must have a grade point average (GPA) of at least 2.0 in all courses taken at Radford to graduate with the Bachelor of Science degree. In addition, students must have at least a 2.0 GPA in all major courses taken at Radford. For the purpose of computing the major GPA, include all courses required by the major and all courses required by the concentration except for science courses, course taken to fulfill the six hour B.S. requirement, and courses taken to fulfill the communications requirement. Additional requirements for each concentration may be specified in their respective sections of this catalog.

GENERAL EDUCATION

The General Education program introduces students to the varied modes of inquiry in the arts, humanities, social sciences and natural sciences. The College offers a broad introduction to ethics, social consequences, organizational impacts, public policy, and personal responses to information technologies to build a context for responsible and adaptable users. Additional courses are designed to introduce a variety of topics (e.g., web development, information management) to allow greater access for non-majors.

TECHNOLOGY IN LEARNING CENTER

The Technology in Learning Center is the focal point for training at the university. The Center implements policies and procedures for training, and promotes the expanded use of technology among faculty, staff, and students. The center raises the level of technological knowledge and skills, enhances the effective integration of technology into the teaching and learning environment and facilitates the utilization of resources by coordinating the services available through existing training units in the university.

❖INFORMATION TECHNOLOGY

Robert Phillips, Acting Chairperson
Davis Hall B51, (540) 831-5381
www.it.radford.edu

UNDERGRADUATE PROGRAM

The Computer Science and Technology and Information Science and Systems programs prepare students for a variety of rewarding careers in industry and government and for graduate study. The Computer Science Concentration of the Computer Science and Technology Program is accredited by the Accreditation Board for Engineering and Technology, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012. Such accreditation is based on an evaluation of the department's faculty, curriculum, computing resources, students and institutional support. There are seven laboratories available for students within the college with hardware ranging from Sun workstations to PCs to Macintosh computers, and software platforms ranging from Linux to Windows NT/2000 to MacOS. Each of the department's laboratories is connected to the campus network and to the Internet and can be accessed through the university modem pool. Students in the college are not required to purchase their own computers; instead, all courses can be completed using equipment in the department's laboratories. The college requires its students to use multiple platforms (Windows NT/2000 and Solaris) and to learn multiple languages (including Java). Many students go on to take coursework in other languages (e.g. C++, Perl, Ada) and specialized platforms appropriate to their concentration. In this way, graduates of the program have a diverse background and are better able to handle the rapid pace of change in industry.

CORE REQUIREMENTS

All students in the college are required to complete the following core requirements:

College Core Information Technology	15
ITEC 110. Principles of Information Technology.*	3
ITEC 120. Principles of Computer Science I.*	4
ITEC 220. Principles of Computer Science II.*	4
ITEC 225. Web Programming.*	3
ITEC 490. Senior Seminar.	1
* a grade of "C" or better is required in these courses for all college majors.	

BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND TECHNOLOGY

Students seeking the Bachelor of Science in Computer Science and Technology must complete the college core requirements listed earlier. Students must choose at least one of the four concentrations within the major: Computer Science, Database, Software Engineering, and Networks. The Computer Science concentration is designed to provide graduates with a breadth of background experience to pursue a wide variety of career opportunities or graduate study. The Database, Software Engineering, and Networks concentrations are designed to provide graduates a breadth of software development experience with a depth of knowledge in a particular application area.

DEGREE CORE	12
Information Technology	6
ITEC 224. Principles of Computer Science III.	3
ITEC 122. Discrete Mathematics.	3

Required General Education Courses	6
MATH 151. Calculus and Analytical Geometry.	3
COMM 114. Public Speaking.	3
or	
COMM 240. Teamwork and Communications.	

COMPUTER SCIENCE CONCENTRATION

In addition to the college core requirements and the degree core requirements and the B.S. requirements, students in the Computer Science Concentration are required to complete the following:

Information Technology	24
ITEC 320. Procedural Analysis and Design.	3
ITEC 352. Computer Organization.	3
ITEC 360. Data Structures and Analysis of Algorithms.	3
ITEC 371. Operating Systems.	3
ITEC 380. Organization of Programming Languages.	3
ITEC 420. Computability Theory and Formal Languages.	3

Two courses selected from the following:

ITEC 340. Database I.	3
ITEC 350. Introduction to Computer Networking.	3

ITEC 370. Software Engineering I.	3	requirements, students in the Database concentration are required to complete the following:	
ITEC 410. Modeling and Simulation.	3		
ITEC 430. Computer Graphics.	3		
ITEC 460. Translator Design and Construction.	3		
ITEC 480. Artificial Intelligence.	3		
Physics	8	Information Technology	27
PHYS 221. Physics.	4	ITEC 320. Procedural Analysis and Design.	3
PHYS 222. Physics.	4	ITEC 325. Web Programming II.	3
		ITEC 340. Database I.	3
		ITEC 441. Database II.	3
		ITEC 442. Database III.	3
		Plus 12 additional credit hours chosen from any 300 or 400 level ITEC courses (except ITEC 301, 400, 493, or 498)	12
Mathematics	9	B.S. Requirements	6-8 additional hours
MATH 152. Calculus and Analytical Geometry II.	3	Chosen from the following:	
(MATH 155 may be substituted for MATH 151 and 152)		Any 300 level or above ITEC course (except ITEC 301 and ITEC 400); MATH 152 or MATH 155; any 200 level or above Math course; ASTR 111, ASTR 112, any Biology (except BIOL 301 and 302); any Chemistry; any Geology (except GEOL 110 and 205), any Physics, or PHSC 301.	
MATH 251. Calculus and Analytical Geometry III.	3		
STAT 410. Probability and Statistics I.	3	General Education Requirements	41
		(see p. 60)	
		Note: Nine of the 50 hours of General Education are satisfied by major requirements	
B.S. Requirements	7-8 additional hours	Elective hours	17-19
Chosen from the following list:			
ASTR 111:112; any Biology (except BIOL 301:302); any Chemistry; any Geology (except GEOL 110, 205); any Physics (except PHYS 111:112 and PHYS 221:222 or PHYS 231); PHSC 301.		Total Credits Needed for Degree	120
General Education Requirements	33		
(see p. 60)			
Note: 17 of the 50 hours of General Education are satisfied by major requirements.			
Elective Hours	11-12		
Total Credits Needed for Degree	120		

GRADUATION REQUIREMENTS FOR THE COMPUTER SCIENCE CONCENTRATION

Each student majoring in the Computer Science Concentration of the Computer Science and Technology degree must take the Graduate Record Achievement Test in Computer Science or an equivalent exam as determined by the department during her or his last semester. Each student majoring in the Computer Science Concentration of the Computer Science and Technology degree must earn a grade of "C" or better in each information technology course required for the major.

DATABASE CONCENTRATION

In addition to the college core requirements and the degree core requirements and the B.S.

SOFTWARE ENGINEERING CONCENTRATION

In addition to the college core requirements and the degree core requirements and the B.S. requirements, students in the Software Engineering Concentration are required to complete the following:

Information Technology	27
ITEC 320. Procedural Analysis and Design.	3
ITEC 370. Software Engineering I.	3
ITEC 380. Organization of Programming Languages.	3
ITEC 471. Software Engineering II.	3
ITEC 472. Software Engineering III.	3
Plus 12 additional credit hours chosen from any 300 or 400 level ITEC courses (except ITEC 301, 400, 493, or 498).	12
B.S. Requirements	6-8 additional hours
Chosen from the following:	
Any ITEC 300 level or above ITEC course (except ITEC 301 and ITEC 400); MATH 152 or MATH 155; any 200 level or above Math course;	

ASTR 111:112, any Biology (except BIOL 301:302); any Chemistry; any Geology (except GEOL 110 and 205), any Physics; PHSC 301.

General Education Requirements 41
(see p. 60)

Note: Nine of the 50 hours of General Education are satisfied by major requirements

Elective Hours 17-19

Total Credits Needed for Degree 120

NETWORKS CONCENTRATION

In addition to the college core requirements and the degree core requirements and the B.S. requirements, students in the Networks Concentration are required to complete the following:

Information Technology	27
ITEC 310. Programming in C and Unix.	3
ITEC 340. Database I.	3
ITEC 350. Introduction to Computer Networking.	3
ITEC 352. Computer Organization.	3
ITEC 371. Operating Systems I.	3
ITEC 451. Network Design and Analysis.	3
ITEC 452. Distributed Computing.	3

Plus 6 additional credit hours chosen from any 300 or 400 level ITEC courses (except for ITEC 301, 400, 493, or 498). 6

Mathematics	6
MATH 152. Calculus and Analytical Geometry II.	3
(MATH 155 may be substituted for MATH 151 and 152)	
STAT 410. Probability and Statistics I.	3

B.S. Requirements 6-8 additional hours
Chosen from the following:

Any 300 level or above ITEC course (except ITEC 301 and ITEC 400); any 200 level or above Math course; ASTR 111, ASTR 112, any Biology (except BIOL 301 and 302); any Chemistry; any Geology (except GEOL 110 and 205), any Physics, or PHSC 301.

General Education Requirements 41
(see p. 60)

Note: Nine of the 50 hours of General Education are satisfied by major requirements

Elective hours 11-13

Total Credits Needed for Degree 120

TEACHER LICENSURE

**COMPUTER SCIENCE TEACHING
CERTIFICATION ADD-ON
ENDORSEMENT**

A student may pursue an add-on endorsement in computer science while pursuing another endorsement for licensure in a different area or after receiving initial licensure. The add-on endorsement may not be used for initial licensure. The applicant seeking an add-on endorsement in computer science shall complete a minimum of 15 semester hours of course work according to the guidelines below. Courses may be counted toward multiple categories where appropriate. Each course applied to the endorsement must be passed with a grade of "C" or better. Computer Science: Minimum of 6 hours. Both ITEC 120 and ITEC 220. Data Structures and/or Algorithms Analysis: Minimum of 3 hours. Either ITEC 220 or ITEC 360. Introduction to Computer Systems: Minimum of 3 hours. Either ITEC 100 or ITEC 352. Application of Computer Technology: Minimum of 3 hours. Choose from the following: ITEC 100, ITEC 201, ITEC 122, ITEC 198, ITEC 224, ITEC 225, ITEC 340, ITEC 350, ITEC 370, DSNI 320, DSNI 420, GEOG 314, GEOG 360, GEOG 420, GEOL 405, MSTD 328, MSTD 426, MUSC 127, MUSC 128, MUSC 227, MUSC 428, MATH 330, STAT 430.

**BACHELOR OF SCIENCE IN
INFORMATION SCIENCE AND
SYSTEMS**

Students seeking the Bachelor of Science in Information Science and Systems must complete the college core requirements listed above. Students must choose from at least one of three concentrations within the major: Information Systems, Web Development and Enterprise Systems Development. The Information Systems concentration is designed to provide graduates with a background in both information technology and business so that graduates can pursue a variety of career opportunities applying, managing, and supporting information technology within profit and non-profit organizations. The Web Development concentration prepares students in all aspects of web site design, development, integration, security, and maintenance. The Enterprise Systems Development concentration is specifically designed to produce students with a high level of expertise in business systems analysis, design, and development.

In addition to the 15 hours of Information Technology required in the College of Information Science and Technology core, the following courses are required for the Bachelor of Science in Information Science and Systems:

DEGREE CORE 15

Information Technology 6
ITEC 340. Database I. 3
ITEC 370. Software Engineering I. 3

Business 6
ACTG 211. Fundamentals of Financial Accounting. 3
MKTG 340. Essentials of Marketing. 3

Required General Education Courses 3
ECON 106. Principles of Economics II. 3

B.S. Requirement 6-7 additional hours

Three hours chosen from the following:
ITEC 224 or any ITEC 300 level or above ITEC course (except ITEC 301 and ITEC 400). The remaining hours chosen from the following: ITEC 224, any 300 level or above ITEC course (except ITEC 301 and ITEC 400), MATH 152, MATH 155, any 200 level or above Math course, ASTR 111, ASTR 112, any Biology (except BIOL 301 and 302), any Chemistry; any Geology (except GEOL 110 and 205), any Physics, or PHSC 301.

INFORMATION SYSTEMS CONCENTRATION

In addition to the college core requirements and the degree core requirements and B.S. requirements, students in the Information Systems Concentration are required to complete the following:

Information Technology 9
ITEC 100. Introduction to Information Technology. 3
ITEC 485. Decision Support Systems. 3
ITEC 495. Information Systems Capstone. 3

Business 18
BLAW 203. Legal Environment of Business. 3
MGNT 322. Organizational Behavior. 3
MGNT 333. Statistical Decision Support. 3
ACTG 212. Fundamentals of Managerial Accounting. 3
FINC 331. Introduction to Business Finance. 3
MGNT 357. Operations Management. 3

Required General Education Courses 12

MATH 121. Business Calculus.
or
MATH 151. Calculus and Analytical Geometry. 3
STAT 200. Introduction to Statistics.
or
STAT 410. Probability and Statistics I. 3
ECON 105. Principles of Economics I. 3
COMM 114. Public Speaking.
or
COMM 240. Teamwork and Communications. 3

General Education Requirements 38 (see p. 60)

Note: 12 of the 50 hours of General Education are satisfied by major requirements

Elective Hours 6-7

Total Credits Needed for Degree 120

ENTERPRISE SYSTEMS DEVELOPMENT CONCENTRATION

In addition to the college core requirements, the degree core requirements and the B.S. requirements, students in the Enterprise Systems Development Concentration are required to complete the following:

Information Technology 18
ITEC 100. Introduction to Information Technology. 3
ITEC 122. Discrete Mathematics. 3
ITEC 224. Principles of Computer Science III. 3
ITEC 320. Procedural Analysis and Design. 3
ITEC 350. Introduction to Computer Networking. 3
ITEC 495. Information Systems Capstone. 3

Business 15
ACTG 212. Fundamentals of Managerial Accounting. 3
ACTG 410. Accounting Information Systems. 3
FINC 331. Introduction to Business Finance. 3
MGNT 333. Statistical Decision Support. 3
MGNT 357. Operations Management. 3

Required General Education Courses 6

MATH 121. Business Calculus.
or
MATH 151. Calculus and Analytical Geometry I. 3
STAT 200. Introduction to Statistics. 3

Plus any two courses selected from the following:

COMM 114. Public Speaking.*	6
COMM 240. Teamwork and Communication.*	3
COMM 314. Organizational Communication.	3
COMM 439. Leadership and Group Communication.	3
ENGL 306. Professional Writing.	3
ENGL 307. Business Writing.	3
ENGL 406. Advanced Technical Writing.	3

*Satisfies part of the General Education requirement.

General Education Requirements 35-38
(see p. 60)

Note: 12-15 of the 50 hours of General Education are satisfied by major requirements

Elective Hours 3-4

Total Credits Needed for Degree 120

**WEB DEVELOPMENT
CONCENTRATION**

In addition to the college core requirements, the degree core requirements and the B.S. requirements, students in the Web Development Concentration are required to complete the following:

Information Technology	9
ITEC 325. Web Programming II.	3
ITEC 350. Introduction to Computer Networking.	3
ITEC 425. Advanced Web Development.	3

Business	3
MKTG 342. Internet Marketing.	3

Media Studies and Art	15
MSTD 226. Digital Imaging.	3
MSTD 326. Web Production.	3
MSTD 400. Media Law and Ethics.	3
MSTD 427. Advanced Web and Multimedia Production.	3
ART 280. Introduction to Graphic Design.	3

Required General Education Courses	9
MATH 121. Business Calculus.	
or	
MATH 151. Calculus and Analytical Geometry.	3
STAT 200. Introduction to Statistics.	
or	
STAT 410. Probability and Statistics I.	3

COMM 114. Public Speaking	
or	
COMM 240. Teamwork and Communications.	3

General Education Requirements 38
(see p. 60)

Note: 12 of the 50 hours of General Education are satisfied by major requirements.

Elective Hours 10

Total Credits Needed for Degree 120

MINORS

The following College of Information Science and Technology minors are available to students not already pursuing a Bachelor of Science in Computer Science and Technology or a Bachelor of Science in Information Science and Systems. Fifty percent of the hours required for the minor must be completed at Radford University. A student must have a 2.0 or higher GPA in the minor.

COMPUTER SCIENCE MINOR 17

Requirements for a computer science minor are ITEC 110, ITEC 120, ITEC 220, ITEC 225, and at least three additional hours chosen from ITEC 122 or any 200 level or above ITEC course except for ITEC 202 and ITEC 400. Each course applied to the minor must be passed with a grade of "C" or better. The minor GPA will be calculated by using the 17 best hours applied toward the minor.

**INFORMATION TECHNOLOGY
MINOR 18**

The information Technology minor consists of 18 credit hours of ITEC courses. Courses cross-listed as ITEC courses may be used to count toward the minor. The minor GPA will be calculated by using the 18 best hours applied toward the minor.