COMPUTER SYSTEMS ANALYSIS

**Program Description**

The Computer Systems Analysis bachelor’s completion program is a two-year evening program designed for students who have an existing two-year degree or certificate in networking, programming, or databases. The program prepares students to analyze procedures, methods, and uses of computer systems. Graduates develop the critical thinking, troubleshooting, and analytical skills to help companies build and maintain computer systems, design and implement network systems, design software, or make changes to hardware to improve routine habits. They also learn how to study an organization’s current computer systems and procedures and make recommendations to management to help the organization operate more efficiently and effectively.

Coursework includes such topics as IT security, management information systems, and computer architecture. Students also have a choice of electives in networking, software, or data architecture. Arts & Sciences courses enhance and support the technical coursework.

**Dunwoody College of Technology:** a non-profit, private technical college since 1914.

**Degree Requirements**

Transfer credits from AAS or AS degree; requires a transfer evaluation

- BCSA3100 Computer Architecture
- BCSA3110 Discrete Mathematics
- IENG4145 Engineering Economic Analysis
- BCSA3200 Operating Systems
- BCSA3210 Algorithms/Data Structures
- IENG4210 Simulation Modeling & Analysis
- MGMT4230 Management Information Systems I
- BCSA4100 Security
- BCSA4110 Formal Languages & Automata
- BCSA4200 Capstone
- IENG4135 Operations Management
- BCSA3120* Systems Analysis Practicum
- BCSA4120** Database Technologies
- BCSA4210*** Software Engineering
- BCSA4230**** Network Architecture
- MATH1700 Precalculus
- MATH1810 Calculus I
- MATH1820 Calculus II
- PSYC3000 Organizational Behavior
- PHYS1820 Calculus-Based Physics
- WRIT4020 Capstone Technical Writing

* Or take BCSA3130 Management of Distributed Systems
** Or take BCSA4130 Management Information Systems II
*** Or take BCSA4220 Quality Assurance & Testing
**** Or take BCSA4240 Data Architecture

**Common Job Titles**

- Computer Systems Analyst
- Information Systems Manager
- Network Systems Analyst

**Recent Employers**

- UnitedHealth Group/Optum
- Accenture
ditech

**Salary Data**

- Annual Average Salary: $89,190

**Placement Rate**

- 100%

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**How to Apply**

- dunwoody.edu
- 612.374.5800
- info@dunwoody.edu
Course Descriptions

BCSA3100 Computer Architecture, 3 cr.
Introduction to computer architecture, processors, instruction sets, and assembly language programming.

BCSA3110 Discrete Mathematics, 3 cr.
Examine the logic-related mathematical background necessary for upcoming courses. Topics include: logic, sets, functions (as defined in the Mathematics domain), sequences, algorithmic complexity, number theory, matrices, proof of complexity, mathematical induction, recursion, counting, probability, and graph and tree fundamentals.

IENG4145 Engineering Economic Analysis, 2 cr.
The concepts of finance and economics within the engineering environment. Analyze costs, risk, funding options, economic return on investment, and legal and environmental concerns.

BCSA3200 Operating Systems, 3 cr.
Analyze the purpose of operating systems. Topics include: elements of operating systems, memory and process management, interactions among major components of computer systems, and an examination of the effects of computer architecture on operating systems.

BCSA3210 Algorithms/Data Structures, 3 cr.
Investigate the creation of algorithms, the study of the running time or complexity of the proposed solution, and interesting related problems with algorithms, including some which cannot be solved by machines. Review well-known algorithms, including those in the areas of searching, sorting, scheduling, tree and graph traversal to understand algorithms and the data structures used to solve them efficiently, like linked lists, stacks, queues, and recursion structures.

IENG4210 Simulation Modeling & Analysis, 3 cr.
Utilize simulation to create, analyze, and evaluate realistic models of real-world environments. Topics include Monte Carlo simulation, queuing theory, selecting input distributions, animation in simulation, and evaluating simulation output.

MGMT4230 Management Information Systems I, 2 cr.
The ways in which management and information services influence business strategies, communications technology, information systems analysis and design, issues arising out of the rapidly evolving field of information systems, and a general overview of IT compliance.

BCSA4100 Security, 3 cr.
Explore fundamental and emerging concepts of computer security. Topics include: maintaining information confidentiality, protecting information integrity, assuring information availability, physical, technical, application, and Internet security, social engineering and associated attacks.

BCSA4110 Formal Languages & Automata, 3 cr.
Determine how proper programming languages and systems are created. Examine formal logic and models of computation including finite state automata, pushdown automata, and Turing machines. Investigate problems for which a formal solution is not possible, problems which cannot be solved by finite, or real, machines, and problems for which complete solutions are not possible but 'good enough', or heuristic solutions.

BCSA4200 Capstone, 3 cr.
An industry (field)-specific capstone project of student's choice. Present a comprehensive project within a field of study that draws on the relevant components of previous course work.

IENG4135 Operations Management, 2 cr.
Explain the planning, organization, coordination, and control of the resources needed to produce a company's goods and services. Topics include strategy alignment, capacity planning, aggregate plans, and the importance of social responsibility.

BCSA3120 Systems Analysis Practicum, 3 cr.
Survey of the various approaches for software development from traditional systems analysis to contemporary agile methods, Unified Modeling Language (UML), and object-oriented design. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

BCSA3130 Management of Distributed Systems, 3 cr.
Integration of data and users with an emphasis on security will be used in client/server, Internet, intranet/extranet, and other technologies. Review state-of-the-art technologies in each of the basic software and hardware arenas, while emphasizing management models and higher-level analysis using the computer.

BCSA4120 Database Technologies, 3 cr.
Database technologies and the resources (hardware and software) that are needed to implement the various database systems needed to run an organization at the management level.

BCSA4130 Management Information Systems II, 3 cr.
Examine budgeting, how to write RFP's (Request for Proposal), contract management, capacity planning, operations and user support, orphan ware, writing and enforcing policies. Identify aspects of security in software programs, social engineering, and network security.

BCSA4210 Software Engineering, 2 cr.
Introduction to software engineering as an area of computer science. Focused study of requirements and requirements engineering; overview of various modeling techniques applicable to requirements and specification, including UML and formal modeling.

BCSA4220 Quality Assurance & Testing, 2 cr.
Theoretical and practical aspects of testing software. Analyze requirements documents through executing test cases and writing a test report. Investigate the types of testing that should be done, who should do it, when are we done, and why it should be done at all. Identify the life cycle issues related to development and maintenance, quality, safety, and security assurance project management, and automated support environments. Practice the skill set required to organize and carry out the software testing phase for any small or medium-size software project.

BCSA4230 Network Architecture, 2 cr.
Concepts and fundamental principles in modern network design and implementation that span LAN/WAN using TCP/IP and Ethernet. Review of topics related to layered models such as the OSI and TCP/IP logic models. Focus on the areas of network design and optimization. Specification of a network's physical and logical components and their function related to facilitating business processes, as well as network testing and documentation for the purpose of analyzing current architectures for improved performance.

BCSA4240 Data Architecture, 2 cr.
Practical applications surrounding the modeling and querying of database system. Concepts at a higher level than the typical database course, focusing on data models, data manipulation languages, extension of data types, data design and how that differs with database design.

MATH1700 Precalculus, 3 cr.
Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

MATH1810 Calculus I, 3 cr.
The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Computer software will enable the application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

MATH1820 Calculus II, 3 cr.
The fundamental tool used by engineers and scientists to determine critical measurements, such as calculating the area under curves or the capacities inside of complex geometries. Computer software will enable the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.
**Course Descriptions**

**PSYC3000 Organizational Behavior, 2 cr.**
Basic principles of human behavior that are used when managing individuals and groups in organizations. Includes theories relating to individual differences in abilities and attitudes, attribution, motivation, group dynamics, power and politics, leadership, conflict resolution, organizational culture, organizational structure and design as well as the process of ethical decision making for the employee, manager, and organization.

**PHYS1810 Calculus-Based Physics, 3 cr.**
Introduction to mechanics using differential and integral calculus as a foundation. Topics include kinematics and dynamics of linear motion, static equilibrium, the conservation of energy and momentum, mechanics of solids and fluids, and thermodynamics.

**WRIT4020 Capstone Technical Writing, 2 cr.**
Explain the details of a system with clear, concise, and professional writing. Present and document various items within a system both for technical and management perspectives. Develop through the stages of planning, researching, organizing, and revising your writing. The scope of the documentation is focused on the capstone project.