

Montgomery College Career and Curricula Guide

www.montgomerycollege.edu

301-279-5000

Produced by
Montgomery College
Offices of Admissions, Records, and Registration
and Institutional Advancement
2005

Introduction

Many students come to college without clearly defined career goals. The first step toward academic and career success is to select a field that matches a person's skills, interests, and values. This **Career and Curriculum Guide** provides sample career information and a corresponding curriculum for Montgomery College's credit degree and certificate programs. Counselors and academic advisers can use this information to assist students in selecting a career field, based on the overview provided for each training/education program.

This guide includes transfer programs for students who plan to continue their education and transfer in a specific discipline (e.g., business administration, computer science, or engineering), as well as technical and semiprofessional training programs for students who have a specific career interest and wish to complete two years of study for immediate entry into the workforce.

This guide was prepared using current data provided from the U.S. Department of Labor's Bureau of Labor Statistics *Occupational Outlook Handbook* and online resources, including www.monster.com and www.salary.com.

Montgomery College offers several computerized guidance programs that help students identify interests and match them with possible occupations. These programs are available in the Career/Transfer Center on any Montgomery College campus.

Montgomery College Career/Transfer Centers

Germantown Campus **301-353-7772**

www.montgomerycollege.edu/departments/studevgt/ctp.htm

Rockville Campus **301-279-5062**

www.montgomerycollege.edu/departments/studevrv/transfer-center.html

Takoma Park Campus **301-650-1479**

www.montgomerycollege.edu/departments/studevtp/career_main.htm

Montgomery College Campuses

Germantown Campus

20200 Observation Drive
Germantown, MD 20850
301-279-5000

Rockville Campus

51 Mannakee Street
Rockville, MD 20850
301-279-5000

Takoma Park Campus

7600 Takoma Park Avenue
Takoma Park, MD 20912
301-650-1300

The College's Career/Transfer Centers, counseling services, academic faculty, workshops on career exploration, and career development courses also provide services for any one interested in pursuing education and training at Montgomery College. Please consult the College's Web site and the *Montgomery College Catalog* (published annually) for more information and curricula updates.

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Under provisions of the Americans with Disabilities Act, this material is available in alternative formats by contacting the Disability Support Services Office at 301-279-5058 or TTY 301-294-9672 for the deaf and hard of hearing.

Montgomery College Curricula Summary

Montgomery College curricula are designed to serve a variety of individual educational needs, including preparation for transfer and for specific technical or semiprofessional careers. **Students wishing to transfer to four-year institutions are strongly encouraged to major in Liberal Arts and Sciences or General Studies**—and to plan their programs carefully.

The following list represents the entire Montgomery College curricula for 2005–06. Transfer programs are indicated by a **(tr)** suffix. Detailed transfer guidance and information on schools in the Maryland state system and other area colleges and universities can be found in the Career/Transfer Centers on all three campuses and on the Web at www.montgomerycollege.edu/transfer.

Some curricula are offered at all campuses and some are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, and TP for Takoma Park. If there is no campus designation, all campuses may offer the curriculum. (Note that the graphic design A.F.A. and studio art A.F.A. curricula on pages 22 and 23 are offered at the School of Art and Design in Silver Spring, as well as the Germantown, Rockville, and Takoma Park campuses.)

The number after the colon in each curriculum heading is the **program of study (POS) code**, corresponding to the code that appears in the admissions application and in the schedule of classes.

The Maryland Higher Education Commission approves the designation of some curricula at community colleges as **statewide programs**. Those programs are available to students in other areas where the local community college does not offer the same program. Registered students are then eligible for tuition differential between the in-county and out-of-county costs, providing the funds have been made available through the state budget process.

Accounting

Advertising Art

Advertising Design—see Communication
Arts Technologies

American Sign Language

Applied Geography

Cartography and Geographic Information Systems
Geographic Education

Architectural and Construction Technology

Architectural Technology
CAD for the Building Professional
Management of Construction

Arts and Sciences (tr)—see also Science

Art

Art Education
Art History
Graphic Design
Specialized Art
Studio Art
Health Enhancement, Exercise Science,
and Physical Education

Exercise Science/ Health Fitness
Leadership

Gerontology

Health Education

Personal Training

Physical Education Teacher Preparation/
Coaching

Interior Design—Preprofessional

Liberal Arts and Sciences

Arts

International Studies

Science or Mathematics

Music

Pre-Dentistry

Pre-Medical Technology

Pre-Medicine

Pre-Optometry

Pre-Pharmacy

Theatre

Dance

Theatre Performance

Theatre Technical

(more)

Montgomery College Curricula Summary *(continued)*

Automotive Technology

- Automotive Air Conditioning Specialist
- Automotive Drive Train Specialist
- Automotive Driveability Specialist
- Automotive Electrical Systems Specialist
- Automotive Suspension, Brake, and Alignment Specialist

Biotechnology

Building Trades Technology

- Building Remodeling and Repair
- Carpentry
- Electricity
- HVAC/R
- Plumbing

Business (tr)

- International Business

Communication Arts Technologies

- Advertising Art
 - Computer Graphics: Art and Animation
 - Graphic Design with the Computer
 - Illustration
- Communication and Broadcasting Technology
 - Broadcast Journalism
 - Digital Multimedia Production
 - Radio
 - Radio Production
 - Television
 - Television Production
- Photography
 - Electronic Photography
 - Photographic Techniques
 - Photography Master
 - Portrait, Fashion, and Photojournalism
 - Studio and Location Photography

Computer Applications

- Administrative Support Technology
- Information Technology

Computer Publishing and Printing Management

- Electronic Imaging Prepress
- Printing Technology

Computer Science and Technologies (tr)

- Computer Programming
- Computer Science
- Information Systems
- Java Developer
- Object-Oriented Software Development
- Oracle Database Fundamentals
- Oracle Developer

Criminal Justice

Education

- Early Childhood Education
- Teacher Education Transfer Program (Elem)

Engineering Science (tr)

- Aerospace Engineering
- Biological Resources Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Fire Protection Engineering
- General Engineering
- Mechanical Engineering
- Nuclear Engineering

Fire Science Fire Service Management

- Emergency Medical Technician—Basic
- Fire and Arson Investigation

General Studies (tr)

Geography—see Applied Geography

Health Sciences

- Diagnostic Medical Sonography
- Health Information Technology
- Medical Coder/Abstractor/Biller
- Mental Health Associate
- Nursing
- Physical Therapist Assistant
- Radiologic (X-Ray) Technology
- Surgical Technology

Hospitality Management

- Food and Beverage Management
- Hospitality Supervision and Leadership
- Meeting, Conference, and Event Planners

(more)

Montgomery College Curricula Summary *(continued)*

Interior Design—see also Arts and Sciences

- Advanced Interior Design
- Design Industry Partnership
- Introductory Interior Design
- Kitchen and Bath Design

Landscape Technology

Legal Assistant—see Paralegal Studies

Management

- Supervisory Management

Microcomputer Network Technologies

- A+ Microcomputer Certification
Qualification
- Electronics and Wireless Technology
- Microcomputer Technician

Music (tr)—see Arts and Sciences

Network Engineering

- Network Administration
- Network Engineer

Nursing—see Health Sciences

Paralegal Studies

- Legal Analysis

Photography—see Communication Arts Technologies

Printing Management—see Computer Publishing and Printing Management

Radio—see Communication Arts Technologies

Science (tr)—see also Arts and Sciences

- Chemistry and Biochemistry
- Environmental Science and Policy
- Life Science
- Mathematics
- Physics

Technical Writing

Television—see Communication Arts Technologies

Theatre (tr)—see Arts and Sciences

Web Careers

- Internet Games and Simulation
- Web Content, Design, and Marketing
- Web Programming
- Web Technologies

Careers

Accountants are professionals who keep, audit, and inspect financial records for individuals or businesses. They also may be hired to prepare various financial and tax reports. Accountants are employed with public or private accounting firms or federal, state, or local governments. Accounting clerks maintain general ledgers, record business transactions, and prepare financial reports. Payroll clerks input data from time sheets, balance payroll runs, produce federal, state, and local tax payments, and answer employee questions. Procurement clerks create purchase orders for the acquisition of materials. They research, interview, and negotiate with suppliers to obtain prices and specifications.

Salary

Students with two-year accounting degrees qualify for entry-level positions in bookkeeping and accounting, and as auditing clerks, tellers, payroll clerks, and procurement clerks. In 2002, median annual salaries for bookkeeping, accounting, and auditing clerks were \$26,320. Starting salaries for candidates with four-year degrees in accounting averaged \$40,647 a year.

According to online career sites, a bookkeeper with an associate's degree and one to three years' experience may earn from \$28,000 to \$32,500 annually.

Job Outlook

Employment for accountants and auditors is expected to grow as the number of businesses increase and grow. Professional recognition through certification or licensure, proficiency in accounting and auditing software, and strong interpersonal and communication skills will continue to be strong qualifications for job candidates. Specializing in a particular area, such as information systems, government

regulations, or international business, provides additional benefits for job seekers in a competitive market.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) and a certificate program in accounting. (*See reverse for accounting curriculum.*)

■ Degree

The accounting curriculum is designed to prepare students for employment in accounting. The A.A.S. curriculum, developed in conjunction with accounting professionals, is suitable for working in business, nonprofit private organizations, and all levels of government. This degree is not intended for students wishing to earn a bachelor's degree in accounting and/or become a CPA.

Graduates may find employment in such areas as accounting, finance, treasury, auditing, tax, cost, and systems.

■ Certificate

An accounting certificate curriculum is offered for students who want to upgrade their professional skills, but who do not want to complete a two-year degree.

■ Skills Upgrade

Anyone who holds a bachelor's degree and wants to upgrade their skills may benefit from the accounting courses included in the curriculum, especially those that fulfill some of the course requirements to sit for the Certified Public Accountant (CPA) exam.

Contact @ MC

Germantown Campus301-353-7722
Rockville Campus301-279-5137
www.montgomerycollege.edu

Accounting Curricula

Degrees, Certificates, and Letters of Recognition

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Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

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Take the next step.

Complete an Application for Admission form (available online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Accounting A.A.S. (G, R): 301

First Semester

AC201	Principles of Accounting I	4
BA101	Introduction to Business	
or		
MG101	Principles of Management	3
	EC elective*	3
EN101	Techniques of Reading and Writing	3
	Mathematics foundation	3

Second Semester

AC202	Principles of Accounting II	4
	CA or CS elective	3
	English foundation	3
	Speech foundation	3
	Arts or humanities distribution	3

Third Semester

AC207	Intermediate Accounting I	4
	Health foundation	1 (3)
MG201	Business Law	3
	Electives†	6

Fourth Semester

AC208	Intermediate Accounting II	4
AC219	Business Finance	3
	Elective†	3
	Natural sciences lab distribution	4

Total credit hours 60 (62)

*Select EC 105, EC 201, or EC 202.

†Select any accounting course numbered 209 or higher (except AC 219), MG 202, or a statistics course (BA 210 or MA 116).

Accounting Certificate (G, R): 167

Required Courses

AC201	Principles of Accounting I	4
AC202	Principles of Accounting II	4
AC207	Intermediate Accounting I	4

Electives

Select four courses from accounting courses numbered 208 or higher and MG 201.

Total credit hours 24 (25)

Careers

Advertising designers use a variety of print, electronic, and film media to create designs that meet clients' commercial needs. Using computer software, they develop the overall layout and design of magazines, newspapers, journals, corporate reports, and other publications. An increasing number of graphic designers are developing material for Internet Web pages, computer interfaces, and multimedia projects.

Illustrators typically create pictures for books, magazines, and other publications; and commercial products, such as textiles, wrapping paper, stationery, greeting cards and calendars. Increasingly, designers work in digital format, preparing work directly on a computer.

Salary

Median annual earnings for advertising designers were \$36,680 in 2002. Median annual earnings of salaried illustrators were \$35,260 in 2002.

Job Outlook

Overall, the employment of designers is expected to grow about as fast as the average for all occupations through the year 2012. In addition to those that result from employment growth, many job openings will arise from the need to replace designers who leave the field.

The need for artists to illustrate and animate materials for magazines, journals, and other printed or electronic media will spur demand for illustrators and animators of all types.

Education & Training Options

Montgomery College offers two tracks leading to an associate of applied science degree (A.A.S.) in advertising art: advertising design and illustration. In addition, two certificate curricula are offered: (1) computer graphics: art and animation and (2) graphic design with the computer. (*See reverse for advertising art curricula.*)

■ Degree

The advertising design track prepares the student for employment in the field of graphic communication.

The illustration track prepares the student for employment as an illustrator. Subject interpretation, communication, and technical skills are stressed in the preparation of the student's portfolio.

■ Certificate

The computer graphics: art and animation certificate emphasizes the aesthetic knowledge and technical skills necessary to produce effective computer graphics and animation.

The graphic design with the computer certificate prepares the student for immediate employment in graphic design using the computer in today's electronic applied art and design studio.

■ Workforce Training

Appropriate courses may be used toward development of marketable skills, for vocational interests, or for possible transfer. Students interested in any of the A.A.S. or certificate curricula should consult an academic adviser in the Visual Communications Technologies Department.

Contact @ MC

Rockville Campus301-279-5256
www.montgomerycollege.edu

Advertising Art Curricula

Degrees, Certificates, and Letters of Recognition

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Advertising Design (R): 304 Advertising Art A.A.S.

First Semester

AA121	Advertising Art Fundamentals	3
AA127	Visual Communication Production I	3
AR101	Drawing I	3
AR103	Design I	3
EN101	Techniques of Reading and Writing	3

Second Semester

AA110	Computer Essentials for the Graphic Designer	4
	or	
AA111	Introduction to the Macintosh	1
AA124	Advertising Design I	3
AA134	Illustration I	3
AR102	Drawing II	3
	English foundation	3

Third Semester

AA212	Publication Design with QuarkXPress	4
AA216	Digital Imaging with Illustrator	4
AA223	Advertising Design II	3
AR107	Art History I	3
	Health foundation	1
	Mathematics foundation	3

Fourth Semester

AA224	Advertising Design III	3
AR108	Art History II	3
	Speech foundation	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

Total credit hours 62 (65)

(more)

Advertising Art Curricula

(continued)

Illustration (R): 305 Advertising Art A.A.S.

First Semester

AA121	Advertising Art Fundamentals	3
AR101	Introduction to Drawing	3
AR103	Two-Dimensional Design	3
EN101	Techniques of Reading and Writing	3
	Behavioral and social sciences distribution	3

Second Semester

AA134	Illustration I	3
AR115	Figure Drawing I	3
CG120	Computer Graphics: Art and Illustration I	4
	English foundation	3
	Health foundation	1

Third Semester

AA135	Illustration II	3
AR107	Art History I	3
AR201	Painting I	3
CG121	Computer Graphics: Art and Illustration II	4
	Mathematics foundation	3

Fourth Semester

AA234	Illustration III	3
AR108	Art History II	3
CG210	Computer Animation and Illustration	4
SP108	Introduction to Human Communication	3
	Natural sciences lab distribution	4

Total credit hours 62

Computer Graphics: Art and Animation Certificate (R): 175

AR101	Drawing I	3
AR103	Design I	3
CG120	Computer Graphics: Art and Illustration I	4
CG121	Computer Graphics: Art and Illustration II	4
CG210	Computer Animation and Illustration	4
CG222	Computer Graphics: 3-D Modeling	4
TR101	Digital Video/Audio	4
	Electives*	6-8

Total credit hours 32-34

*Select six to eight credit hours from the following list: AA 110, AA 121, AA 124, AA 134, AA 214, AA 216, AA 224, AA 225, AR 102, AR 105, AR 201, AR 205, AR 224, CA 161, CG 226, CT 183, HP 251, and PG 165.

AA 224 and CT 183 have prerequisites that may be waived at the department's discretion. It is suggested that those certificate candidates who wish to pursue a career in graphics for publication take AA 110 and AA 214 as electives.

(more)

Advertising Art Curricula

(continued)

Graphic Design with the Computer Certificate (R): 205

Required Courses for Print Media Track (13–16 credit hours)

AA110	Computer Essentials for the Graphic Designer	4
	or	
AA111	Introduction to the Macintosh	1
AA212	Publication Design with QuarkXPress	4
AA214	Digital Imaging with Photoshop	4
AA216	Digital Imaging with Illustrator	4

Required Courses for Web Design Track (13–16 credit hours)

AA110	Computer Essentials for the Graphic Designer	4
	or	
AA111	Introduction to the Macintosh	1
AA214	Digital Imaging with Photoshop	4
AA216	Digital Imaging with Illustrator	4
AA218	Graphic Design for the Web	4

Elective Courses* (6–8 credit hours)

AA121	Advertising Art Fundamentals	3
AA124	Advertising Design I	3
AA212	Publication Design with QuarkXPress	4
AA218	Graphic Design for the Web	4
AA220	Digital Image Production AA or AR elective	3
CG120	Computer Graphics: Art and Illustration I	4
CG121	Computer Graphics: Art and Illustration II	4
CG210	Computer Animation and Illustration	4
CG222	Computer Graphics: 3-D Modeling	4
TR101	Digital Video/Audio	4

Total credit hours (each track) 19–24

*Students with no graphic design background should select AA 121 and AA 124 to complete their electives. Students with graphic design background should select CG 120, CG 121, CG 210, or any 200-level computer-based advertising art course not already taken.

Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Careers

Aerospace engineering deals with the development, design, and testing of flight vehicles, spacecraft, and missiles. Subdivisions within this field include

- aerodynamics—the flow of air and the associated forces, pressures, etc; flight dynamics—trajectories, rotational dynamics, sensors and controls;
- propulsion systems—the design of engines and motors;
- structures—issue of weight, stress, strain, vibration, etc., that constrain the selection of materials; and
- design—the most interdisciplinary field, connected with overview of the design of a specific vehicle to meet its performance goals.

Aerospace engineering and operations technicians install, construct, maintain, and test systems used to test, launch, or track aircraft and space vehicles. They may calibrate test equipment and determine the cause of equipment malfunctions. Using computer and communications systems, aerospace engineering and operations technicians often record and interpret test data.

Salary

In 2002, the median annual salary for aerospace engineering and operations technicians with a bachelor's degree in the aircraft and parts industry was \$59,520.

Job Outlook

As technology becomes more sophisticated, employers continue to look for technicians who are skilled in new technology and require a minimum of additional job training.

Education & Training Options

Montgomery College offers an aerospace engineering track in its engineering science A.S. curriculum. (*See reverse for aerospace engineering curriculum.*)

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in aerospace engineering to:

- University of Maryland College Park—follow the curriculum as published in the *Montgomery College Catalog*.
- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

■ Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering and have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, who add their own special expertise on the world beyond academia.

■ Workforce Training

The College's Workforce Development & Continuing Education program offers related professional development courses. For information, call 301-279-5188 or visit www.montgomerycollege.edu/wdce.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Aerospace Engineering Curricula

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Aerospace Engineering: 408 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers†	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES 102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Behavioral and social sciences distribution	3
	Humanities distribution	3

Third Semester

ES240	Scientific and Engineering Computation	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Arts distribution	3

Fourth Semester

ES221	Dynamics	3
ES232	Thermodynamics	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Behavioral and social sciences distribution	3

Total credit hours 61

*ENAE 283 Fundamentals of Aeronautical Systems should be taken at University of Maryland College Park in order to achieve full junior standing upon transfer.

†Students may substitute CH 102.

Careers

Sign language/spoken English interpreters are highly skilled professionals who listen to another person's words, inflections, and intent, and simultaneously render them into the visual language of signs using the communication mode preferred by the deaf consumer. They also translate from the deaf consumer back into spoken English.

Employment of interpreters for the deaf is projected to grow faster than the average through 2012.

Salary

Salaries for ASL interpreters depend on many factors, including geographic area, education, amount of experience, and credentials. Some interpreters work freelance and earn anywhere from \$12 to \$40 per hour, but they may not be able to schedule a full 40-hour week. Some highly skilled and credentialed interpreters, usually in metropolitan cities, can earn up to \$40,000 to \$50,000 a year.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in American Sign Language. (See reverse for *American Sign Language curricula*.)

Both the National Association of the Deaf and the Registry of Interpreters for the Deaf offer certification for sign interpreters and have recently collaborated to develop a joint exam.

■ Degree

The American Sign Language (ASL) curriculum provides instruction in the language and culture of the Deaf in North America. Students develop

ASL translating and interpreting skills. Graduates will be eligible to take the Registry of Interpreters for the Deaf (RID) examination for interpreting licensure or to be evaluated for the American Sign Language Teachers Association (ASLTA) Certificate.

■ Certificate

An American Sign Language certificate curriculum is designed for individuals with a variety of goals, including:

- Students preparing to enter an interpreter training program;
- Current interpreters needing to improve ASL skills, or maintain Interpreter Certification, through the Registry of Interpreters for the Deaf (RID) Certification Maintenance Program;
- Students preparing to teach ASL or to enter the field of Deaf education or Deaf-related research and discipline;
- Students whose first language is ASL who desire to learn the structure and syntax of their own language in order to develop a knowledge base to teach ASL, as well as to learn other languages;
- Students preparing for, or currently working in, careers requiring communication with Deaf consumers, business associates, colleagues, employees, supervisors, and students; and
- Students desiring to improve their understanding of Deaf culture to better communicate with Deaf family, friends, neighbors, and community.

Contact @ MC

Rockville Campus TTY 301-279-7556
.Voice 301-279-5250
www.montgomerycollege.edu

American Sign Language Curricula

Degrees, Certificates, and Letters of Recognition

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American Sign Language A.A.S.: 351

First Semester

	English foundation	3
SL100	Conversational ASL I	4
SL101	Structural ASL I	3
SL105	Visual Gestural Communication Foundations I	2
SL106	Fingerspelling and Number Use in ASL I	1
	Speech foundation	3

Second Semester

	Health foundation	1
	Mathematics foundation	3
SL102	Structural ASL II	3
SL110	Conversational ASL II	3
SL115	Visual Gestural Communication Foundations II	2
SL116	Fingerspelling and Number Use in ASL II	1

Third Semester

SL200	Conversational ASL III	3
SL201	Structural ASL III	3
SL226	Semantics and Communication in ASL I	1
SL269	Independent Study in ASL Behavioral or social sciences distribution	1-4
	Natural sciences lab distribution	3
		4

Fourth Semester

SL202	Structural ASL IV	3
SL207	ASL Translation and Interpretation for Literature	3
SL210	Conversational ASL IV	3
SL236	Semantics and Communication in ASL II	1
SL285	Practicum in ASL	3-4
	Arts or humanities distribution	3

Total credit hours 60-64

American Sign Language Certificate: 220

SL100	Conversational ASL I	4
SL101	Structural ASL I	3
SL102	Structural ASL II	3
SL110	Conversational ASL II	3
SL200	Conversational ASL III	3
SL201	Structural ASL III	3
SL202	Structural ASL IV	3
SL210	Conversational ASL IV	3
	SL electives	6

Total credit hours 31

Careers

Geographers study places, including their physical and cultural characteristics; their relationships to other places; and how they change through time. Most entry-level professionals seek positions as cartographic technicians, but other opportunities in the field do exist.

Increasingly, geographers create computerized maps using geographic information systems (GIS) technology to track information such as population growth, traffic patterns, environmental hazards, natural resources, and weather patterns.

Many geographers gain skills by pursuing and completing a bachelor's degree in geography and/or cartography.

Salary

Median annual earnings of geographers in 2002 were \$53,420. Entry-level salaries in the federal government with a bachelor's degree and no prior work experience ranged from \$23,442 to \$29,307 in 2003. Montgomery College graduates with proper credentials and work experience have obtained salaries in the \$40,000 to \$70,000 range within five years of completing the program.

Job Outlook

Employment opportunities for geographers are excellent in the Washington, D.C., area, a major research center and primary employment base for the United States. Geographers will have opportunities to advise government, real-estate developers, utilities, and telecommunications firms on where to build new roads, buildings, power plants, and cable lines. Opportunities exist in larger cities across the country in government, private, and teaching positions.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) and two certificate programs in applied geography. (See *reverse for applied geography curricula.*)

■ Degree

The applied geography A.A.S. curriculum is designed primarily for students who want to pursue a profession in geography, cartography, geographic education, or geographic information systems (GIS).

Course work includes lectures, research, fieldwork, use of computer technology, and mapping exercises.

■ Certificate

Two certificate options are offered: (1) cartography and geographic information systems and (2) geographic education.

■ Workforce Training

Advisers recommend Montgomery College graduates transfer to a four-year institution to complete a bachelor's degree before entering the job market.

■ Skills Upgrade

Review the applied geography courses in the current *Montgomery College Catalog* under "Course Descriptions."

Contact @ MC

Rockville Campus301-251-7614
www.montgomerycollege.edu or
tanya.allison@montgomerycollege.edu

Applied Geography Curricula

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

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Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmin.htm) or call 301-279-5000 for information.

Applied Geography A.A.S. (R): 344

First Semester

EN101	Techniques of Reading and Writing	3
GE101	Introduction to Geography	3
GE151	Introduction to Cartography	3
	Mathematics foundation	3 (4)
	Natural sciences lab distribution	4

Second Semester

	English foundation	3
GE102	Cultural Geography	3
GE104	Physical Geography	4
GE152	Interpretation of Geographic Imagery: Use and Analysis	3
HE100	Principles of Healthier Living	1

Third Semester

CA120	Introduction to Computer Applications	3
GE103	Economic Geography	3
GE110	Global Geography	3
	Cartography, GIS, or geography elective*	3
	Speech foundation	3

Fourth Semester

	CS or MA elective	3 (4)
GE203	Geographic Education or	
GE210	Preserving Our Natural Heritage	3
	Cartography, GIS, or geography elective*	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3

Total credit hours 60 (62)

*Select from GE 201, GE 202, GE 251, GE 252, GE 261, and GE 263.

(more)

Applied Geography Curricula

(continued)

Cartography and Geographic Information Systems Certificate (R): 184

GE101	Introduction to Geography	3
GE151	Introduction to Cartography	3
GE152	Interpretation of Geographic Imagery: Use and Analysis	3
GE251	Principles of Map Design	3
GE252	Introduction to Computer Mapping	3
GE261	Introduction to Geographic Information Systems	3
	Elective	3 (4)
Total credit hours		21 (22)

Geographic Education Certificate (R): 183

GE101	Introduction to Geography	3
GE102	Cultural Geography	3
GE104	Physical Geography	4
GE110	Global Geography	3
GE203	Geographic Education	3
GE210	Preserving Our National Heritage: The Geography of Conservation and Natural Resources	3
	Cartography or geography elective*	3
Total credit hours		22

*Select GE 103, GE 152, GE 201, or GE 202.

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Careers

Careers using construction and architectural technology may include draftsperson and architectural rendering (with manual and computer drafting skills), construction estimating and scheduling, construction specification writing, construction management, and inspection.

Drafters prepare technical drawings and plans used by production and construction workers to build structures. Drafters fill in technical details, using drawings, rough sketches, specifications, codes, and calculations made previously by engineers and architects. Drafters use technical handbooks, tables, calculators, and computers to complete their work.

Construction managers plan and coordinate construction projects. Although they usually play no direct role in the actual construction of a structure, they typically schedule and coordinate all design and construction processes, including selecting, hiring, and overseeing specialty trade contractors.

Cost estimators develop the cost information that business owners need to make a bid for a contract or to determine if a proposed new product will be profitable. They use computers for complex mathematical calculations and produce documentation.

Salary

In 2002, median annual earnings of architectural and civil drafters were \$37,330; of construction managers were \$63,500; and of cost estimators were \$47,550.

Job Outlook

Individuals who enter construction careers with a college degree usually start as management trainees or construction managers' assistants. Generally, jobs in the construction industry are expected to grow slowly through 2012.

Education & Training Options

In the construction industry, executive, administrative, and managerial personnel usually have a college degree or considerable experience. Montgomery College offers an associate of applied science degree (A.A.S.) in architecture and construction technology and two certificate programs. (*See reverse for architectural and construction technology curricula.*)

■ Degree

Two A.A.S. options are offered: (1) architectural technology and (2) management of construction. Both prepare graduates for entry into paraprofessional positions in the construction industry and architecture. Graduates may continue their education toward professional degrees or seek employment immediately.

■ Certificate

Two certificates are offered: (1) CAD for the building professional and (2) management of construction. The CAD certificate prepares students for entry-level positions in architectural or construction firms, providing training in computer-aided drafting (CAD) skills and building technology concepts. Management of Construction courses prepare students to organize, operate, manage, and control systems, procedures, and services in the construction industry, both on the job site and in the contractor's office.

Contact @ MC

Rockville Campus
Architectural Technology301-251-7599
Construction Management301-279-7616
www.montgomerycollege.edu

Architectural and Construction Technology Curricula

Degrees, Certificates, and Letters of Recognition

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Architectural Technology (R): 302 Architectural and Construction Technology A.A.S.

First Semester

CT130	Construction Methods and Materials	3
CT170	Introduction to Architecture and the Built Environment	3
CT181	Architectural Drafting Techniques	3
	English foundation	3
	Mathematics foundation	3

Second Semester

CT142	Introduction to Architectural Graphics	3
CT183	Computer Drafting: Architectural Applications	4
CT212	Construction Management	
	or	
	Professional elective*	3
	Speech foundation	3
	Behavioral and social sciences distribution	3

Third Semester

AR209	History of Architecture I	
	or	
	Arts or humanities distribution	3
CT201	Introduction to Architectural Design	4
CT223	Computer Drafting: Architectural 3D Presentation	4
CT284	Construction Estimating	
	or	
	Professional elective*	3
	Health foundation	1

Fourth Semester

AR210	History of Architecture II	
	or	
	Professional elective*	3
CT224	Computer Drafting: Advanced Architectural Applications	4
CT291	Building Codes and Inspection	
	or	
	Professional elective*	3
CT299	Professional Practicum	1
PH203	General Physics I	
	or	
	Natural sciences lab distribution	4

Total credit hours 61*

*Professional electives: AC 201, BU electives, CT 170, CT 181, CT 183, CT 200 (1 credit unit), CT 291, Professional electives: AR 101, AR 103, AR 209, AR 210, CA 120, CT 200 (3 sessions), CT 283, CT 288.

(more)

Architectural and Construction Technology Curricula

(continued)

Management of Construction (R): 303 Architectural and Construction Technology A.A.S.

First Semester

CT130	Construction Methods and Materials	3
CT131	Construction Plan Reading	3
CT135	Construction Field Operations	3
EN101	Techniques of Reading and Writing	3
	Mathematics foundation	3

Second Semester

CT190	Computer Applications in Construction	3
CT212	Construction Management	3
	English foundation	3
	Speech foundation	3
	Arts or humanities distribution	3

Third Semester

CT271	Construction Surveying	3
CT283	Mechanical and Electrical Systems	3
CT284	Construction Estimating	3
	Professional elective*	3
	Behavioral and social sciences distribution	3

Fourth Semester

CT286	Construction Planning and Scheduling	3
CT288	Practical Construction Law	3
CT299	Professional Practicum	1
	Professional elective*	3
	Health foundation	1(3)
	Natural sciences lab distribution	4

Total credit hours 60 (62)

*Professional electives: AC 201, BU electives, CT 170, CT 181, CT 183, CT 200 (1 credit unit), CT 291, CT 299 (1 credit unit), MA 152, MA 180, MG 102.

CAD for the Building Professional Certificate (R): 203

CT130	Construction Methods and Materials	3
CT181	Architectural Drafting Techniques	3
CT183	Computer Drafting: Architectural Applications	4
CT223	Computer Drafting: Architectural 3D Presentation	4
CT224	Computer Drafting: Advanced Architectural Applications	4
	English foundation	3
	Mathematics foundation	3

Total credit hours 24

Management of Construction Certificate (R): 142

CT130	Construction Methods and Materials	3
CT131	Construction Plan Reading	3
CT135	Construction Field Operations	3
CT190	Computers in Construction	3
CT212	Construction Management	3
CT284	Construction Estimating	3
CT286	Construction Planning and Scheduling	3
CT288	Practical Construction Law	3
EN101	Techniques of Reading and Writing	3
	Professional electives*	6 (8)

Total credit hours 33 (35)

*Professional electives: AC 201, BU electives, CE 260, CT 170, CT 181, CT 183, CT 199-200, CT 271, CT 283, CT 291, CT 299, MA 100, MA 180, MG 102.

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Careers

Artists create art to communicate ideas, thoughts, or feelings. They use a variety of methods—painting, sculpting, or illustration—and an assortment of materials, including oils, watercolors, acrylics, pastels, pencils, pen and ink, plaster, clay, and computers. Artists' works may be realistic, stylized, or abstract and may depict objects, people, nature, or events.

Art directors develop design concepts and review the material that is to appear in periodicals, newspapers, and other printed or digital media. Fine artists typically display their work in museums, commercial art galleries, corporate collections, and private homes. Painters, illustrators, cartoonists, and sketch artists work with two-dimensional art forms. Sculptors design three-dimensional art works—either by molding and joining materials such as clay, glass, wire, plastic, fabric, or metal or by cutting and carving forms from a block of plaster, wood, or stone. Printmakers create printed images from designs cut or etched into wood, stone, or metal. After creating the design, the artist inks the surface of the woodblock, stone, or plate and uses a printing press to roll the image onto paper or fabric. Teachers act as facilitators or coaches, using interactive discussions and “hands-on” learning to help students learn and apply concepts in subjects such as science, mathematics, or English. Graphic designers plan, analyze, and create visual solutions to communication problems.

Salary

Median annual earnings of salaried art directors were \$61,850 in 2002. Median annual earnings of salaried fine artists, including painters, sculptors, and illustrators were \$35,260 in 2002. Median annual earnings of salaried multimedia artists and animators were \$43,980 in 2002. Median annual earnings of kindergarten, elementary, middle, and secondary school teachers ranged from \$39,810 to \$44,340 in 2002. Median annual earnings of graphic designers were \$36,680 in 2002.

Job Outlook

Employment of artists and related workers is expected to grow as fast as the average for all occupations through the year 2012. Job opportunities for teachers over the next 10 years should be excellent, attributable mostly to the large number of teachers expected to retire.

Education & Training Options

Montgomery College offers an associate of arts degree (A.A.) in arts and sciences in four tracks (art, art education, and art history, and studio art). There are also graphic design and studio art tracks which lead to an associate of fine arts degree, and a certificate in two curricula (A.F.A) (specialized art and studio art). (See *reverse for art curricula*.)

■ Degree

The basic art curriculum provides a foundation of general art courses supplemented by general education requirements, which provide skills that encourage a broad exposure to the arts and prepare students for advanced study and careers in many areas including studio art, art education, graphic design, applied design, museum studies, and art marketing.

■ Certificate

The specialized art certificate curricula is designed for students who want intensive training in drawing painting, printmaking, ceramics, sculpture, or jewelry and metalsmithing. The studio art certificate curriculum is designed to provide a strong foundation in art while offering an opportunity for generalized study.

■ Workforce Training

The College's Workforce Development & Continuing Education Department offers courses in art. For more information, call 301-279-5188.

Contact @ MC

Germantown Campus301-353-7762
Rockville Campus301-279-5115
Takoma Park Campus301-650-1370
www.montgomerycollege.edu

Art Curricula

Degrees, Certificates, and Letters of Recognition

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Take the next step.

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Art (G, TP): 003 Arts and Sciences A.A.

First Semester

AR101	Introduction to Drawing	3
AR103	Two-Dimensional Design	3
AR107	Art History I	3
EN101	Techniques of Reading and Writing	3
	Health foundation	1
	Behavioral and social sciences distribution*	3

Second Semester

AR104	Three-Dimensional Design	3
AR108	Art History II	3
AR115	Figure Drawing I	3
EN102	Techniques of Reading and Writing	3
	Mathematics foundation	3
PE101-199	Physical education elective	1

Third Semester

	AR electives (2)†	6
EN201	or	
EN202	Introduction to World Literature	3
	Humanities distribution	3
	Natural sciences lab distribution	4

Fourth Semester

	AR electives (2)†	6
	Speech foundation	3
	Arts or humanities distribution‡	3
	Behavioral and social sciences distribution*	3
	Natural sciences non-lab or lab distribution	3 (4)

Total credit hours 66 (67)

*The two behavioral and social sciences courses must be in different disciplines.

†Students wishing to pursue an emphasis in studio art, art education, or art history should consult a member of the art faculty for advice on selection of appropriate electives.

‡200-level literature course recommended.

(more)

Art Curricula

(continued)

Art Education (R): 060 Arts and Sciences A.A.

First Semester

AR101	Introduction to Drawing	3
AR103	Two-Dimensional Design	3
AR107	Art History I	3
EN101	Techniques of Reading and Writing	3
	Speech foundation	3
	Foreign language elective*	3

Second Semester

AR104	Three-Dimensional Design	3
AR108	Art History II	3
AR115	Figure Drawing I	3
EN102	Techniques of Reading and Writing	3
	Health foundation	1
PE101–199	Physical education elective	1
	Foreign language elective*	3

Third Semester

	Mathematics foundation	3
	Behavioral and social sciences distribution†	3
	Natural sciences non-lab or lab distribution	3 (4)
	Art history elective	3
	Foreign language elective*	3

Fourth Semester

	Behavioral and social sciences distribution†	3
	Natural sciences lab distribution	4
	Art history elective	3
	Foreign language elective*	3
	Literature elective‡	3

Total credit hours 66 (67)

*Select AR 213, AR 214, AR 223, AR 224, or AR 226.

†Cannot be a psychology course.

‡Students planning to transfer to institutions requiring a foreign language are advised to elect a foreign language.

Art History (R): 059 Arts and Sciences A.A.

First Semester

AR101	Drawing I	3
AR103	Design I	3
AR107	Art History I	3
EN101	Techniques of Reading and Writing	3
	Speech foundation	3
	Foreign language elective*	3

Second Semester

AR102	Drawing II	3
AR104	Design II	3
AR108	Art History II	3
EN102	Techniques of Reading and Writing	3
	Health foundation	1
PE101–199	Physical education elective	1
	Foreign language elective*	3

Third Semester

	Mathematics foundation	3
	Behavioral and social sciences distribution†	3
	Natural sciences non-lab or lab distribution	3 (4)
	Art history elective	3
	Foreign language elective*	3

Fourth Semester

	Behavioral and social sciences distribution†	3
	Natural sciences lab distribution	4
	Art history elective	3
	Foreign language elective*	3
	Literature elective‡	3

Total credit hours 66 (67)

*French or German is recommended.

†Must be taken from different disciplines. One multicultural course is required from art, humanities, or behavioral and social sciences distribution.

‡Course should be selected from humanities distribution list.

(more)

Art Curricula

(continued)

Graphic Design: 902A A.F.A.

First Semester

AR101	Introduction to Drawing	3
AR103	Two-Dimensional Design	3
AR105	Color Theory and Application	3
AR107	Art History I	3
DS107	College Survival*	(1)
EN101	Techniques of Reading and Writing	3

Second Semester

AR104	Three-Dimensional Design	3
AR108	Art History II	3
AR114	Intermediate Drawing	3
AR115	Figure Drawing I	3
EN102	Techniques of Reading and Writing	3

Third Semester

AA110	Computer Essentials for the Graphic Designer	4
AR275	Professional Practice for the Visual Artist*	(1)
GD210	Graphic Design I	3
GD220	Typography I	3
	Mathematics foundation	3
	Behavioral and social sciences distribution	3

Fourth Semester

GD211	Graphic Design II	3
GD221	Typography II	3
	Studio elective†	3
	Humanities distribution	3
	Natural sciences distribution	3(4)

Total credit hours 61(64)

*This course is only required for students in the School of Art and Design.

†Select any AR studio course or AA 134, AA 135, AA 212, AA 214, AA 216, or AA 234.

Studio Art (R): 062 Arts and Sciences A.F.A.

First Semester

AR101	Introduction to Drawing	3
AR103	Two-Dimensional Design	3
AR107	Art History I	3
EN101	Techniques of Reading and Writing	3
	Health foundation	1
	Mathematics foundation	3

Second Semester

AR104	Three-Dimensional Design	3
AR105	Color Theory and Application	3
AR108	Art History II	3
AR115	Figure Drawing I	3
EN102	Techniques of Reading and Writing	3
	Behavioral and social sciences distribution*	3

Third Semester

	AA, AR, or ID elective†	3
	Crafts elective‡	3
	Printmaking elective**	3
	Behavioral and social sciences distribution*	3
	Humanities distribution	3
	Natural sciences non-lab or lab distribution	3 (4)

Fourth Semester

AR201	Painting I	3
AR221	Sculpture I	3
	AA, AR, or ID elective	3
PE101-199	Physical education elective	1
	Speech foundation	3
	Natural sciences lab distribution	4

Total credit hours 69 (70)

*Must be taken from different disciplines. One multicultural course is required from art, humanities, or behavioral and social studies distribution.

†CG 120 or PG 150 is recommended.

‡Select AR 121, AR 123, AR 124, or AR 229.

**Select AR 213, AR 214, AR 223, AR 224, or AR 226.

(more)

Art Curricula

(continued)

Studio Art: 900A A.F.A. Statewide Program

First Semester

AR101	Introduction to Drawing	3
AR103	Two-Dimensional Design	3
AR105	Color Theory and Application	3
AR107	Art History I	3
DS107	College Survival*	(1)
EN101	Techniques of Reading and Writing	3

Second Semester

AR104	Three-Dimensional Design	3
AR108	Art History II	3
AR114	Intermediate Drawing	3
AR115	Figure Drawing I	3
EN102	Techniques of Reading and Writing	3

Third Semester

AR201	Painting I	3
AR215	Figure Drawing II	3
AR221	Sculpture I	3
AR275	Professional Practice for the Visual Artist*	(1)
	Mathematics foundation	3
	Behavioral and social sciences distribution	3(4)

Fourth Semester

	Electives†	9
	Humanities distribution	3
	Natural sciences distribution	3(4)

Total credit hours 60(63)

*This course is only required for students in the School of Art and Design.

†Select 6 credits from any AR studio courses and 3 credits from any AR studio course, any GD course, or AA 134, AA 135, AA 212, AA 214, AA 216, or AA 234.

Specialized Art Certificate: 211

Art History Requirement (3 credit hours)

Select from:

AR 107	Art History I,
AR 108	Art History II, or
AR 127	Art Appreciation (Art in Culture)

Drawing (select 12 credit hours)

AR101	Drawing I	3
AR102	Drawing II	3
AR280A	Studio Practicum	3
AR281A	Studio Practicum	3
AR285A	Individualized Art Workshop	3

Painting (select 12 credit hours)

AR201	Painting I*	3
AR202	Painting II	3
AR205	Watercolor I*	3
AR206	Watercolor II	3
AR280B	Studio Practicum	3
AR281B	Studio Practicum	3
AR285B	Individualized Art Workshop	3

Printmaking (select 12 credit hours)

Select two courses from the following: 6

AR213	World Woodcut and Relief Traditions†
AR214	Printmaking: Lithography†
AR223	Lithography and Relief Printmaking†
AR224	Intaglio Printmaking

Select two courses from the following: 6

AR225	Seriography
AR226	Monotype Workshop
AR280C	Studio Practicum
AR281C	Studio Practicum
AR285C	Individualized Art Workshop

(more)

Art Curricula

(continued)

Specialized Art Certificate (continued)

Ceramics (select 12 credit hours)

AR121	Ceramics I	3
AR122	Ceramics II	3
AR280D	Studio Practicum	3
AR281D	Studio Practicum	3
AR285D	Individualized Art Workshop	3

Sculpture (select 12 credit hours)

AR221	Sculpture I*	3
AR222	Sculpture II	3
AR280E	Studio Practicum	3
AR281E	Studio Practicum	3
AR285E	Individualized Art Workshop	3

Jewelry and Metalsmithing (select 12 credit hours)

<i>Select two courses from the following:</i>		6
AR123	Crafts	
AR124	Enameling I	
AR125	Enameling II	
AR229	Jewelry and Metalsmithing	

<i>Select two courses from the following:</i>		6
AR280G	Studio Practicum	
AR281G	Studio Practicum	
AR285G	Individualized Art Workshop	

Total credit hours (for each area) 15

*Students must either complete the prerequisites (AR 102 and AR 103 for AR 201; AR 101 for AR 205; AR 103 and AR 104 for AR 221) or have them waived by consent of the department.

†Students may not receive credit for both AR 223 and AR 213 or AR 214.

Studio Art Certificate: 212

General Art Requirements (18 credit hours)

AR101	Drawing I	3
AR102	Drawing II	3
AR103	Design I	3
AR104	Design II	3
AR105	Color	3

Select one of the following: 3

AR107	Art History I	
AR108	Art History II	
AR127	Art Appreciation (Art in Culture)	

Studio Art Electives (12 credit hours)

Select from the following courses:

AR 112, AR 113, AR 121, AR 122, AR 123, AR 124, AR 125, AR 201, AR 202, AR 203, AR 204, AR 205, AR 206, AR 213, AR 214, AR 221, AR 222, AR 223*, AR 224, AR 225, AR 226, AR 227, AR 229, AR 280A–AR 280G, AR 281A–AR 281G, AR 285A–AR285L.

Total credit hours 30

*Students cannot also receive credit for AR 213 or AR 214.

Careers

The successful service technician for today's automobile must possess a working knowledge of various vehicle systems and their inter-relationships. The technician should be able to diagnose, service, and repair the vehicle under a variety of working conditions. Automotive workers use computerized shop equipment and work with electronic components, while maintaining their skills with traditional hand tools.

Career opportunities include dealership personnel, writers, technicians, diagnosticians, and advisers; manufacturers' representatives for service and parts; and self employment.

Salary

Automotive service technicians' median hourly earnings were \$14.71 in 2002 based on experience and ability. Experienced technicians employed by automotive dealers and independent repair shops may receive commissions related to labor costs.

Job Outlook

With the advent of automotive electronics, microcomputer controls, and emissions regulations, there is an increasing need for technicians with logical thinking patterns, good communication skills, and mechanical expertise.

Employment of automotive service technicians and mechanics is expected to grow as fast as the average through 2012.

Education & Training Options

For many positions, a two year post-secondary degree with practical understanding of electronics and mechanics will be a minimum requirement.

Montgomery College offers an associate of applied science degree (A.A.S.) and certificate options for automotive technology. (*See reverse for automotive technology curricula.*)

■ Degree

The automotive technology curriculum prepares career students for employment by providing competencies in basic mechanics, automotive sciences, including physical, electrical, and chemical principles; and automotive diagnostics and repair for all certifiable areas. Students may select electives to enhance specialized competencies or interests.

■ Certificate

Five certificate programs are offered for students who want to prepare for employment:

- (1) automotive air conditioning specialist;
- (2) automotive drive train specialist;
- (3) automotive driveability specialist;
- (4) automotive electrical systems specialist; and
- (5) automotive suspension, brake, and alignment specialist.

■ Skills Upgrade

The automotive technology courses included in the curriculum fulfill some of the course requirements to sit for A.S.E. certification exams.

Contact @ MC

Rockville Campus301-251-7601
www.montgomerycollege.edu

Automotive Technology Curricula

Degrees, Certificates, and Letters of Recognition

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Automotive Technology A.A.S. (R): 307

First Semester

AT101	Introduction to Automotive Technology	3
AT105	Automotive Science	3
AT115	Automotive Electricity I	4
CH109A/B	Chemistry and Society/ Chemistry and Society Laboratory*	
	or	
	Natural sciences lab distribution	4
EN101	Techniques of Reading and Writing	3

Second Semester

AT107	Internal Combustion Engines	4
AT116	Automotive Electricity II	4
	English foundation	3
	Mathematics foundation	3
	Behavioral and social sciences distribution	3

Third Semester

AT221	Automotive Fuel Systems I	4
	AT electives (2)†	8
	Health foundation	1
SP108	Introduction to Human Communication	
	or	
	Speech foundation	3

Fourth Semester

AT222	Automotive Fuel Systems II	4
AT251	Automotive Technology Practicum‡	1 (4)
	AT electives (2)†	8
	Arts or humanities distribution	3

Total credit hours 66 (69)

*If the student chooses this chemistry course instead of another natural sciences distribution course, both CH 109A and CH 109B must be taken.

†Select from AT 109, AT 110, AT 225, AT 227, AT 229, and AT 231.

‡AT 251 may be taken any time after AT 101 and AT 115. Students should consider taking AT 251 during the summer.

(more)

Automotive Technology Curricula

(continued)

Automotive Air Conditioning Specialist Certificate (R): 164

AT101	Introduction to Automotive Technology	3
AT105	Automotive Science	3
AT115	Automotive Electricity I	4
AT229	Automotive Air Conditioning AT elective	4
EN101	Techniques of Reading and Writing MA elective	3
Total credit hours		24

Automotive Drive Train Specialist Certificate (R): 161

AT101	Introduction to Automotive Technology	3
AT105	Automotive Science	3
AT107	Internal Combustion Engines	4
AT115	Automotive Electricity I	4
AT225	Automotive Power Train	4
AT227	Automotive Transmissions and Transaxles AT elective	4
EN101	Techniques of Reading and Writing MA elective	3
Total credit hours		32

Automotive Driveability Specialist Certificate (R): 160

AT101	Introduction to Automotive Technology	3
AT107	Internal Combustion Engines	4
AT115	Automotive Electricity I	4
AT116	Automotive Electricity II	4
AT221	Automotive Fuel Systems I	4
AT222	Automotive Fuel Systems II	4
AT231	Engine Diagnosis and Tune-up	4
EN101	Techniques of Reading and Writing MA elective	3
Total credit hours		33

Automotive Electrical Systems Specialist Certificate (R): 162

AT101	Introduction to Automotive Technology	3
AT105	Automotive Science	3
AT115	Automotive Electricity I	4
AT116	Automotive Electricity II AT elective	4
EN101	Techniques of Reading and Writing MA elective	3
Total credit hours		24

Automotive Suspension, Brake, and Alignment Specialist Certificate (R): 163

AT101	Introduction to Automotive Technology	3
AT105	Automotive Science	3
AT109	Automotive Suspension and Brakes	4
AT110	Automotive Steering and Alignment AT elective	4
EN101	Techniques of Reading and Writing MA elective	3
Total credit hours		24

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Careers

Biological resources engineers examine the relationships between mankind, other living things, and the environment. Biological resources engineers are involved in a wide range of activities ranging from biomedical engineering to urban wildlife management to water resources engineering. Biological resources engineers can choose from a variety of focus areas including biomedical engineering, bioenvironmental and ecosystem engineering, biotechnological engineering, pre-medicine, pre-veterinary, plant and wildlife resources management, land and water resources management, and environmental education and park management.

Salary

Median annual earnings of biomedical engineers were \$60,410 in 2002. Median annual earnings of geoscientists were \$67,470 in 2002. Median annual earnings of environmental engineers were \$47,600 in 2002. Median annual earnings of geoscientists were \$67,470 in 2002.

Job Outlook

Employment of biomedical engineers is expected to increase faster than the average for all occupations through 2012. Employment of environmental engineers is expected to increase much faster than the average for all occupations through 2012. Employment of environmental engineers is expected to increase much faster than the average for all occupations through 2012. Overall employment of environmental scientists and geoscientists is expected to grow about as fast as the average for all occupations through 2012.

Education & Training Options

Montgomery College offers a biological resources engineering track in its engineering science A.S. curriculum. (*See reverse for biological resources curriculum.*)

Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering. All have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, including several veterans of many years at the College, who add their own special expertise on the world beyond academia.

Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in biological resources engineering to:

University of Maryland College Park—follow the curriculum as published in the Montgomery College Catalog.

Johns Hopkins University—follow the general engineering track.

Another engineering school—consult with a Montgomery College adviser.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Biological Resources Engineering Curricula

Degrees, Certificates, and Letters of Recognition

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Take the next step.

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Biological Resources Engineering: 411 Engineering Science A.S.

First Semester

CH102	Principles of Chemistry II	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
MA181	Calculus I	4
	Behavioral and social sciences distribution	3

Second Semester

BI107	Principles of Biology I	4
CH120	Essentials of Organic and Biochemistry	4
	Health foundation	1
MA182	Calculus II	4
PH161	General Physics I	3

Third Semester

BI203	Microbiology	4
EC201	Principles of Economics I	3
ES102	Statics	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4

Fourth Semester

ES220	Mechanics of Materials*	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Arts distribution	3
	Humanities distribution	3

Total credit hours 67

*Students may substitute ES 232.

Careers

Biological technicians assist biologists and other scientists who study living organisms and conduct medical research. Entry-level workers in the biotechnology field perform laboratory work, such as DNA isolation or sequencing, cell culture, toxicology, or vaccine sterility testing, antibody production and development of diagnostic and therapeutic agents. Most work in research and testing firms, drug manufacturing firms, or for federal, state, or local governments.

Salary

In 2003, the average annual salary for biological science technicians in the federal government was \$30,440. According to online career sites, a biomedical engineering technician with an A.A. and two to four years' experience may earn \$35,500 to \$39,000 annually.

Job Outlook

Continued growth of scientific and medical research, combined with stronger competition among drug companies and an aging population are expected to increase the need for biological technicians through 2012. Employers will continue to seek individuals who are well-trained on equipment used in laboratories and production facilities, as well as individuals with highly developed technical and communication skills.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) and a certificate option in biotechnology. (*See reverse for biotechnology curricula.*)

■ Degree

The biotechnology program is designed to prepare students for both academic achievement and employment in biotechnology. The program emphasizes applied laboratory skills relevant to the biotechnology industry. Core introductory courses in biotechnology, biology, chemistry, and mathematics prepare students for rigorous upper-level second-year applied course work.

Optional biotechnology practicums are available for off-campus training at local partner biotechnology companies for students who qualify.

Students who complete the A.A.S. in biotechnology may transfer to another institution and earn a B.S. or M.S. in a biological science.

■ Certificate

A biotechnology certificate program is offered for students who want to prepare for immediate employment in the biotechnology field.

■ Workforce Training

The College's Workforce Development & Continuing Education Department offers noncredit courses in biotechnology and related areas. For more information, call 301-279-5188.

■ Skills Upgrade

The biotechnology A.A.S. curriculum is suitable for students currently working in the biotechnology or medical technology field who want to upgrade their skills or for those who have a bachelor's degree in the life sciences and want additional training.

Contact @ MC

Germantown Campus301-353-1910
www.montgomerycollege.edu

Biotechnology Curricula

Biotechnology A.A.S. (G): 334 Statewide Program

General Education and Other Requirements (23 credit hours)

BI107	Principles of Biology I	4
EN101	Techniques of Reading and Writing	3
	English foundation	3
	Health foundation	1
	Mathematics foundation	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3

Biotechnology Core Requirements (33–34 credit hours)

BI203	Microbiology	4
BI209	General Genetics	4
BT101	Introduction to Biotechnology	2
BT117	Cell Culture and Cell Function	3
BT200	Protein Biotechnology	4
BT204	Basic Immunology and Immunological Methods	4
BT213	Nucleic Acid Methods	4
CH101	Principles of Chemistry I	4
CH120	Essentials of Organic and Biochemistry	
	or	
CH203	Organic Chemistry I	4(5)

Electives (select a minimum of 5 credit hours)

BT115	Instrumentation for the Biotechnology Laboratory	3
BT221	Biotechnology Practicum	1-3
CA120	Introduction to Computer Applications	3
CH102	Principles of Chemistry II	4
CH204	Organic Chemistry II	5
	MA elective	3
	Total credit hours	61(62)

Biotechnology Certificate (G): 219

BT101	Introduction to Biotechnology	2
BT115	Instrumentation for the Biotechnology Laboratory	3
BT117	Cell Culture and Cell Function	3
BT200	Protein Biotechnology	4
BT204	Basic Immunology and Immunological Methods	4
BT213	Nucleic Acid Methods	4
	Total credit hours	20

Degrees, Certificates, and Letters of Recognition

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Careers

Building trades technicians are skilled craftspeople who take building projects from concept to completion. They use acquired skills and qualifications in building trades technology, combined with knowledge in a specialized area of carpentry, plumbing, electricity, heating, ventilating, or air conditioning.

Career options include carpenter, HVAC technician, plumber, electrician, skilled trades supervisor, building codes official, property management technician, builder, and remodeler. Many skilled craftspeople become self-employed after several years of field experience.

Salary

Entry-level general laborer positions start in the \$20,000 to \$25,000 range. In 2002, median hourly earnings of electricians were \$19.90; of carpenters were \$16.64; of plumbers were \$19.31; and of heating, air-conditioning, and refrigeration mechanics and installers were \$16.78.

Job Outlook

As the population and economy grow, more building trades employees will be needed to install and maintain electrical, plumbing, and air systems in homes, factories, offices, and other structures.

Employment for these occupations is expected to grow faster than the average through 2012.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.), a certificate program, and letters of recognition in building trades technology. The College's building trades technology program is approved by the Suburban Maryland Industry Association and developed with its assistance. (*See reverse for building trades technology curricula.*)

■ Degree

The building trades technology degree program provides a comprehensive mixture of academic and practical training in the areas involved in residential building trades technology. Specialized areas of study may be selected in carpentry; electrical; heating, ventilation, and air conditioning/refrigeration (HVAC-R); or plumbing. Practical hands-on lab work complements course work.

■ Certificate

Certificates are offered for building trades technology and building remodeling and repair, as well as letter of recognition options for carpentry, electricity, HVAC/R, and plumbing. Students who complete the certificate may continue study toward the associate's degree in building trades technology.

■ Workforce Training

Building and construction courses are offered throughout the year through the College's Workforce Development & Continuing Education Office. For more information, call 301-279-5188.

Contact @ MC

Rockville Campus301-251-7688
www.montgomerycollege.edu

Building Trades Technology Curricula

Degrees, Certificates, and Letters of Recognition

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Building Trades Technology A.A.S. (R): 308

General Education and Other Requirements (23 credit hours)

EN101	Techniques of Reading and Writing	3
	English foundation	3
HE100	Principles of Healthier Living	
	or	
	Health foundation	1
	Mathematics foundation	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

Building Trades Fundamental Requirements (23 credit hours)

BU130	Introduction to the Building Trades	3
BU140	Carpentry I	4
	or one of the following:	
BU144	Electricity I	
BU146	Plumbing I	
BU148	Heating, Ventilation, and Air Conditioning/Refrigeration I	
BU240	Carpentry II	4
	or one of the following:	
BU244	Electricity II	
BU246	Plumbing II	
BU248	Heating, Ventilation, and Air Conditioning/Refrigeration II	
BU250	Safety for the Building Trades	3
CT130	Construction Methods and Materials	3
CT131	Construction Plan Reading	3
CT135	Construction Field Operations	3

Professional Electives (15–17 credit hours)

Select from BU 140, BU 144, BU 146, BU 148, BU 240, BU 244, BU 246, BU 248, CE 260, CE 261, CT 212, CT 284, and CT 299.

Total credit hours 61–63

(more)

Building Trades Technology Curricula

(continued)

Building Trades Technology Certificate (R): 179

BU130	Introduction to the Building Trades	3
BU140	Carpentry I	4
	or one of the following:	
BU144	Electricity I	
BU146	Plumbing I	
BU148	Heating, Ventilation, and Air Conditioning/Refrigeration I	
BU240	Carpentry II	4
	or one of the following:	
BU244	Electricity II	
BU246	Plumbing II	
BU248	Heating, Ventilation, and Air Conditioning/Refrigeration II	
	Professional electives*	6
	Total credit hours	17

*Professional electives: BU 250, CE 260, CT 131, CT 135.

Building Remodeling and Repair Certificate (R): 236

BU131	Building Trades Blueprint Reading	3
BU140	Carpentry I	4
BU240	Carpentry II	4
	Professional electives*	8
	Total credit hours	19

*Select from BU 144, BU 146, and BU 149.

Carpentry Letter of Recognition (R): 810

BU140	Carpentry I	4
BU240	Carpentry II	4
	Total credit hours	8

Electricity Letter of Recognition (R): 807

BU144	Electricity I	4
BU244	Electricity II	4
	Total credit hours	8

HVAC/R Letter of Recognition (R): 808

BU148	Heating, Ventilation, and Air Conditioning/Refrigeration I	4
BU248	Heating, Ventilation, and Air Conditioning/Refrigeration II	4
	Total credit hours	8

Plumbing Letter of Recognition (R): 809

BU146	Plumbing I	4
BU246	Plumbing II	4
	Total credit hours	8

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Careers

Chemical engineers work to improve the efficiency of chemical processes. They also design equipment for the chemical industry. Chemical engineering technicians usually are employed in industries producing pharmaceuticals, chemicals, and petroleum products, among others. They work in laboratories and processing plants, help develop new chemical products and processes, test processing equipment and instrumentation, gather data, and monitor quality. Many chemical engineers ultimately find career opportunities in industry, in an academic setting, or in public and private institutes and agencies.

Salary

According to a 2003 salary survey by the National Association of Colleges and Employers, bachelor's degree candidates in chemical engineering received starting offers averaging \$52,384 a year.

Median annual earnings of chemical engineers were \$72,490 in 2002.

Job Outlook

Although overall employment in the chemical manufacturing industry is expected to decline through 2012, chemical companies will continue to research and develop new chemicals and more efficient processes in manufacturing.

Education & Training Options

Montgomery College offers a chemical engineering track in its engineering science A.S. curriculum. (*See reverse for chemical engineering curriculum.*)

■ Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering. All have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, including several veterans of many years at the College, who add their own special expertise on the world beyond academia.

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in chemical engineering to:

- University of Maryland College Park—follow the curriculum as published in the *Montgomery College Catalog*.
- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Chemical Engineering Curricula

Degrees, Certificates, and Letters of Recognition

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Chemical Engineering: 406 Engineering Science A.S.

First Semester

CH102	Principles of Chemistry II	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Humanities distribution	3

Third Semester

CH203	Organic Chemistry I	5
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Behavioral and social sciences distribution	3

Fourth Semester

CH204	Organic Chemistry II	5
MA282	Differential Equations	3
PH263	General Physics III	4
	Arts distribution	3
	Behavioral and social sciences distribution	3

Total credit hours 62

Careers

Civil engineers design and supervise the construction of roads, buildings, airports, tunnels, dams, bridges, and water supply and sewage systems.

The major specialties within civil engineering are structural, water resources, environmental, construction, transportation, and geotechnical engineering.

Civil engineering technicians help civil engineers plan and build highways, buildings, bridges, dams, wastewater treatment systems, and perform related surveys and studies. Some may prepare drawings or perform land-surveying duties. Others may set up and monitor instruments used to study traffic conditions.

Salary

In 2002, median annual earnings of civil engineers were \$60,070, while civil engineering technicians salaries ranged from \$21,800 to \$54,770 (U.S. Department of Labor).

Job Outlook

General growth is expected to increase more slowly than the average through 2012. Civil engineers will be needed to design and construct transportation systems, water supply and pollution control systems, and large buildings to accommodate population growth. They will also be needed to repair or replace roadways, bridges, and other public structures.

Education & Training Options

Montgomery College offers a civil engineering track in its engineering science A.S. curriculum. (See reverse for civil engineering curriculum.)

■ Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering. All have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, including several veterans of many years at the College, who add their own special expertise on the world beyond academia.

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in civil engineering to:

- University of Maryland College Park—follow the curriculum as published in the *Montgomery College Catalog*.
- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Civil Engineering Curricula

Degrees, Certificates, and Letters of Recognition

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Civil Engineering: 407 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers†	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Arts distribution	3
	Humanities distribution	3

Third Semester

ES220	Mechanics of Materials	3
ES221	Dynamics	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Behavioral and social sciences distribution	3

Fourth Semester

ES232	Thermodynamics	3
ES240	Scientific and Engineering Computation	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Behavioral and social sciences distribution	3

Total credit hours 64*

*ENCE 202 Computational Methods in Civil Engineering should be taken at University of Maryland College Park in order to achieve full junior standing upon transfer.

†Students may substitute CH 102.

Careers

With training in communication and broadcasting technology, careers can include announcers, disc jockeys, newscasters or anchors, broadcast and sound engineering technicians, and digital multimedia production assistants.

Announcers in radio (disk jockeys) and television (newscasters or anchors) perform a variety of tasks on and off the air. They announce station program information such as program schedules and station breaks for commercials or public service information, and they introduce and close programs.

Broadcast and sound engineering technicians install, test, repair, set up, and operate the electronic equipment used to record and transmit radio and television programs, cable programs, and motion pictures.

Salary

Median hourly earnings of announcers in 2002 were \$9.91 in the radio and television broadcasting industry. Earnings are higher in television than in radio, and higher in commercial than in public broadcasting.

Median annual earnings of broadcast technicians in 2002 were \$27,760. Median annual earnings of sound engineering technicians in 2002 were \$36,970.

Job Outlook

Employment of announcers is expected to decline through 2012 due to the lack of growth of new radio and television stations. Openings in this relatively small field also will arise from the need to replace those who transfer to other kinds of work or leave the labor force.

People seeking entry-level jobs as technicians in the field of radio and television broadcasting are expected to face strong competition in

major metropolitan areas, where pay generally is higher and the number of qualified job seekers exceeds the number of openings. There, stations seek highly experienced personnel. Prospects for entry-level positions generally are better in small cities and towns for beginners with appropriate training.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S) in communication and broadcasting technology, including educational tracks in radio and television and four certificate programs. (See *reverse for communication and broadcasting technology curricula.*)

■ Degree

There are two programs leading to the A.A.S. in communication and broadcasting technology. Students in either the (1) radio or (2) television A.A.S. track study broad industry-wide topics, including an introduction to broadcasting, audio production techniques, broadcast journalism, broadcast management, and basic television production.

■ Certificate

Students interested in concentrated career preparation without the General Education component may choose certificate curricula in broadcast journalism, digital multimedia production (which provides technical skills training in digital videography and video editing and digital audio production), radio production, or television production.

Contact @ MC

Rockville Campus301-279-5256
www.montgomerycollege.edu

Communication and Broadcasting Technology Curricula

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(more)

Radio (R): 309 Communication and Broadcasting Technology A.A.S.

First Semester

CH135	General Chemistry for Engineers†	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Arts distribution	3
	Humanities distribution	3

Third Semester

ES220	Mechanics of Materials	3
ES221	Dynamics	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Behavioral and social sciences distribution	3

Fourth Semester

ES232	Thermodynamics	3
ES240	Scientific and Engineering Computation	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Behavioral and social sciences distribution	3

Total credit hours 64

Broadcast Journalism Certificate (R): 207

EN101	Techniques of Reading and Writing	3
TR101	Digital Video/Audio	4
TR129	Introduction to Broadcasting	3
TR130	Television Production	4
TR131	Audio Production Techniques	4
TR139	Writing for Television and Radio	3
TR237	Broadcast Journalism	3
TR240	Advanced Television Production	4
TR255	Advanced Broadcast Journalism	3
TR258	Electronic Field Production	3

Total credit hours 34

Communication and Broadcasting Technology Curricula

(continued)

Television (R): 310 Communication and Broadcasting Technology A.A.S.

First Semester

EN101	Techniques of Reading and Writing	3
TR101	Digital Video/Audio	4
TR130	Television Production	4
TR131	Audio Production Techniques	4

Second Semester

	English foundation	3
TR129	Introduction to Broadcasting	3
TR139	Writing for Television and Radio	3
TR240	Advanced Television Production	4
TR258	Electronic Field Production	3

Third Semester

	Health foundation	1 (3)
	Mathematics foundation	3
	Speech foundation	3
TR104	Media Appreciation	3
TR237	Broadcast Journalism	3
TR238	Television Directing	3

Fourth Semester

TR249	Broadcast Management and Engineering	3
TR255	Advanced Broadcast Journalism	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

Total credit hours 60 (62)

Digital Multimedia Production Certificate (R): 214

TR101	Digital Video/Audio	4
TR145	Digital Audio for Multimedia	4
TR155	Digital Videography	4
	or	
CG210	Computer Animation and Illustration	4
TR295	Advanced Digital Multimedia Production	4

Total credit hours 16

Radio Production Certificate (R): 208

EN101	Techniques of Reading and Writing	3
TR129	Introduction to Broadcasting	3
TR131	Audio Production Techniques	4
TR215	Computers in Radio	3
TR233	Radio Production	4
TR249	Broadcasting Management and Engineering	3
TR256	Radio Station Operation	3

Total credit hours 23

Television Production Certificate (R): 209

EN101	Techniques of Reading and Writing	3
TR101	Digital Video/Audio	4
TR129	Introduction to Broadcasting	3
TR130	Television Production	4
TR131	Audio Production Techniques	4
TR238	Television Directing	3
TR240	Advanced Television Production	4
TR258	Electronic Field Production	3

Total credit hours 28

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Careers

Individuals with a two-year degree in computer applications are employed in a broad range of industries that require information technology support, computer applications, and Web development skills, including: administrative services manager, data entry, desktop publisher, help desk support, Web designer/producer, Web content developer, webmaster.

Salary

Median annual earnings of computer support specialists were \$39,100 in 2002. Median annual earnings of desktop publishers were \$31,620 in 2002. Earnings for administrative services managers vary greatly, depending on responsibilities, education, employer, and geographic location. In general, median annual earnings were \$52,500 in 2002.

Salary ranges depend on skill levels and responsibilities. Starting salaries for a data entry keyer in 2002 were \$22,390.

Online career sites show help desk support positions offered at annual salary range from \$27,500 to \$56,500 in 2003.

Depending on the position, employees with bachelor's degrees earn more on average than non-degree employees.

Job Outlook

Employment of computer support specialists and systems administrators is expected to increase faster than the average for all occupations through 2012. Employment growth reflects the rapid pace of improved technology data and communications, network security demands, and continued e-commerce.

Education & Training Options

Montgomery College offers an associate of applied science degree, two certificate programs, and one letter of recognition program in computer applications. There are two tracks in this degree program:

- (1) administrative support technology
 - (2) information technology
- (See reverse for computer applications curricula.)

■ Degree

- **administrative support technology**—provides skills to attain an administrative assistant or office support staff position.
- **information technology**—prepares students for a wide variety of positions involving the use of applications software.

■ Certificate

Two certificates are offered:

- (1) administrative support technology and
- (2) information technology. A **letter of recognition** is offered for administrative support technology.

■ Workforce Training

The College's Workforce Development & Continuing Education Department offers courses throughout the year. Call 301-279-5188 for more information.

Contact @ MC

Rockville Campus301-279-5185
www.montgomerycollege.edu/ca

Computer Applications Curricula

Degrees, Certificates, and Letters of Recognition

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Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

Math, English, and reading assessment tests are required prior to registering. (Some students may be exempt from assessment. Consult the *Montgomery College Catalog* for criteria.) Financial aid and scholarships are available to qualified candidates.

Take the next step.

Complete an Application for Admission form (available online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Computer Applications A.A.S.: 311

General Education and Other Requirements (23 credit hours)

EN101	Techniques of Reading and Writing	3
	English foundation	3
	Health foundation	1
	Mathematics foundation	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

Administrative Support Technology Track (39 credit hours)

CA101	Computer Keyboarding	3
CA103	Office Communications Skills for Information Processing	3
CA104	Professional Business Procedures	3
CA106	Computer Use and Management	3
CA131	Introduction to Word Processing Applications	3
CA141	Introduction to Database Applications or	
CA172	Internet and Web Literacy	3
CA151	Introduction to Spreadsheet Applications	3
CA160	Computer Presentations	3
CA232	Advanced Word Processing Applications	3

Electives

	Select from AC 201, AC 202, CA 100, CA 102, CA 120, CA 141, CA 161, CA 172, CA 240, CA 242, CA 252, CA 270, CA 271, CG 120, CS 110, and MG 101	12
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Total credit hours for administrative support technology track 62

(more)

Computer Applications Curricula

(continued)

Computer Applications A.A.S.: 311	
<i>continued</i>	
Information Technology Track	
(39 credit hours)	
CA106	Computer Use and Management 3
CA131	Introduction to Word Processing Applications 3
CA141	Introduction to Database Applications 3
CA151	Introduction to Spreadsheet Applications 3
CA270	Microcomputer Systems Evaluation 3
CS110	Computer Concepts 3
<i>Select two of the following:</i>	
CA232	Advanced Word Processing Applications 3
CA240	Advanced Database Applications 3
CA252	Advanced Spreadsheet Applications 6
Electives	
At least 9 credits must be in CA courses; the remainder must be in CA or related areas (AA, AC, BA, CG, CS, MG, NW, PR) 15	
Total credit hours for information technology track 62	
Administrative Support Technology Certificate (R): 195	
CA101	Computer Keyboarding 3
CA103	Office Communications Skills for Information Processing 3
CA104	Professional Business Procedures 3
CA106	Computer Use and Management 3
CA131	Introduction to Word Processing Applications 3
CA151	Introduction to Spreadsheet Applications 3
CA160	Computer Presentations 3
CA232	Advanced Word Processing Applications 3
EN101	Techniques of Reading and Writing 3
Elective	
Select CA 120, CA 141, CA 161, or CA 172 3	
Total credit hours 30	

Information Technology Certificate: 213	
CA106	Computer Use and Management 3
CA131	Introduction to Word Processing Applications 3
CA141	Introduction to Database Applications 3
CA151	Introduction to Spreadsheet Applications 3
CA270	Microcomputer Systems Evaluation 3
CS110	Computer Concepts 3
<i>Select two of the following courses:</i>	
CA232	Advanced Word Processing Applications 3
CA240	Advanced Database Applications 3
CA252	Advanced Spreadsheet Applications 6
<i>Select two of the following courses:</i>	
AC201	Principles of Accounting I, any CA course 6–8
AC202	Principles of Accounting II
MG205	Organizational Behavior 6–8
Total credit hours 30–32	
Administrative Support Technology Letter of Recognition (R): 803	
CA101	Computer Keyboarding 3
CA104	Professional Business Procedures 3
CA131	Introduction to Word Processing Applications 3
Total credit hours 9	

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Careers

Computer engineering, sometimes mixed with systems engineering, is one of the newest disciplinary specializations found in engineering schools. It deals with all aspects, both hardware and software, of the computer industry.

Computer hardware engineers research, design, develop, and test computer hardware and supervise its manufacture and installation.

Computer software engineers create, design, and develop computer applications software and systems that control computers, based on users' needs.

Salary

Median annual earnings of computer hardware engineers were \$72,150 in 2002.

According to the National Association of Colleges and Employers, starting salaries in 2003 for bachelor's degree candidates in computer engineering averaged \$51,343 a year. According to Robert Half International, starting salaries for software engineers in software development ranged from \$62,750 to \$92,000 the same year.

Job Outlook

Computer software engineers are projected to be the fastest growing occupation to 2010, driven by competition among businesses, and increasingly sophisticated technological innovations.

Education & Training Options

Montgomery College offers a computer engineering track in its engineering science A.S. curriculum. (*See reverse for computer engineering curriculum.*)

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in computer engineering to:

- University of Maryland College Park—follow the curriculum as published in the *Montgomery College Catalog*.
- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

■ Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering and have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, who add their own special expertise on the world beyond academia.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Computer Engineering Curriculum

Degrees, Certificates, and Letters of Recognition

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Computer Engineering: 409 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers*	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
MA181	Calculus I	4

Second Semester

CS103	Computer Science I	4
	Health foundation	1
MA182	Calculus II	4
PH161	General Physics I	3
	Behavioral and social sciences distribution	3

Third Semester

CS256	Introduction to Discrete Structures	4
EE244	Digital Logic Design	3
MA282	Differential Equations	3
PH262	General Physics II	4
	Humanities distribution	3

Fourth Semester

CS204	Computer Science II	4
EE204	Basic Circuit Analysis	3
EE206	Fundamental and Digital Circuit Laboratory	2
ES240	Scientific and Engineering Computation	3
	Arts distribution	3
	Behavioral and social sciences distribution	3

Total credit hours 64

*Students may substitute CH 102.

Careers

With technical aspects of the printing industry and with general business knowledge, positions in the printing industry include print production coordinator, desktop publisher, and production manager. Computers allow press operators to perform many of their tasks electronically. With this equipment, they monitor the printing process on a control panel or computer monitor, which allows them to adjust the press electronically. Often, operations work under pressure to meet deadlines.

Salary

According to online career sites, an entry-level print production coordinator with an A.A. and zero to two years experience would earn \$27,600 to \$40,700 annual salary. Additional experience increases earning potential: two to four years, \$29,000 to \$45,000; four to six years, \$31,000 to \$53,000; and six to eight years, \$41,000 to \$54,000.

Earnings for desktop publishers vary according to level of experience, training, location, and size of firm. Median annual earnings were \$31,620 in 2002.

Publication management usually requires a B.A. and seven to ten years' experience. Salary ranges from \$74,000 to \$85,000.

Median hourly earnings of printing machine operators were \$13.95 in 2002.

Job Outlook

Employment of printing machine operators is expected to grow more slowly than the average through 2012. But, the need for workers trained on increasingly computerized printing equipment will create many job openings over the next decade.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) and certificates in computer publishing and printing management. Both the A.A.S. and certificate courses prepare students to work in the printing industry. (*See reverse for computer publishing and printing management curricula.*)

■ Degree

The computer publishing and printing management curriculum is designed to provide students with an understanding of the technical aspects of the printing industry, including desktop publishing, stripping and platemaking, computer applications, offset presses, bindery and finishing, and production management.

■ Certificates

Certificates are offered for electronic imaging prepress and printing technology.

■ Skills Upgrade

Working professionals who want to upgrade skills and seek career advancement in their field may benefit from the certificate or degree curriculum. You may enroll in specific professional/academic courses that will lead to an upgrading of your professional competence.

Contact @ MC

Rockville Campus301-279-7689
www.montgomerycollege.edu

Computer Publishing and Printing Management Curricula

Degrees, Certificates, and Letters of Recognition

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Computer Publishing and Printing Management (R): 343 Printing Management A.A.S.

First Semester

CA161	Desktop Publishing I	3
EN101	Techniques of Reading and Writing	3
	Mathematics foundation	3
PR118	Stripping and Platemaking I	3
PR130	Introduction to QuarkXPress	4

Second Semester

CA100	Keyboarding Fundamentals	1
	English foundation	3
MG101	Principles of Management	3
PR116	Principles of Offset Presses I	3
PR131	Introduction to Photoshop	3
	Arts or humanities distribution	3

Third Semester

MG102	Principles of Supervision	3
PR120	Web Publishing	4
PR212	Planning and Estimating	3
PR281	Printing Internship	3
or		
	PR elective	3
	Natural sciences lab distribution	4

Fourth Semester

	Health foundation	1
PR115	Introduction to Bindery and Finishing	3
PR221	Production Management	3
	Speech foundation	3
	Behavioral and social sciences distribution	3

Total credit hours 63 (64)

(more)

Computer Publishing and Printing Management Curricula

(continued)

Electronic Imaging Prepress Certificate (R): 197

CA100	Keyboarding Fundamentals	1
CA260	Desktop Publishing I	3
PR130	Introduction to QuarkXPress	4
PR131	Introduction to Photoshop	4
PR232	Advanced Photoshop	4
	Professional electives*	3 (4)
Total credit hours		19 (20)

*Select AA 110, AA 121, AA 127, CG 120, PR 117, or PR 118.

Printing Technology Certificate (R): 176

CA100	Keyboarding Fundamentals	1
CA260	Desktop Publishing I	3
PR115	Introduction to Bindery and Finishing	3
PR116	Principles of Offset Presses I	3
PR117	Graphic Arts Photography I*	3
PR118	Stripping and Platemaking I	3
PR212	Planning and Estimating	3
PR216	Principles of Offset Presses II	3
	Program elective†	3 (4)
Total credit hours		25 (26)

*This course is not currently offered; students should contact an adviser for more information.

†Select AA 121, AA 124, AR 103, AR 104, AR 105, CG 120, CG 125, PG 150, PR 221, or PR 281. Department approval is required to apply any elective not on this list to the award of the certificate.

Take the next step.

Complete an Application for Admission form (available online @ www.montgomerycollege.edu/admissions/mcadmin.htm) or call **301-279-5000** for information.

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Careers

Computer scientists research, develop, design, and test computer software, hardware, and systems for scientific and technical applications. Computer software engineers design and develop the software systems that control computers; computer hardware engineers work with circuit boards, computer chips, keyboards, modems, and scanners. Computer operators oversee the operation of computer hardware systems, and must be able to solve problems that occur during operations.

A computer science student who goes on to finish a four-year degree is generally qualified for a well-paying profession in the technical data processing field.

Salary

Median annual earnings of computer operators were \$29,650 in 2002. Entry-level positions for candidates with an A.A. include computer operator and PC maintenance technician with salary ranges from \$28,250 to \$38,500 in 2003.

According to the National Association of Colleges and Employers, starting salary offers for graduates with a bachelor's degree in computer science averaged \$47,109; starting salaries for software engineers in software development ranged from \$64,250 to \$97,000 in 2003.

Job Outlook

Employment of computer hardware and software engineers is projected to increase, due to demand for computer consultants for businesses that need help managing, upgrading, and customizing increasingly complex systems through 2012.

Education & Training Options

(See reverse for computer science and technologies curricula.)

■ Degree

Montgomery College offers an associate of applied science degree (A.A.), certificate programs, and a letter of recognition in computer science. The program is designed for students who plan to transfer to a four-year degree program in computer science or for students in mathematics, science, or technical areas who wish to acquire skills in computer software development.

■ Certificate

Certificate programs are offered in computer programming; Oracle developer; Java developer; object-oriented software development; and Web programming (in conjunction with the Computer Applications and Visual Technologies Departments. See Web Careers in *Montgomery College Catalog* for details). A letter of recognition is offered in Oracle database fundamentals.

■ Workforce Training

Students who want to enter the workforce instead of pursuing a degree should follow the College curricula or consider one of the certificates offered by the department. These curricula and certificates were developed in conjunction with local professionals. Most employers, however, expect an employee in the computer science or information systems fields to have at least a bachelor's degree.

■ Skills Upgrade

If you currently have a degree in computer science and want to upgrade skills, review the upper-level computer science and technology courses in the *Montgomery College Catalog* under "Course Descriptions."

Contact @ MC

Rockville Campus301-279-5184
www.montgomerycollege.edu

Computer Science and Technologies Curricula

Degrees, Certificates, and Letters of Recognition

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Computer Science (R): 107 Computer Science and Technologies A.A.

General Education and Other Requirements (33 credit hours)

	English foundation	3
	Health foundation	1
MA181	Calculus I	4
	Speech foundation	3
	Arts distribution	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	6
	Humanities distribution	3
	Natural sciences distribution	7

Computer Science Fundamental Requirements (16 credit hours)

CS103	Computer Science I	4
CS204	Computer Science II	4
CS256	Introduction to Discrete Structures	4
MA182	Calculus II	4

Computer Science Electives (11 credit hours)

Select from the following courses:		
CS136	Systems Analysis and Design	3
CS140	Introduction to Programming	3
CS200	Microcomputer Assembly Language Programming	3
CS210	Computer Security	3
CS216	UNIX/LINUX Operating System	3
CS226	Introduction to Object-Oriented Programming with C++	3
CS249	Advanced Object-Oriented Programming with C++	3
CS258	Algorithms	3
CS269	Computer Science and Technologies Internship	1-4
MA284	Linear Algebra	4

Students should consult an adviser regarding requirements at transfer institutions.

Total credit hours 60

(more)

Computer Science and Technologies Curricula

(continued)

Information Systems: 109 Computer Science and Technologies A.A.

General Education and Other Requirements (49–52 credit hours)

AC201	Principles of Accounting I	4
AC202	Principles of Accounting II	4
EC201	Principles of Economics I	3
EC202	Principles of Economics II*	3
EN101	Techniques of Reading and Writing	3
	English foundation	3
	Health foundation	1 (3)
	Mathematics foundation	3 (4)
	Speech foundation	3
	Arts distribution	3
	Arts or humanities distribution†	3
	Behavioral and social sciences distribution	6
	Humanities distribution†	3
	Natural sciences distribution	7

Specialized Requirements (15 [17] credit hours)

CS103	Computer Science I or	
CS2xx	Intermediate Programming Language‡	3 (4)
CS110	Computer Concepts or	
	CS elective	3 (4)
CS136	Systems Analysis and Design	3
CS140	Introduction to Programming	3
BA210	Statistics for Business Administration* or	
MA116	Elements of Statistics**	3

Total credit hours 64(69)

*If this course is not required by a specific transfer institution, substitute a CS course in advanced programming or another CS course.

†A specific transfer institution may recommend a foreign language.

‡Choose CS 103, CS 213 (Java), CS 215 (Visual Basic), CS 225 (C), or CS 226 (C++) as appropriate for a specific transfer institution.

**If this course is not required by a specific transfer institution, substitute MA 181 (or higher) or a CS course in advanced programming or another CS course.

Computer Programming Certificate: 108

CS110	Computer Concepts *	3
CS140	Introduction to Programming	3
	Intermediate languages†	6 (7)
	Advanced language‡	3 (4)
	CS elective or department- approved CA elective	3
Total credit hours		18 (20)

*May be replaced by another CS course with department consent.

†Select two courses from CS 103, CS 213, CS 215, CS 225, CS 226, or other department-approved language.

‡The advanced language must correspond to one of the intermediate languages chosen.

Java Developer Certificate: 221

CS140	Introduction to Programming	3
CS213	Java Programming Language	3
CS214	Advanced Java Programming or	
CS246	Data Structures Using Java	3
CS220	Client-Server Programming with Java	3
	Department-approved CS electives	6
Total credit hours		18

(more)

Computer Science and Technologies Curricula

(continued)

Object-Oriented Software Development Certificate: 222

CS136	Systems Analysis and Design	3
CS140	Introduction to Programming	3

Select one of the following combinations:

CS 103	Computer Science I and	
CS 204	Computer Science II	
CS 213	Java Programming Language and	
CS 246	Data Structures Using Java	
	or	
CS 226	Introduction to Object-Oriented	
	Programming with C++ and	
CS 249	Advanced Object-Oriented	
	Programming with C++	6–8

Electives:

Select two of the following:

CS 214, CS 215, CS 218, CS 220, CS 234, CS 251, or another department- approved CS course	6
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Total credit hours 18–20

Oracle Developer Certificate: 223

CS140	Introduction to Programming	3
CS213	Java Programming Language	
	or	
CS215	Visual Basic Programming	3
CS270	Introduction to Oracle	3
CS271	Oracle Programming	3
CS272	Oracle Forms and Reports	3
CS276	Advanced Oracle Programming	
	Using Java or Visual Basic	3
CS278	Oracle Developer	3

Total credit hours 21

Oracle Database Fundamentals Letter of Recognition: 806

CS270	Introduction to Oracle	3
CS271	Oracle Programming	3
CS272	Oracle Forms and Reports	3

Total credit hours 9

Careers

Criminal justice professionals work in local, state, federal, or private agencies. Criminal justice social workers make recommendations to courts, prepare presentencing assessments, and provide services to prison inmates, parolees, probationers, and their families. They are also employed as probation officers and correctional treatment specialists.

Law enforcement officers (criminal investigators, police, and detectives) maintain law and order, collect evidence and information, and conduct investigations and surveillance.

Workers in related occupations include correctional officers, private detectives and investigators, security guards, and gaming surveillance officers.

Salary

Students with two-year criminal justice degrees qualify for most entry-level positions (security officers, law enforcement officers, correctional officers) with starting salaries of \$24,000 to \$31,000. Median annual earnings of correctional officers and jailers were \$32,670 in 2002. According to the Federal Bureau of Prisons, the starting annual salary for federal correctional officers was about \$23,000 in 2003. First-line supervisors/managers of correctional officers were \$44,940 in 2002. Probation officers and correctional treatment specialists earned an average annual salary of \$38,360 in 2002. Child, family, and school social workers' median annual earnings were \$33,150 in 2002; police and patrol officers were \$42,270 in 2002; supervisors were \$61,010 in 2002; detectives and criminal investigators were \$51,410 in 2002.

Total earnings can vary with payments for overtime, usually significantly. Online career sites show police patrol officer positions with

one year of experience and an associate's degree in salary ranges from \$34,800 to \$49,000. Detective positions with an associate's degree and two to four years experience show offers of \$28,000 to \$42,000 annual salary. FBI special agent positions are listed with salaries in the \$34,000 to \$35,000 range.

Job Outlook

At the local and state levels, growth is likely to continue as long as crime remains a serious concern. A more security-conscious society and concern about drug-related crimes and acts of terrorism should contribute to the increasing demand for police and security services. The level of government spending determines the level of employment for police officers, detectives and special agents, causing job opportunities to vary from year to year.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in criminal justice. (*See reverse for criminal justice curriculum.*)

■ Degree

A strong academic core forms the basis of the program, and, combined with specialized career courses, offers the graduate the alternatives of entering the field or continuing in an institution of higher learning.

■ Workforce Training

The A.A.S. curriculum prepares students for employment in the criminal justice profession.

Contact @ MC

Rockville Campus301-251-7477
www.montgomerycollege.edu/Departments/crprgm/CJSources.htm

Criminal Justice Curriculum

Degrees, Certificates, and Letters of Recognition

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Criminal Justice A.A.S. (R): 314

First Semester

CJ110	Administration of Justice	3
EN101	Techniques of Reading and Writing	3
	Health foundation	1 (3)
	Mathematics foundation	3
SO101	Introduction to Sociology	3
	Arts or humanities distribution	3

Second Semester

CJ111	Introduction to Law Enforcement or Introduction to Corrections	3
CJ230	Criminal Law	3
CJ221	English foundation	3
PS101	American Government	3
PY102	General Psychology	3

Third Semester

CJ215	Organization and Administration	3
	CJ electives	6
	Speech foundation	3
	Natural sciences lab distribution	4

Fourth Semester

	CA or CS elective	3
CJ242	Theory and Practice	3
CJ244	Contemporary Issues	3
	CJ or SS elective	3
	Behavioral and social sciences distribution	3

Total credit hours 62 (64)

Careers

Diagnostic medical sonographers, also known as “ultrasonographers,” are qualified by academic and clinical training to operate sophisticated equipment to help physicians and other health practitioners diagnose and treat patients.

Diagnostic medical sonographers keep patient records, and adjust and maintain equipment. They may also prepare work schedules, evaluate equipment purchases, or manage a sonography or diagnostic imaging department. They may specialize in obstetric and gynecologic sonography (the female reproductive system), abdominal sonography (the liver, kidneys, gallbladder, spleen, and pancreas), neurosonography (the brain), or ophthalmologic sonography (the eyes).

Salary

Median annual earnings of diagnostic medical sonographers were \$48,660 in 2002 (\$47,530 in hospitals, \$50,390 in physician’s offices). According to online career sites, a sonographer with a minimum of two years’ experience and completion of a two to four-year accredited program can earn from \$45,500 to \$53,000.

Job Outlook

Continuous advances in ultrasound and expansion of hospitals and health services create constant demand for skilled, qualified sonographers. Career rewards include opportunities for diversity and advancement.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in diagnostic medical sonography. The program is accredited by the Commission on Accreditation of Allied Health Education Programs. (See reverse for diagnostic medical sonography curriculum.)

With an A.A.S. or certificate, students are eligible to apply to the American Registry of Diagnostic Medical Sonographers to sit for their national exams.

■ Degree

The A.A.S. curriculum requires a minimum of two years of classroom instruction and clinical experience. At the end of the first year, students choose to specialize in one or more of the following tracks:

- general sonography
- echocardiography
- vascular

Upon completion of the A.A.S. curriculum, the graduate will be eligible to sit for the national registry exam.

■ Certificate

The certificate program is designed for health care professionals. Credits earned in this curriculum may be applied toward the associate’s degree.

■ Skills Upgrade

Health care professionals, such as obstetric nurses and radiologic technologists, can increase their marketability by cross-training in sonography.

Contact @ MC

Takoma Park Campus301-562-5569
or Admissions Office301-650-1501
www.montgomerycollege.edu/dms

Diagnostic Medical Sonography Curricula

Degrees, Certificates, and Letters of Recognition

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Diagnostic Medical Sonography A.A.S. (TP)

General Education and Other Requirements (33 credit hours)

BI204	Human Anatomy and Physiology I*	4
BI205	Human Anatomy and Physiology II	4
EN101	Techniques of Reading and Writing	3
EN102	Techniques of Reading and Writing or	
EN109	Writing for Technology and Business	3
HI125	Medical Terminology I	2
HI126	Medical Terminology II	2
HI135	Concepts of Disease	3
	Mathematics foundation	3
PY102	General Psychology	3
SP108	Fundamentals of Speech	3
	Arts or humanities distribution	3

Diagnostic Medical Sonography Fundamental Requirements (25 credit hours)

MS101	Orientation to Diagnostic Medical Sonography	3
MS102	Acoustical Physics and Instrumentation	2
MS201	Introduction to Sectional Anatomy	3
MS202	Acoustical Physics and Instrumentation II	2
MS214	Special Topics in Ultrasound	3
MS220	Sonography Practicum	1
MS221	Sonography Practicum I	2
MS222	Sonography Practicum II	4
MS223	Sonography Practicum III	4
MS224	Seminar—Diagnostic Medical Sonography	1

(more)

Diagnostic Medical Sonography Curricula

(continued)

Diagnostic Medical Sonography

General Sonography Track (12 credit hours)

MS112	Abdominal Sonography	3
MS113	Obstetrics/Gynecology Sonography	3
MS212	Abdominal Sonography II	3
MS213	Obstetrics/Gynecology Sonography II	3

**Total credit hours for
general sonography track 70**

Echocardiography Track (6 credit hours)

MS215	Diagnostic Medical Sonography: Echocardiography	3
MS218	Echocardiography II	3

**Total credit hours for
echocardiography track 64**

Vascular Track (6 credit hours)

MS216	Diagnostic Medical Sonography: Vascular Sonography	3
MS219	Vascular Sonography II	3

**Total credit hours for
vascular track 64**

*Students should check the prerequisite for BI 204.

Diagnostic Medical Sonography Certificate (TP): 151

Diagnostic Medical Sonography Fundamental Requirements (25 credit hours)

EN101	Techniques of Reading and Writing	3
MS102	Acoustical Physics and Instrumentation	2
MS201	Introduction to Sectional Anatomy	3
MS202	Acoustical Physics and Instrumentation II	2
MS214	Special Topics in Ultrasound	3
MS220	Sonography Practicum	1
MS221	Sonography Practicum I	2
MS222	Sonography Practicum II	4
MS223	Sonography Practicum III	4
MS224	Seminar—Diagnostic Medical Sonography	1

General Sonography Track (12 credit hours)

MS112	Abdominal Sonography	3
MS113	Obstetrics/Gynecology Sonography	3
MS212	Abdominal Sonography II	3
MS213	Obstetrics/Gynecology Sonography II	3

**Total credit hours for general
sonography track 37**

Echocardiography Track (6 credit hours)

MS215	Diagnostic Medical Sonography: Echocardiography	3
MS218	Echocardiography II	3

**Total credit hours for
echocardiography track 31**

Vascular Track (6 credit hours)

MS216	Diagnostic Medical Sonography: Vascular Sonography	3
MS219	Vascular Sonography II	3

**Total credit hours for
vascular track 31**

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Careers

Childcare workers nurture and teach children of all ages in child care centers, nursery schools, preschools, public schools, private households, family childcare homes, and before- and after-school programs. School-related employment opportunities include instructional aides, child care center directors, head teacher, and assistant teacher positions within early childhood, child care, nursery schools, and recreational programs.

Salary

Earnings of self-employed childcare workers vary depending on the hours worked, the number and ages of the children, and the location. Median annual earnings of teacher assistants in 2002 were \$18,660. In 2002, child care workers nationally earned an average hourly wage of \$7.86 (U.S. Dept. of Labor, Bureau of Labor). According to online career sites, child day care workers with two to four years' experience may earn from \$15,800 to \$23,800 annually. In Maryland, child care center program administrators earn an average annual salary of \$27,000 (national average, \$37,400; www.payscale.com).

Job Outlook

Both center-based programs and family child care provider positions are expected to grow about as fast as the average through 2012.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in early childhood education, a certificate program in early childhood education, and an associate of arts in teaching (A.A.T.). (See reverse for *education curricula*.)

Education students may choose from various program options, including early childhood, elementary, secondary, and special education tracks.

■ Degree

The A.A.S. or a program certificate prepares students to work with children from infancy through age eight in a childcare setting.

The associate of arts in teaching (A.A.T.) curriculum prepares students to transfer to a four-year college or university in the state of Maryland to pursue a bachelor's degree and teacher certification. The A.A.T. has been articulated with all the transfer programs in elementary education in the state of Maryland.

■ Certificate

The early childhood education certificate curriculum prepares students to work with children from infancy through age eight in a variety of child and family day care settings. It includes a semester of supervised practicum experience in an approved placement and 12 semester hours in academic courses.

■ Workforce Training

The College's Workforce Development & Continuing Education offers courses for child care providers to obtain and/or renew a Family Child Care license and professional certifications.

For information, call 301-279-5188 or visit www.montgomerycollege.edu/wdce.

Contact @ MC

Rockville Campus301-738-1757
www.montgomerycollege.edu

Education Curricula

Degrees, Certificates, and Letters of Recognition

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Early Childhood Education Technology A.A.S. (R): 315

First Semester

ED120	Child Growth and Development	3
EN101	Techniques of Reading and Writing	3
GE101	Introduction to Geography	3
HE100	Principles of Healthier Living	1
PY102	General Psychology	3
SP108	Introduction to Human Communication	3

Second Semester

ED121	Planning Curricula for Child Care	3
ED122	Child Care Practicum and Workshop	3
ED123	Infant and Toddler Development and Curriculum Planning	3
	English foundation	3
SO101	Introduction to Sociology	3

Third Semester

ED213	Social Development in Young Children	3
	Curriculum seminar*	2
	Mathematics foundation	3
	Arts distribution	3
	History (select from humanities distribution)	3

Fourth Semester

ED130	First Start: Care of Infants and Toddlers with Disabilities	3
ED215	Planning and Administering Child Care Programs	3
	Curriculum seminar*	2
	Natural sciences lab distribution	4
	Electives†	5 (6)

Total credit hours 62 (63)*

Select ED 210, ED 211, or ED 212.

†Select two electives from AR 123, BA 101, ED 200, FM 103, HE 107, MU 119, PY 215, and SO 204.

(more)

Education Curricula

(continued)

Teacher Education Transfer Program A.A.T.: 601

First Semester*

BI101	General Biology	4
ED101	Foundations of Education	3
ED102	Field Experience in Education	1
EN101	Techniques of Reading and Writing	3
HS201	History of the United States	3
MA130	Elements of Mathematics I	4

Second Semester

ED140	Introduction to Special Education	3
ED141	Field Experience in Special Education	1
EN102	Techniques of Reading and Writing	3
HS202	History of the United States	3
MA131	Elements of Mathematics II	4
PC101	Physical Science I	4

Third Semester

ED216	Processes and Acquisition of Reading	3
IS273	Integrated Arts	3
MA132	Elements of Mathematics III	4
PC102	Physical Science II	4
PY102	General Psychology	3
	PRAXIS I EXAM	

Fourth Semester

AN101	Introduction to Social and Cultural Anthropology	3
GE110	Global Geography	3
HE101	Personal and Community Health	3
PY227	Educational Psychology	3
SP108	Introduction to Human Communication	3

Total credit hours 68

*Students must demonstrate proof of computer literacy by either taking CA 120 or testing out of that requirement.

Early Childhood Education Certificate (R): 177

Required Courses

ED120	Child Development for Child Care Workers	3
ED121	Planning Curricula for Child Care	3
ED122	Child Care Practicum and Workshop	3
EN101	Techniques of Reading and Writing	3
PY102	General Psychology	3
PY215	Child Psychology*	3
SO101	Introduction to Sociology	3

Students will select one of the following courses:

AR123	Crafts	3
ED200	Children's Literature	3
MU119	Music Fundamentals for Classroom Teachers	3
PE200	Fundamentals of Elementary School Physical Education	3

Students will select one of the following courses:

FM103	Introduction to Nutrition	3
HE107	First Aid and Safety in the Home, School, and Community	2

Students will select one free elective† 3

Total credit hours 29 (30)

*This course has a prerequisite.

†Select BA 101, ED 123, EN 102, FM 103, HE 107, SO 104, or SO 204.

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Careers

Electrical engineers design, develop, test, and supervise the manufacture of electronic equipment, such as electric motors, machinery controls, lighting, and wiring in buildings, automobiles, aircraft, radar, and navigation systems, and broadcast and communications systems.

Electrical engineers are employed in engineering and business consulting firms, government agencies, and manufacturers of electrical and electronic/computer equipment, office equipment, industrial machinery, and professional and scientific instruments.

Salary

Median annual earnings of electrical engineers were \$68,180 in 2002. According to a 2003 salary survey by the National Association of Colleges and Employers, starting annual salaries for job candidates with a bachelor's degree in computer engineering averaged \$49,794.

Job Outlook

Electrical engineering occupations are projected to grow more slowly than the average through 2012. Employment will continue to be driven by an increasing demand for electrical and electronic goods, including communications equipment, defense-related equipment, and consumer electronics.

Education & Training Options

Montgomery College offers an electrical engineering track in its engineering science A.S. curriculum. (See reverse for *electrical engineering curriculum*.)

By far the largest option in overall enrollment, electrical engineering offers the largest diversity of sub-specialties, ranging from the microscopic devices connected with modern communications and computer design, to the gigantic components associated with power production and transmission. Many bioengineering fields also encompass the application of electrical engineering principles.

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in electrical engineering to:

- University of Maryland College Park—follow the curriculum as published in the *Montgomery College Catalog*.
- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

■ Faculty

Four full-time faculty serve as engineering advisers. All hold advanced degrees in either physics or engineering and have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas. They share the classroom duties with a group of part-time faculty, who add their own special expertise on the world beyond academia.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu/departments/phengrv/engineering.htm

Electrical Engineering Curriculum

Degrees, Certificates, and Letters of Recognition

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Electrical Engineering: 402 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers*	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

EE114	Programming Concepts for Engineering	4
EE244	Digital Logic Design	3
MA182	Calculus II	4
PH161	General Physics I	3
	Behavioral and social sciences distribution	3

Third Semester

ES240	Scientific and Engineering Computation	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Arts distribution	3
	Humanities distribution	3

Fourth Semester

EE204	Basic Circuit Analysis	3
EE206	Fundamental and Digital Circuit Laboratory	2
MA282	Differential Equations	3
PH263	General Physics III	4
	Behavioral and social sciences distribution	3

Total credit hours 64

*Students may substitute CH 102.

Careers

Fire is a significant problem. Each year in the U.S. more than 18,000 people are injured and 3,000 people die as a result of fire. In addition to personal losses, more than \$10 billion in property damage occurred in 2002 as a result of fire. Fire protection engineering is a unique profession that uses science and technology to make our world safe from fire, and builds upon the basic tools of other engineering disciplines including:

- Mechanical engineering
- Electrical engineering
- Chemical engineering
- Civil engineering

Fire protection engineers (FPEs) design ways to protect people from fire. FPEs:

- Design building features
- Analyze activities in buildings
- Research materials/ products

A fire protection engineer may be the person responsible for determining what the fire hazards are in a proposed new or existing facility, and researching and designing fire protection systems such as alarms and sprinklers. They also might oversee the installation, maintenance and operations of these systems and may be responsible for their approval by government or other agencies responsible for ensuring a safe environment for people, data and property.

For more information on fire protection engineering, visit the Fire Protection Engineering Web site at www.careersinfireprotectionengineering.com. This Web site is sponsored by the Society of Fire Protection Engineers.

Salary

According to a 2003 study conducted by the Society of Fire Protection Engineers of its membership, more than 50 percent of all the respondents made \$60,000 or more. More than 25 percent of the respondents made \$100,000 or more.

Education & Training Options

Montgomery College offers a fire protection engineering track in its engineering science A.S. curriculum. (See reverse for fire protection curriculum.)

Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering. All have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, including several veterans of many years at the College, who add their own special expertise on the world beyond academia.

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in biological resources engineering to:

University of Maryland College Park—follow the curriculum as published in the Montgomery College Catalog.

Johns Hopkins University—follow the general engineering track.

Another engineering school—consult with a Montgomery College adviser.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Fire Protection Engineering Curriculum

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Fire Protection Engineering: 403 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers*	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Behavioral and social sciences distribution	3
	Humanities distribution	3

Third Semester

ES220	Mechanics of Materials	3
ES221	Dynamics	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Behavioral and social sciences distribution	3

Fourth Semester

ES232	Thermodynamics	
	or	
ES240	Scientific and Engineering Computation	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Arts distribution	3

Total credit hours 61

*Students may substitute CH 102.

Careers

Fire-rescue workers help protect the public against fire and other emergencies. They perform a variety of nonemergency and emergency fire-rescue and safety-related tasks, usually for federal, state, and local fire-rescue agencies. At the local level, they may be career or volunteer. Between alarms, firefighters clean and maintain equipment, conduct practice drills and fire inspections, and participate in physical fitness activities.

Some firefighters become fire investigators, who determine the origin and causes of fires. They collect evidence, interview witnesses, and prepare reports on fires in cases where arson or criminal negligence may be the cause.

Salary

In 2002, firefighters' median hourly earnings were \$17.42 (\$17.92 in local government; \$15.96 in the federal government; and \$13.58 in state government), while supervisors/managers of firefighting and prevention workers were \$55,450. Fire inspectors/investigators' median annual earnings were \$44,250 in 2002 (\$46,820 in local government).

In Prince George's County, Maryland, starting salary offered in 2001, was \$33,700; Montgomery County (and most surrounding counties) offered a starting salary of \$28,000.

Firefighters who average more than a certain number of hours a week are required to be paid overtime, and they receive benefits usually including medical and liability. Layoffs are uncommon.

Job Outlook

Employment of firefighters is expected to remain stable, with prospective firefighters facing competition for jobs. Usually a high school education is enough to enter the field, and a pension is guaranteed upon retirement after 25 years of service.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.), a certificate program, and a letter of recognition in fire science fire service management. The program is designed for both the career and volunteer firefighter, and all uniformed fire service personnel preparing for rank promotions. (See *Fire Science Fire Service Management curricula*.)

■ Degree

This curriculum is designed to provide students with current tactics used by fire officers for suppression of fires and current theories of personnel management and leadership.

■ Certificate

As part of a statewide program, a fire and arson investigation certificate curriculum is offered, compatible with industry standards. Upon completion, students may continue working towards the A.A.S. in either fire science fire service management or criminal justice.

■ Letter of Recommendation

This three-level sequence covers the minimum level of certification for ambulance personnel, a prerequisite for admission into paramedic curriculum. Upon completion, students are eligible to take the Maryland and DOT EMT-Basic National Standard Certification Test.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Fire Science Fire Service Management Curricula

Degrees, Certificates, and Letters of Recognition

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Fire Science Fire Service Management A.A.S. (R): 346 Statewide Program

General Education and Other Requirements (30 credit hours)

EN101	Techniques of Reading and Writing	3
EN102	Techniques of Reading and Writing	
	or	
EN109	Writing for Technology and Business	3
	Health foundation	1
	Mathematics foundation	3
MG205	Organizational Behavior	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

General electives: These electives should be in the areas of accounting, computer applications, computer science, or stress management. 4

Fire Science Requirements (18 credit hours)

FS101	Fire Protection Organization	3
FS104	Fire Service Administration	3
FS105	Fundamentals of Fire Suppression	3
FS106	Introduction to Occupational Safety, Health, and Loss Control in Emergency Services	
	or	
FS107	Community Fire Safety and Injury Prevention Education	3
FS112	Building Codes and Construction	3
FS201	Fire Prevention and Inspection	3

Fire Science Electives (select 12 credit hours)

FS106	Introduction to Occupational Safety, Health, and Loss Control in Emergency Services	
	or	
FS107	Community Fire Safety and Injury Prevention Education*	3
FS214	Advanced Fire Tactics and Strategy	3
FS225	Fire and Arson Investigation	3
FS226	Advanced Fire and Explosive Investigation	3
FS250	Fire Protection Internship	3

Total credit hours 60

*Students may not repeat the FS course selected to meet the Fire Science Requirements.

(more)

Fire Science Fire Service Management Curricula

(continued)

Fire and Arson Investigation Certificate (R): 180 Statewide Program

CJ110	Administration of Justice	3
CJ211	Criminal Investigation	3
CJ222	Criminal Evidence	3
CJ232	Criminal Forensics	3
EN101	Techniques of Reading and Writing	3
EN102	Techniques of Reading and Writing or	
EN109	Writing for Technology and Business	3
FS112	Building Codes and Construction	3
FS225	Fire and Arson Investigation	3
FS250	Fire Protection Internship	3
PY102	General Psychology	3
PY213	Criminal and Legal Psychology or	
PY221	Introduction to Abnormal Psychology	3
Total credit hours		33

Emergency Medical Technician— Basic Letter of Recognition: 811

FS151	Emergency Medical Technician— Basic I*	4
FS152	Emergency Medical Technician— Basic II*	3
FS153	Practicum: Emergency Medical Technician—Basic	1
Total credit hours		8

*The student must maintain a 70 percent average and can score no lower than 60 percent on any assessment. Failure to maintain a 70 percent average will result in the student being dropped from the course.

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Careers

Tracks in health enhancement, exercise science, and physical education are designed for students interested in adult fitness, personal training, worksite wellness, cardiac rehabilitation, health promotion, community health, teaching health or physical education on the elementary or secondary level, and athletic coaching. Career possibilities in physical education and health have expanded beyond the traditional school setting during the past decade. Americans have grown more interested in personal health, fitness, wellness, and leisure-time physical activities. This has created a demand for professionals with specialized training to provide leadership and service in adult fitness and health promotion.

Salary

Median hourly earnings of fitness trainers and aerobics instructors in 2002 were \$11.51. The middle 50 percent earned between \$8.06 and \$18.18, while the top 10 percent earned \$26.22 or more. Median annual earnings of kindergarten, elementary, middle, and secondary school (health and P.E.) teachers ranged from \$39,810 to \$44,340 in 2002. Median annual earnings of health educators were \$38,450 in 2002. The middle 50 percent earned between \$31,070 and \$45,950 a year. Median annual earnings of social and human service assistants were \$23,370 in 2002. Median annual earnings of coaches were \$27,880 in 2002.

Job Outlook

Overall employment of recreation and fitness workers is expected to grow faster than the average for all occupations through 2012, as increasing numbers of people spend more time and money on leisure and fitness services. Jobs for coaches and related workers are expected to increase about as fast as the average through 2012. Employment will grow as the

public continues to increasingly participate in sports as a form of entertainment, recreation, and physical conditioning. Job opportunities for teachers over the next 10 years should be excellent, attributable mostly to the large number of teachers expected to retire. Employment of health educators is expected to grow for all occupations through 2012 as a result of increasing emphasis on disease prevention through improved dietary habits. Job opportunities for social and human service assistants are expected to be excellent, particularly for applicants with appropriate postsecondary education. The number of social and human service assistants (gerontology) is projected to grow much faster than the average for all occupations between 2002 and 2012—ranking among the most rapidly growing occupations.

Education & Training Options

Montgomery College offers an associate of arts degree (A.A.) in four different tracks including exercise science/health fitness leadership; gerontology; health education; and physical education teacher preparation/ coaching. The College offers a certificate program in personal training.

■ Degree

Each curriculum track provides the first two years of a typical four-year curriculum leading to a baccalaureate degree. Most career opportunities in the fields related to these curricula

■ Certificate

The personal training certificate curriculum has been designed to develop innovative fitness specialists who are knowledgeable and skilled in one-to-one fitness and wellness instruction.

Contact @ MC

Rockville Campus301-279-5218
www.montgomerycollege.edu

Health Enhancement, Exercise Science, and Physical Education Curricula

Degrees, Certificates, and Letters of Recognition

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Exercise Science/Health Fitness Leadership (R): 157 Arts and Sciences A.A.

First Semester

BI107	Principles of Biology I	4
EN101	Techniques of Reading and Writing*	3
HE101–202	Health elective	
	or	
PE213–238	Physical education major skills and theory	
	or	
	Selected 100-level PE courses†	1 (3)
HS118	History of Sport in America	3
PE202	Principles and Practices of Fitness and Wellness	2
PE203	Overview of Physical Education	3
Second Semester		
EN102	Techniques of Reading and Writing	3
HE105	First Aid and Basic Life Support	3
HE108	Nutrition for Fitness and Wellness	3
	Mathematics foundation	3
PE230	Weight Training: Theory and Application	2
	Speech foundation	3

Third Semester

BI204	Human Anatomy and Physiology I	4
PE213–238	Physical education major skills and theory	
	or	
PE231	Topical Investigations—Practical Applications in Health Fitness Technology I	
	or	
	Selected 100-level PE courses†	1
PE235	Fundamentals of Athletic Training	3
	Arts distribution	3
	Behavioral and social sciences distribution‡	3
	Arts or humanities distribution	3

(more)

Health Enhancement, Exercise Science, and Physical Education Curricula

(continued)

Exercise Science/Health Fitness Leadership (R): 157 (continued)	
Fourth Semester	
BI205	Human Anatomy and Physiology II 4
PE213–238	Physical education major skills and theory
or	
PE232	Topical Investigations—Practical Applications in Health Fitness Technology II
or	
	Selected 100-level PE courses† 1
PE237	Fitness Assessment and Exercise Program Designs 3
SO212	Sport in American Society 3
	Arts or humanities distribution 3
Total credit hours 61 (63)	
*Students who qualify for a waiver of EN 101 may select three credits of electives with approval of the department.	
†Students must consult with departmental adviser before selecting electives from HE, PE, or other categories. Selected 100-level PE courses include PE 129–138 aquatics elective, PE 174, or other 100-level PE courses with permission of the department.	
‡The two behavioral and social sciences courses must be in different disciplines.	

Gerontology (R): 600 Arts and Sciences A.A.	
First Semester	
BI107	Principles of Biology I 4
HE101	Personal and Community Health 3
HE130	Introduction to Gerontology 3
PY102	General Psychology 3
SO101	Introduction to Sociology 3
Second Semester	
EN102	Techniques of Reading and Writing 3
CH101	Principles of Chemistry I (suggested) or
CH109A/B	Chemistry and Society Laboratory 4
HE200	Introduction to Health Behaviors 3
	Mathematics foundation 3
SO210	Aging in America 3
Third Semester	
BI204	Human Anatomy and Physiology I 4
HE105	First Aid and Basic Life Support 3
HE230	Health in the Later Years 3
	Arts distribution 3
	Humanities distribution 3
Fourth Semester	
BI205	Human Anatomy and Physiology II 4
PE240	Instructional Exercise Techniques for Older Adults 3
	Speech foundation 3
	Arts or humanities distribution 3
Total credit hours 61	

(more)

Health Enhancement, Exercise Science, and Physical Education Curricula

(continued)

Health Education (R): 186 Arts and Sciences A.A.

First Semester

BI101	General Biology or	
BI107	Principles of Biology I	4
EN101	Techniques of Reading and Writing*	3
HE101	Personal and Community Health	3
HE120	The Science and Theory of Health	3
PY102	General Psychology	3

Second Semester

CH101	Principles of Chemistry I or	
CH109A/B	Chemistry and Society/Chemistry and Society Laboratory†	4
EN102	Techniques of Reading and Writing	3
HE200	Introduction to Health Behaviors	3
	Mathematics foundation	3
SO101	Introduction to Sociology	3

Third Semester

BI204	Human Anatomy and Physiology I	4
PE182	Lifetime Fitness and Wellness or	
	Health electives‡	5 (6)
	Arts distribution	3
	Humanities distribution	3

Fourth Semester

BI205	Human Anatomy and Physiology II	4
	Speech foundation	3
	Arts or humanities distribution	3
	Health electives‡	3
Total credit hours		60 (61)

*Students who qualify for a waiver of EN 101 may select three credits of electives with approval of the department.

†If CH 109 is selected, both CH 109A and CH 109B must be taken.

‡Students must consult with departmental adviser before selecting electives from HE or other categories. Select health electives from HE 105, HE 107, HE 108, HE 111, HE 202, and HE 204.

Personal Training Certificate (R): 191

HE105	First Aid and Basic Life Support	3
HE108	Nutrition for Fitness and Wellness Health or physical education elective(s)*	3
PE202	Principles and Practices of Fitness and Wellness	2
PE230	Weight Training: Theory and Application/P.E. Majors	2
PE237	Fitness Assessment and Exercise Program Designs	3
PE238	Personal Training Techniques	3

Total credit hours 19

*Select from PE 135, PE 174, PE 183, PE 185, PE 186, PE 187, PE 188, PE 226, PE 231, PE 232, PE 233, PE 234, and/or HE 101–204.

(more)

Health Enhancement, Exercise Science, and Physical Education Curricula

(continued)

Physical Education Teacher Preparation/ Coaching (R): 159 Arts and Sciences A.A.

First Semester

BI107	Principles of Biology I	4
EN101	Techniques of Reading and Writing*	3
HE105	First Aid and Basic Life Support	3
PE202	Principles and Practices of Fitness and Wellness	2
PE203	Overview of Physical Education	3
PE213–238	Physical education major skills and theory	2

Second Semester

EN102	Techniques of Reading and Writing	3
HE101	Personal and Community Health Mathematics foundation	3
PE213–238	Physical education major skills and theory†	2
	Speech foundation	3

Third Semester

BI204	Human Anatomy and Physiology I	4
HE108–202	Health electives†	
	or	
PE200	Foundations of Elementary School Physical Education	
	or	
PE213–238	Physical education major skills and theory†	5 (6)
HS118	History of Sport in America Behavioral and social sciences distribution‡	3

Physical Education Teacher Preparation/ Coaching (R): 159 Arts and Sciences A.A. (continued)

Fourth Semester

BI205	Human Anatomy and Physiology II	4
PE213–238	Physical education major skills and theory	
	or	
	Selected 100-level PE courses†	2
SO212	Sport in American Society	3
	Arts distribution	3
	Arts or humanities distribution	3

Total credit hours 61 (62)

*Students who qualify for a waiver of EN 101 may select three credits of electives with approval of the departmental adviser.

†Students must consult with departmental adviser before selecting electives from HE, PE, or other categories. With departmental permission, two credits of selected 100-level PE courses may be substituted for PE 213–238 major skills courses. Recommended selections include PE 129–138 aquatics elective and PE 174.

‡The two behavioral and social sciences courses must be in different disciplines.

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Careers

Health information technicians work in health record services located in hospitals, nursing homes, ambulatory care facilities, physician offices, insurance offices, government agencies, and other facilities utilizing health records. They have little or no contact with patients.

Technicians use computer programs to tabulate and analyze data to help improve patient care, control costs, for use in legal actions, in response to surveys, or for use in research studies.

Salary

Experienced health information technicians earn an average salary exceeding \$33,000. In 2002, median annual earnings were \$23,890, with the lowest 10 percent earning less than \$16,460. Online career sites list opportunities for a medical records coding technician with an associate's degree and two years' experience to earn an annual salary ranging from \$29,700 to \$37,000; medical records technician ranges from \$28,000 to \$34,000 (zero to two years' experience) and \$25,700 to \$39,000 (two to four years' experience).

Job Outlook

Health information technicians are in demand across the United States. The outlook continues to increase due to changes in legislation, technology, and the growing demand for patient information.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) and a certificate program in health information technology with an opportunity to sit for the national accreditation exam. (See reverse for *health information technology curriculum*.)

The program is accredited by the Commission on Accreditation of Allied Health Education Programs in cooperation with the American Health Information Management Association's Council on Accreditation.

Students take lecture and lab courses as well as clinical courses in affiliated hospital and other health care health information departments. Students are able to seek employment during the day, since courses are offered during the evening and on weekends.

■ Degree

This is a selective program with specific admissions requirements. Students in the curriculum are required to earn a grade of C or better in each course before they are allowed to proceed to the next course. For additional information, contact the program coordinator (see Contact@MC below).

■ Certificate

The medical coder/abstractor/biller certificate curriculum is designed to prepare students to work as medical coders, abstractors, and billers in health record services located in hospitals, nursing homes, ambulatory care facilities, insurance companies, and governmental agencies.

Contact @ MC

Takoma Park301-562-5519
www.montgomerycollege.edu/hit

Health Information Technology Curricula

Health Information Technology A.A.S. (TP): 349

(New admissions temporarily suspended)

General Education and Other Requirements (31 credit hours)

BI204	Human Anatomy and Physiology I*	4
BI205	Human Anatomy and Physiology II	4
CA120	Computer Applications I	3
EN101	Techniques of Reading and Writing	3
	English foundation	3
HE107	First Aid and Safety in the Home, School, and Community	2
MA110	Survey of College Mathematics or	
MA116	Elements of Statistics	3
SP108	Fundamentals of Speech or	
SP112	Business and Professional Speech Communication	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3

Health Information Technology Requirements (39 credit hours)

HI103	Assembly and Analysis and Alternate Health Care Delivery	2
HI104	Introduction to Health Information Technology	1
HI105	Legal Aspects of Health Information	1
HI106	Introduction to and Legal Aspects of Health Information Laboratory	1
HI111	Professional Practice Experience I	1
HI113	Management of Health Information	2
HI114	Automation of Health Information	2
HI125	Medical Terminology I	2
HI126	Medical Terminology II	2
HI135	Concepts of Disease	3
HI200	Coding, Abstracting, and Indexing I	4
HI203	Statistics for Health Information	2
HI204	Performance Improvement in Health Information	2
HI211	Professional Practice Experience II	2
HI212	Professional Practice Experience III	1
HI213	CPT-4 Coding	2
HI214	Introduction to Pharmacology	1
HI220	Coding, Abstracting, and Indexing II	3
HI221	Ambulatory Care Coding	2
HI222	Electronic Patient Billing	2
HI226	Research in Health Information	1
Total credit hours		70

*Students should check the prerequisite for BI 204.

Medical Coder/Abstractor/Biller Certificate (TP): 218

BI204	Human Anatomy and Physiology I*	4
BI205	Human Anatomy and Physiology II	4
EN101	Techniques of Reading and Writing	3
HI103	Assembly and Analysis and Alternate Health Care Delivery	2
HI125	Medical Terminology I	2
HI126	Medical Terminology II	2
HI135	Concepts of Disease	3
HI200	Coding, Abstracting, and Indexing I	4
HI213	CPT-4 Coding	2
HI214	Introduction to Pharmacology	1
HI220	Coding, Abstracting, and Indexing II	3
HI221	Ambulatory Care Coding	2
HI222	Electronic Patient Billing	2

Total credit hours 34

*Students should check the prerequisite for BI 204.

Admission to Montgomery College is open to all.

Math, English, and reading assessment tests are required prior to registering. (Some students may be exempt from assessment. Consult the *Montgomery College Catalog* for criteria.) Financial aid and scholarships are available to qualified candidates.

Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Careers

Managers in the hospitality industry are professionals equipped with the knowledge and skills needed to supervise the day-to-day operation of a hospitality establishment. They may be hired to work in restaurants, hotels, resorts, catering companies, or a variety of other institutions. Their jobs can include purchasing, staffing, training, supervising, and marketing. They are responsible for keeping their establishments efficient and profitable.

Assistant managers help run the day-to-day operations, and may be responsible for personnel, accounting, office administration, marketing and sales, purchasing, security, and maintenance. Computers are used extensively by lodging managers to keep track of reservations, guests' bills, and operation information.

Salary

Starting salaries vary accordingly, but most are in the \$25,000 to \$30,000 range. Median annual earnings of food service managers were \$35,790 in 2002; of lodging managers were \$33,970, but vary greatly according to responsibilities and industry (hotel, catering, etc.). Managers may earn bonuses of up to 25 percent of their basic salary in some hotels. Some establishments may provide lodging, meals, parking, laundry, and profit-sharing/educational assistance plans.

Job Outlook

Job opportunities are expected to be best for people with college degrees in hotel or restaurant management. Demand for managers is affected by industry consolidation, but additional demand is expected in suite hotels and large full-service hotels.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in hospitality management and certificate options for food and beverage management and meeting and conference planners. (*See reverse for hospitality management curricula.*)

■ Degree

The program provides skills in supervision, cost controls, sanitation, food preparation, customer service, labor relations, management, front office management, security operations, and housekeeping. General education requirements provide skills in mathematics and English.

With an A.A.S., you can enter many management training programs with a variety of employers, or you can transfer to a four-year degree program.

■ Certificate

Three certificate curricula are available:

- 1. food and beverage management**—program prepares you for employment in the food industry with skills in food and beverage management and costs, including upgrading of skills for workers already employed in the industry.
- 2. hospitality supervision and leadership**—program provides supervisory/leadership training in lodging or food service specialties.
- 3. meeting, conference, and event planning**—program provides you with a background in food and beverage management and costs, the legal aspects of lodging and food services, and the marketing of those services.

■ Letters of Recognition

Available in—food and beverage management; hospitality supervision and leadership; and meeting, conference, and event planning.

Contact @ MC

Rockville Campus301-251-7182
301-251-7191
www.montgomerycollege.edu

Hospitality Management Curricula

Marriott Hospitality Center at Montgomery College

The Marriott Hospitality Center is a grant-funded program on Montgomery College's Rockville Campus. Thanks to a generous donation from the Marriott Foundation, we offer student financial aid scholarships and educational opportunities within the field of Hospitality Management. Grant monies are also being used for facilities upgrades to the Marriott Hospitality Center Kitchen and the patio area adjacent to the kitchen.

We may be best known for our community outreach events. Each semester, we produce a series of cooking classes, lectures and book signings, culinary demonstrations, and field trips to increase student and community awareness of opportunities available within the hospitality industry.

Hospitality Management A.A.S. (R): 347

First Semester

EN101	Techniques of Reading and Writing	3
	Health foundation	1 (3)
HM101	Introduction to the Hospitality Industry	3
	Mathematics foundation	3
MG101	Principles of Management	3
	Speech foundation	3

Second Semester

	English foundation	3
FM103	Introduction to Nutrition	3
FM105	Food Service Sanitation	1
FM107	Food and Beverage Management	3
HM143	Hotel Front Office Management	3
	Natural sciences lab distribution*	4

Third Semester

AC201	Principles of Accounting	4
FM110	Principles of Food Production—Lecture	2
FM111	Principles of Food Production—Laboratory	2
HM201	Lodging and Food Service Law	3
MG103	Introduction to Marketing	3
	Behavioral and social sciences distribution	3

Fourth Semester

FM204	Catering and Banquets	3
FM208	Food and Beverage Cost Controls	3
HM207	Legal Issues in Labor Management	3
HM210	Hospitality Practicum	3
HM240	Lodging and Food Service Sales and Advertising	3
	Arts or humanities distribution†	3

Total credit hours 68 (70)

*CH 109A and B are recommended.

†A foreign language is recommended.

(more)

Hospitality Management Curricula

(continued)

Food and Beverage Management Certificate (R): 055

EN101	Techniques of Reading and Writing	3
FM103	Introduction to Nutrition	3
FM105	Food Service Sanitation	1
FM107	Food and Beverage Management	3
FM110	Principles of Food Production— Lecture	2
FM111	Principles of Food Production— Laboratory	2
FM204	Catering and Banquets	3
FM208	Food and Beverage Cost Control	3
HM210	Hospitality Practicum HM or MG elective	3
MG100	Managing Diversity in the Workplace	3
Total credit hours		29

Hospitality Supervision and Leadership Certificate (R): 233

FM107	Food and Beverage Management or	
HM143	Management of Front Office Operations FM or HM elective	3
HM100	Customer Service in the Hospitality Industry	1
HM121	Supervision and Leadership in the Hospitality Industry	3
HM201	Lodging and Food Service Law	3
HM207	Legal Issues in Labor Management	3
HM212	Managing Hospitality Human Resources	3
HM220	Hotel Property Management	3
Total credit hours		22

Meeting, Conference, and Event Planning Certificate (R): 237

FM107	Food and Beverage Management	3
FM204	Catering and Banquets	3
FM208	Food and Beverage Cost Controls	3
HM121	Supervision and Leadership in the Hospitality Industry	3
HM201	Lodging and Food Service Law	3
HM240	Lodging and Food Service Sales and Advertising	3
HM250	Meeting and Conference Operations	3
Total credit hours		21

Food and Beverage Management Letter of Recognition (R): 814

FM107	Food and Beverage Management	3
FM208	Food and Beverage Cost Controls	3
HM121	Supervision and Leadership in the Hospitality Industry	3
Total credit hours		9

Hospitality Supervision and Leadership Letter of Recognition (R): 813

HM121	Supervision and Leadership in the Hospitality Industry	3
HM207	Legal Issues in Labor Management	3
HM212	Managing Hospitality Human Resources	3
Total credit hours		9

(more)

Hospitality Management Curricula

(continued)

Meeting, Conference, and Event Planning Letter of Recognition (R): 815

FM208	Food and Beverage Cost Controls	3
HM240	Lodging and Food Service Sales and Advertising	3
HM250	Meeting and Conference Operations	3
Total credit hours		9

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

Math, English, and reading assessment tests are required prior to registering. (Some students may be exempt from assessment. Consult the *Montgomery College Catalog* for criteria.) Financial aid and scholarships are available to qualified candidates.

Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Careers

An interior designer coordinates all elements of design to create safe, functional, and aesthetic spaces. They plan the space and furnish the interiors of private homes, public buildings, and business or institutional facilities, such as offices, restaurants, retail establishments, hospitals, hotels, and theaters. They prepare drawings and specifications for non-load bearing interior construction, furnishings, lighting, and finishes. Increasingly, designers use computers to plan layouts.

Entry-level positions include consultant designer, showroom manager, and design assistant. For more career information, see www.montgomerycollege.edu/departments/crprgm/IDSources.htm.

Salary

According to the Industrial Designers Society of America, the average base salary for an industrial designer with one to two years of experience was about \$31,000 in 1998. In 2002, median annual salaries for interior designers were \$39,180.

Job Outlook

Overall, the employment of interior designers is expected to grow through 2012, due to rising demand for professional design of private homes, offices, restaurants, retail establishments, and institutions.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.), an associate of arts (A.A.), a certificate (three options available), and a letter of recognition in interior design.

■ Degree

The interior design preprofessional A.A. program offers beginning college-level courses for continued study toward an advanced degree, including general studies courses, interior design foundations, fundamental design,

drawing, color, space planning, finish treatments, and professional business practices. Technical development includes basic knowledge of drafting, historical topics, and presentation techniques for interior designers.

The interior design preprofessional A.A.S. program prepares students for entry-level positions in the interior design and related professions.

■ Certificate

Three certificate curricula are available:

(1) introductory interior design—provides new skills for individuals with no previous interior design experience.

(2) advanced interior design—provides new skills for currently employed individuals in interiors-related careers. Portfolio and/or resume review approval by the program adviser is required to enroll.

(3) design industry partnership—provides interior design knowledge as it relates to success in a career requiring professional partnership with interior designers (e.g., advertising designers, architects, business owners, contractors and builders, craftspeople, custom fabricators, fine artists, furniture designers, mural artists, faux finishers, draftspeople, theater and set designers, and Web designers).

■ Letter of Recognition

Kitchen and Bath Design Letter of Recognition is offered as a sequence of five to seven courses for students who wish to develop skills in kitchen and bath design.

Contact @ MC

Rockville Campus301-279-5142
www.montgomerycollege.edu

Interior Design Curricula

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

Math, English, and reading assessment tests are required prior to registering. (Some students may be exempt from assessment. Consult the *Montgomery College Catalog* for criteria.) Financial aid and scholarships are available to qualified candidates.

Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Interior Design—Preprofessional (R): 306 Arts and Sciences A.A.

First Semester

AR101	Drawing I	3
AR103	Design I	3
CT181	Architectural Drafting Techniques	3
ID101	Interior Design I	3
	Health foundation	1
	Mathematics foundation	3

Second Semester

	English foundation	3
ID104	Interior Design II*	3
	ID professional electives	3
	Humanities distribution	3
	Natural sciences lab distribution†	4

Third Semester

AR107	Art History I	
	or	
AR209	History of Architecture I	
	or	
ID211	Historic Interiors I*	3
ID106	Interiors: Advanced Presentation Techniques*	3
ID221	Interior Design: Residential*	3
	Behavioral and social sciences distribution	6

Fourth Semester

AR108	Art History II	
	or	
AR210	History of Architecture II	
	or	
ID212	Historic Interiors II*	3
ID222	Interior Design: Commercial/Contract*	3
ID260	Business Practices and Procedures for Interior Design*	3
SP108	Fundamentals of Speech	3
	Natural sciences non-lab distribution	3

Total credit hours 62

*This ID course is not offered every semester; advising by interior design coordinator is required.

†CH 109A and B or PH 110 is recommended.

(more)

Interior Design Curricula

(continued)

Interior Design—Preprofessional (R): 102 A.A.S.

First Semester

ID101	Interior Design I	3
ID103	Interiors: Design Principles*	3
ID105	Interiors: Technical Drawing and Drafting*	3
	Health foundation	1
	Speech foundation	3
	Behavioral and social sciences distribution	3

Second Semester

ID104	Interior Design II*	3
ID106	Interiors: Advanced Presentation Techniques*	3
ID180	Interiors: Computer Presentation Techniques*	3
	English foundation	3
	Natural sciences lab distribution†	4

Third Semester

ID211	Historic Interiors I*	3
ID221	Interior Design: Residential*	3
ID231	Textiles: History*	1
ID232	Textiles: Construction*	1
ID233	Textiles: Application*	1
	ID professional electives‡	3
	Mathematics foundation	3

Fourth Semester

ID212	Historic Interiors II*	3
ID222	Interior Design: Commercial/Contract*	3
ID260	Business Practices and Procedures for Interior Design*	3
	ID professional electives‡	6
Total credit hours		62

*This ID course is not offered every semester; advising by interior design coordinator is required.

†CH 109A and B or PH 110 is recommended.

‡Students should consult with interior design adviser before selecting professional electives. Maximum of 3 credits from ID 261, ID 262, ID 281, and ID 282. Minimum of 5 credits from ID 241, 242.

Introductory Interior Design Certificate (R): 226

ID101	Interior Design I	3
ID103	Interiors: Design Principles*	3
ID104	Interior Design II*	3
ID105	Interiors: Technical Drawing and Drafting*	3
ID106	Interiors: Advanced Presentation Techniques*	
	or	
ID180	Interiors: Computer Presentation Techniques*	3
ID211	Historic Interiors I*	
	or	
	ID professional electives†	3
ID212	Historic Interiors II*	
	or	
	ID professional electives†	3
ID260	Business Practices and Procedures for Interior Design*	3
	ID professional electives†	6

Total credit hours 30

*This ID course is not offered every semester.

†ID professional electives: ID 221, ID 222, ID 231, ID 232, ID 233, ID 241, 242, ID 261. Select electives in consultation with interior design adviser.

(more)

Interior Design Curricula

(continued)

Advanced Interior Design Certificate (R): 224

ID106	Interiors: Advanced Presentation Techniques*	
	and/or	
ID180	Interiors: Computer Presentation Techniques*	3(6)
ID211	Historic Interiors I*	
	and/or	
ID212	Historic Interiors II*	3(6)
ID221	Interior Design: Residential* and/or	
ID222	Interior Design: Commercial/Contract*	3(6)
ID260	Business Practices and Procedures for Interior Design*	3
	CT and/or ID professional electives†	9–18
Total credit hours		30

*This ID course is not offered every semester.

†Electives: ID 231, ID 232, ID 233, ID 241, 242, ID 261, ID 262, or CT ###, as determined in consultation with the interior design adviser.

Design Industry Partnership Certificate (R): 225

ID101	Interior Design I	3
ID103	Interiors: Design Principles*	3
ID104	Interior Design II*	3
ID105	Interiors: Technical Drawing and Drafting*	3
ID260	Business Practices and Procedures for Interior Design*	3
	Industry partner discipline elective†	15
Total credit hours		30†

*This ID course is not offered every semester.

†Select industry partner discipline electives related to student goals in consultation with program advisers. Elective areas may include accounting, architecture, art, building trades, business/management, computer graphics, construction, landscape, law, photography, and other areas as appropriate.

‡Up to 12 credits can be waived, with appropriate proof of career success in one of the industry partner disciplines named.

Kitchen and Bath Design Letter of Recognition (R): 812

CT283	Mechanical and Electrical Systems	3
ID180	Interiors: Computer Presentation Techniques*	3
ID243	Kitchen Design*	1
ID244	Bath Design*	1
	ID electives†	3
Total credit hours		11

*This ID course is not offered every semester.

†Students are required to consult with interior design adviser to select electives.

Careers

A landscape technician is qualified through education and work experience in the greens industry to design landscape plans; install, construct, and maintain landscapes; and plant and maintain trees, shrubs, and other plants.

Landscape architects help plan sites and integrate man-made structures with the natural environment in the least disruptive way, as well as ensure compliance with environmental regulations and land use zoning.

In preparing designs, computer-aided design (CAD) has become an essential tool. In addition, many landscape architects use video simulation to help clients envision proposed ideas and plans. For larger scale site planning, they also use geographic information systems technology, a computer mapping system.

Career opportunities include positions as landscape supervisors, nursery managers, landscape contractors, and landscape designers.

Salary

In 2002, median annual earnings for landscape architects were \$47,400 (in the federal government \$68,959). Online career sites offer positions for landscape architects with a four-year degree and four years' experience, ranging from \$38,700 to \$56,800.

Job Outlook

Overall, employment of landscape architects is expected to grow through 2012, due to growth in residential, commercial, and heavy construction.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S) and a certificate in landscape technology. (*See reverse for landscape technology curricula.*)

■ Degree

The degree program provides a mixture of academic and practical training in the field of ornamental horticulture. The curriculum is flexible to accommodate career interests in either landscape contracting or design. Students learn to design and draft landscape plans; install, construct, and maintain landscapes; and identify, select, and plant woody and herbaceous plants.

■ Certificate

The certificate curriculum provides training, skills, and technical knowledge for landscape industry employees or allows you to obtain positions in the field of ornamental horticulture. You may enter the job market immediately upon completion of the curriculum or apply earned credits toward an A.A.S. in landscape technology. Selected courses have been approved by the Maryland Department of Agriculture.

Contact @ MC

Germantown Campus301-353-7803
www.montgomerycollege.edu

Landscape Technology Curricula

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

Math, English, and reading assessment tests are required prior to registering. (Some students may be exempt from assessment. Consult the *Montgomery College Catalog* for criteria.) Financial aid and scholarships are available to qualified candidates.

Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmin.htm) or call 301-279-5000 for information.

Landscape Technology A.A.S. (G): 328

General Education and Other Requirements (23 [25] credit hours)

BI101	General Biology	4
EN101	Techniques of Reading and Writing	3
	English foundation	3
	Health foundation	1 (3)
	Mathematics foundation	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3

Landscape Technology Core Requirements (22 [23] credit hours)

BA101	Introduction to Business	
or		
MG101	Principles of Management	
or		
MG205	Organizational Behavior	3
CA120	Introduction to Computer Applications	3
CH100A	Introductory College Chemistry	
or		
CH101	Principles of Chemistry I	3 (4)
LN101	Introduction to Landscape Technology	2
LN108	Plant Materials I	3
LN109	Plant Materials II	3
LN118	Landscape Management	3
LN280	Landscape Technology Internship	2

In addition to the preceding list, select at least 15 credits from the following two course lists. Please consult a landscape technology adviser before selecting these courses.

(more)

Landscape Technology Curricula

(continued)

Landscape Technology A.A.S. (G): 328

(continued)

Landscape Contracting Courses

LN110	Herbaceous Plant Materials	3
LN115	Water Garden Management	2
LN190	Pesticide Use and Safety	2
LN204	Landscape Construction Methods and Estimating	3
LN209	Interior and Greenhouse Plants	3
LN215	Pest Management	3
LN222	Turfgrass Management	3
LN223	Diseases of Ornamental Plants	3
LN225	Nursery Management	3

Landscape Design Courses

LN110	Herbaceous Plant Materials	3
LN115	Water Garden Management	2
LN120	Landscape Graphics	3
LN130	Landscape Design	3
LN204	Landscape Construction Methods and Estimating	3

Total credit hours 60 (63)

Landscape Technology Certificate (G): 140

Landscape Technology Core Requirements (16 credit hours)

BA101	Introduction to Business	
or		
MG101	Principles of Management	
or		
MG205	Organizational Behavior	3
LN101	Introduction to Landscape Technology	2
LN108	Plant Materials I	3
LN109	Plant Materials II	3
LN118	Landscape Management	3
LN280	Landscape Technology Internship	2

In addition to the preceding list, select five courses from the following two course lists (if the same course appears in both lists, it can only be taken once to fulfill this requirement). Please consult a landscape technology adviser before selecting these courses.

Landscape Contracting Courses

LN110	Herbaceous Plant Materials	3
LN115	Water Garden Management	2
LN190	Pesticide Use and Safety	2
LN204	Landscape Construction Methods and Estimating	3
LN209	Interior and Greenhouse Plants	3
LN215	Pest Management	3
LN222	Turfgrass Management	3
LN223	Diseases of Ornamentals	3
LN225	Nursery Management	3

Landscape Design Courses

LN110	Herbaceous Plant Materials	3
LN115	Water Garden Management	2
LN120	Landscape Graphics	3
LN130	Landscape Design	3
LN204	Landscape Construction Methods and Estimating	3

Total credit hours 28 (31)

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Careers

Marketing and sales personnel are needed for any organization that wants to define and segment a market, develop strategies to satisfy or service the chosen market, or create and manage demand for the product mix or service. A marketing specialist is trained to market, sell, and promote a business or institutional product or service.

Sales worker supervisors oversee the work of sales and related workers, such as retail salespersons, cashiers, customer service representatives, stock clerks, sales engineers, and wholesale sales representatives.

Career options for students seeking management positions include marketing representatives, sales representatives, or retail managers.

Salary

Although starting salaries vary with position and experience, as well as type of firm and products sold. In 2002, median annual earnings of retail sales supervisors, including commissions, were \$29,700. The middle 50 percent earned between \$22,790 and \$40,100 a year. Median annual earnings of non-retail supervisors, including commission, were \$53,020.

Job Outlook

Employment is expected to grow through 2010 due to rising retail sales stemming from a growing population.

Education & Training Options

Montgomery College offers a management certificate and a supervisory management letter of recognition. Credits earned in the management certificate and supervisory management letter of recognition curricula may be applied toward an A.A. in general studies.

(See reverse for management curricula.)

■ Certificate

Certificate curriculum prepares you to enter the career field by providing concepts and skills relating to human resources, marketing, or management studies. Some certificates may be applied to the general management track for those who wish to continue study toward an A.A.S.

■ Letter of Recognition

Supervisory Management—Sequence of three courses in the legal requirements concerning employer/employee relations; applying the legal framework for labor/management relations; and the ramifications of discrimination in employment and in hiring, firing, and working conditions.

■ Workforce Training/Skills Upgrade

Workforce Development & Continuing Education offers management and supervision courses, as well as American Management Association courses in management and marketing.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Management Curricula

Degrees, Certificates, and Letters of Recognition

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Admission to Montgomery College is open to all.

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Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Management Certificate: 145

Core Courses (9 credit hours)

MG 101	Principles of Management	3
MG 102	Principles of Supervision	3
MG 201	Business Law	3

Electives (15 credit hours)

For human resources, select from MG 120, MG 204, MG 205, MG 207, and MG 210.

For marketing, select from MG 103, MG 105, MG 106, MG 109, and MG 206.

For management studies, select any combination of MG courses or see a management studies adviser.

Total credit hours 24

Supervisory Management Letter of Recognition: 805

MG101	Principles of Management	3
MG102	Principles of Supervision	3
MG207	Legal Issues in Labor Management	3

Total credit hours 9

Careers

Mechanical engineers research, develop, design, manufacture, and test tools, engines, machines, and other mechanical devices. Many mechanical engineers work in the areas of heating and air conditioning, automotive, industrial, or manufacturing engineering.

Computers assist mechanical engineers by performing accurate and efficient computations. Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) are used for design data processing and for developing alternative designs.

Salary

Median annual earnings of mechanical engineers were \$62,880 in 2002. According to the National Association of Colleges and Employers, starting salaries for job candidates with a bachelor's degree in mechanical engineering averaged \$48,585.

Job Outlook

Mechanical engineering occupations are projected to grow more slowly than the average through 2012. Employment will continue to be driven by an increasing demand for improved machinery and machine tools in manufacturing.

Education & Training Options

Montgomery College offers a mechanical engineering track in its engineering science A.S. curriculum. (See reverse for *electrical engineering curriculum*.)

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in mechanical engineering to:

- University of Maryland College Park—follow the curriculum as published in the *Montgomery College Catalog*.

- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

■ Transfer

Formal articulation agreements exist for effective transfer of MC credits to professional engineering programs at several upper-division schools, including University of Maryland (College Park) and Rensselaer Polytechnic Institute (Troy, NY). Less formal arrangements, built on successful records of previous students, also exist with several schools nationwide, including the two private universities in Washington, D.C., that have engineering departments, Catholic and George Washington universities.

By far the largest proportion of Montgomery College engineering transfer students go to the **University of Maryland** system—and most of them to the Clark School of Engineering on the College Park campus. MC students have also transferred to well-known institutions, both public and private, including Cal. Tech, Cornell, Georgia Tech., MIT, Northwestern, Purdue, Stanford, Union, and Virginia Polytechnic Institute and State University (VPI/SU).

■ Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering and have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, who add their own special expertise on the world beyond academia.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Mechanical Engineering Curricula

Degrees, Certificates, and Letters of Recognition

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Mechanical Engineering: 404 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers*	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Behavioral and social sciences distribution	3
	Humanities distribution	3

Third Semester

ES221	Dynamics	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Behavioral and social sciences distribution	3

Fourth Semester

ES232	Thermodynamics	3
ES220	Mechanics of Materials	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Arts distribution	3

Total credit hours 61

*Students may substitute CH 102.

Careers

Mental health associates work directly with clients, focusing on their care, treatment, and rehabilitation. They have the opportunity to work in programs for preschool children, troubled adolescents, substance abusers, and senior citizens.

Technicians establish a therapeutic relationship with assigned patients, help patients with daily living and overall needs. They may be required to take vital signs, weigh patients, and collect routine specimens.

Mental health counselors emphasize prevention, and work with individuals, families, and groups to address and treat mental and emotional disorders and to promote optimum mental health. Gerontological counselors provide services to elderly persons who face changing lifestyles due to health problems, and help families cope with these changes.

Salary

Median annual earnings for mental health counselors in 2002 were \$29,940. Online career sites offer positions for mental health technicians ranging from \$20,600 to \$26,000.

Job Outlook

Formal education is necessary to gain employment as a counselor. About half of all counselors have a master's degree. Overall employment of counselors is expected to grow faster than the average through 2012.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in mental health associate. The program curriculum has three objectives:

- to prepare the career student who wants a technical curriculum for immediate paid employment upon graduation;
- to provide the transfer student with an adequate and yet flexible background so that study may be continued in the field of psychology, sociology, or social work; and
- to permit a student to continue with an education on a part-time basis, while being gainfully employed.

(See reverse for mental health associate curriculum.)

■ Degree

The curriculum is designed to educate a mental health generalist who is trained for a variety of related occupations, rather than for a specific job. Part of the curriculum consists of supervised field experiences in several different kinds of agencies and institutions in the field of human services, such as mental health, mental retardation, gerontology, drugs and alcohol rehabilitation, corrections, and school systems, and in culturally disadvantaged areas.

Contact @ MC

Takoma Park301-650-1394
www.montgomerycollege.edu

Mental Health Associate Curriculum

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

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Mental Health Associate A.A.S. (TP)

First Semester

EN101	Techniques of Reading and Writing	3
HE100	Principles of Healthier Living	1
MH101	Introduction to Mental Health I	3
MH112	Group Dynamics I	3
PY102	General Psychology	3

Second Semester

	English foundation	3
	Mathematics foundation	3
MH102	Introduction to Mental Health II	3
MH213	Group Dynamics II	3
PY221	Introduction to Abnormal Psychology	3
	Elective	1

Third Semester

MH200	Practicum, Fieldwork in Mental Health/Human Services	6
MH208	Activities Therapies	3
	Arts or humanities distribution	3
	Natural sciences lab distribution	4

Fourth Semester

MH200	Practicum, Fieldwork in Mental Health/Human Services	6
	PY elective	3
	Speech foundation	3
	Behavioral and social sciences distribution	3
	Total credit hours	60

Careers

Microcomputer technicians perform installation, troubleshooting, and repair services as field technicians, customer service technicians, or operating on site. The explosion of computer use has created a high demand for specialists to provide advice to users, as well as day-to-day administration, maintenance, and support of computer systems and networks. Technical support specialists install, modify, clean, and repair computer hardware and software.

Salary

Median annual earnings for computer support specialists in 2002 were \$39,100. Starting salaries in 2003 for help-desk support staff were \$27,500 to \$56,500, and \$51,000 to \$67,250 for more senior technical support specialists. Telecommunications technicians' median hourly earnings were \$19.06 to \$22.78 in 2002 to install, troubleshoot, repair, and maintain telecommunications equipment.

Job Outlook

Computer support specialists and administrators are projected to be among the fastest growing occupations through 2012. Job growth will continue due to improved technology. As computers and software become more complex, support specialists will be needed to provide technical assistance to customers and other users.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S) in microcomputer network technologies and certificates in electronics and wireless technology, microcomputer technician, and a letter of recognition in A+ microcomputer certification qualification. (See *reverse for Microcomputer Technologies curricula.*)

■ Degree

The microcomputer technologies A.A.S. curriculum is designed to prepare graduates for technical employment in a high-technology area. The A.A.S. track provides entry-level skills in microcomputers, wireless, networks, network cabling, repair, and service. Topics include microcomputer architecture, configuration, peripherals, and installation; basic circuit analysis and introduction to digital circuits, microcomputer troubleshooting and repair; and setting up and troubleshooting computer networks, including wireless.

■ Certificate

The certificate curricula are designed for individuals seeking a career change or career advancement.

1. electronic and wireless technology—The curricula, incorporating basic electronics and digital electronic devices and communication systems, prepares students to enter the wireless communication systems field. It also provides a foundation in cellular theory and construction of wireless communication systems.

2. microcomputer technician—The curriculum prepares students to enter the computer technician field at a more basic level than that associated with the degree program. It will qualify the student to take the A+ certificate examination and will serve as partial preparation for network certification examinations.

■ Letter of Recognition

A+ microcomputer certification

qualification—This sequence of courses is designed to develop skills in microcomputer technology that will prepare students to take the A+ certification examination.

Contact @ MC

Germantown Campus301-353-7738
www.montgomerycollege.edu

Microcomputer Network Technologies Curricula

Degrees, Certificates, and Letters of Recognition

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Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmin.htm) or call 301-279-5000 for information.

Microcomputer Network Technologies A.A.S. (G): 312

General Education and Other Requirements (23 credit hours)

EN101	Techniques of Reading and Writing	3
	English foundation	3
	Health foundation	1
	Mathematics foundation	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

Microcomputer Network Technologies Requirements (37 [38] credit hours)

MT127	Microcomputer Control Programs	3
MT130	Network Cabling Technology	3
MT140	Microcomputer Configuration and Installation	3
MT264	Microcomputer Systems Troubleshooting and Repair I	4
MT270	Networks I: Installation, Operation, Troubleshooting	4
MT271	Networks II: Installing, Configuring, and Maintaining the Network Operating System	4
MT272	Networks III: Advanced Networking Operating Systems	4
	Technical electives*	12 (13)

Total credit hours 60 (61)

*Choose courses with MT or NW designators, or CA 172.

(more)

Microcomputer Network Technologies Curricula

(continued)

Electronics and Wireless Technology Certificate (G): 227

MT145	Electronics for Computers	4
MT146	Digital Logic and Microprocessor Fundamentals	4
MT220	Solid State Devices	3
MT229	Communication Systems	4
MT270	Networks I: Installation, Operation, Troubleshooting	4
MT274	Introduction to Wireless Technology	4

Total credit hours 23

Microcomputer Technician Certificate (G): 210

MT127	Microcomputer Control Programs	3
MT140	Microcomputer Configuration and Installation	3
MT145	Electronics for Computers	4
MT146	Digital Logic and Microprocessor Fundamentals	4
MT264	Microcomputer Systems Troubleshooting and Repair I	4
MT270	Networks I: Installation, Operation, and Troubleshooting	4

Total credit hours 22

A+ Microcomputer Certification Qualification Letter of Recognition (G): 801

MT127	Microcomputer Control Programs	3
MT140	Microcomputer Configuration and Installation	3

Total credit hours 6

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Careers

Musicians, singers, and related workers play musical instruments, sing, compose or arrange music, or conduct groups in instrumental or vocal performances. They may perform solo or as part of a group. Musicians, singers, and related workers entertain live audiences in nightclubs, concert halls, and theaters featuring opera, musical theater, or dance. Although most of these entertainers play for live audiences, many perform exclusively for recording or production studios.

Musicians often gain their reputation or professional standing in a particular kind of music or performance. Singers interpret music, using their knowledge of voice production, melody, and harmony. They sing character parts or perform in their own individual style. Music directors conduct, direct, plan, and lead instrumental or vocal performances by musical groups, such as orchestras, choirs, and glee clubs. Composers create original music such as symphonies, operas, sonatas, radio and television jingles, film scores, or popular songs. Arrangers transcribe and adapt musical compositions to a particular style for orchestras, bands, choral groups, or individuals.

Salary

Median annual earnings of salaried musicians and singers were \$36,290 in 2002. Median annual earnings were \$43,060 in performing arts companies and \$18,160 in religious organizations. Median annual earnings of salaried music directors and composers were \$31,310 in 2002. Earnings often depend on the number of hours and weeks worked, a performer's professional reputation, and the setting. The most successful musicians earn performance or recording fees that far exceed the median earnings.

Job Outlook

Overall employment of musicians, singers, and related workers is expected to grow about as fast as the average for all occupations through 2012. Most new wage and salary jobs for musicians will arise in religious organizations. Slower-than-average growth is expected for self-employed musicians, who generally perform in nightclubs, concert tours, and other venues.

Education & Training Options

Montgomery College is a member of the National Association of Schools of Music, and offers an associate of arts degree (A.A.) in arts and sciences and a music certificate option. (See reverse for music curricula.)

Degree

The music curriculum is designed for the student who plans to 1) earn a bachelor of arts degree with a major in music; 2) earn a bachelor of music education degree; earn the bachelor of music degree with a major in performance, theory-composition, or history-literature; or 4) seek employment.

To major in music, you must first complete an audition interview with a full-time faculty member in the College's Music Department. All students, part-time and full-time, must consult an adviser from the department before registering for music classes.

Certificate

The courses required for a certificate at Montgomery College are the same as those required for music majors at professionally accredited college, universities, and conservatories, and therefore, are designed for successful transfer.

Contact @ MC

Rockville Campus301-279-5209
www.montgomerycollege.edu

Music Curricula

Degrees, Certificates, and Letters of Recognition

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Music (R): 054 Arts and Sciences A.A.

First Semester

	<i>Mathematics foundation</i>	3
MU005	Applied Music Laboratory	1
MU106	Class Piano I	2
MU115	Applied Music	2
MU123	Music Theory I (arts distribution)	3
MU124	Ear Training/Sightsinging I	2
	Major ensemble (MU 161, 171, or 172)	1
	Behavioral and social sciences distribution	3

Second Semester

EN102	Techniques of Reading and Writing*	3
MU005	Applied Music Laboratory	1
MU107	Class Piano II	2
MU116	Applied Music	2
MU150	Music Theory II	3
MU151	Ear Training/Sightsinging II	2
	Major ensemble (MU 161, 171, or 172)	1
	Behavioral and social sciences distribution	3

Third Semester

MU005	Applied Music Laboratory	1
MU211	Survey of Music Literature I	2
MU215	Applied Music	2
MU226	Music Theory III	3
MU227	Ear Training/Sightsinging III	2
	Major ensemble (MU 161, 171, or 172)	1
	Arts or humanities distribution	3
	Natural sciences lab distribution	4

Fourth Semester

	<i>Health foundation</i>	1
MU005	Applied Music Laboratory	1
MU212	Survey of Music Literature II	2
MU216	Applied Music	2
MU250	Music Theory IV	3
MU251	Ear Training/Sightsinging IV	2
	Humanities distribution	3
	Natural sciences non-lab or lab distribution	3 (4)

Total credit hours 69 (70)

*Students should check prerequisites for EN 102.

(more)

Music Curricula

(continued)

Music Certificate (R): 204

Applied Music (8 credit hours)

Students will take MU 115, MU 116, MU 215, and MU 216.

Applied Music Laboratory (4 credit hours)

Students will take MU 005 four times.

Large Ensemble (4 credit hours)

Students will take MU 161, MU 171, and/or MU 172.

Music Theory (12 credit hours)

Students will take MU 123, MU 150, MU 226, and MU 250.

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Careers

Network or computer systems administrators design, install, and support an organization's LAN (local-area network), WAN (wide-area network), network segment, Internet, or intranet system. They provide day-to-day, on-site administrative support for software users, maintain network hardware and software, analyze problems, and monitor the network to ensure availability to system users. They may also plan, coordinate, and implement network security measures.

Salary

Median annual earnings of computer support specialists were \$39,100 in 2002; network and computer systems administrators were \$54,810.

Job Outlook

Computer support specialists and administrators are projected to increase faster than the average through 2012. Job growth will continue as technology continues to improve and become more complex.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S) in network engineering and certificates in network administration and network engineering. (See reverse for *Network Engineering curricula*.)

■ Degree

Graduates complete a comprehensive program preparing them for positions involving client needs assessment, network design, network installation and maintenance, inter-network communication and connectivity, specialized network functions, and on-site network administration. Extensive classroom work and lab experience—mirroring real-world production network scenarios—augment academic instruction.

This curriculum helps prepare students for the CompTIA A+, CompTIA Network+, Microsoft Certified Professional (MCP), and Microsoft Certified Systems Engineer (MCSE) certification exams.

■ Certificate

The certificate curricula are designed for individuals seeking a career change or career advancement.

1. network administration—This curriculum helps prepare students for the CompTIA A+, CompTIA Network+, and Microsoft Certified Professional (MCP) exams. Depending on which electives are taken, it will also help students prepare for the Certified Novell Administrator (CNE), CISCO Certified Network Associate (CCNA), and Microsoft Certified Systems Engineer (MCSE) exams.

2. network engineer—This curriculum helps prepare students for the Comp TIA A+, CompTIA Network+, Microsoft Certified Professional (MCP), and Microsoft Certified Systems Engineer (MCSE) certification exams. Depending on which electives are taken, it will also help students prepare for the Certified Novell Administrator (CNE) and CISCO Certified Network Associate (CCNA) exams.

Contact @ MC

Germantown Campus301-353-7744
iti@montgomerycollege.edu

Network Engineering Curricula

Degrees, Certificates, and Letters of Recognition

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Network Engineering A.A.S. (G): 350

General Education Requirements (20–22 credit hours)

English foundation	3
Health foundation	1 (3)
Mathematics foundation	3
Speech foundation	3
Arts or humanities distribution	3
Behavioral and social sciences distribution	3
Natural sciences lab distribution	4

Fundamental Requirements (30–33 credit hours)

CA106	Computer Use and Management or	
CS110	Computer Concepts or Any NW elective from the list below with program coordinator approval	3
CS111	Basic Programming or	
CS140	Introduction to Programming	3
CS136	Systems Analysis and Design	3
MT127	Microcomputer Control Programs	3
MT140	Microcomputer Configuration and Installation	3
NW100	Introduction to Networking	3

MCSE Track 1 (Microsoft Windows NT 4.0)

NW102	Administering Microsoft Windows NT	3
NW200	Supporting Microsoft Windows NT 4.0 Core Technologies	3
NW201	Internetworking Microsoft TCP/IP on Microsoft Windows NT 4.0	3
NW202	Supporting Microsoft Windows NT Server 4.0—Enterprise Technologies	3

MCSE Track 2 (Microsoft Windows 2000+)

NW103	Microsoft Windows Professional	3
NW203	Microsoft Windows Server	3
NW204	Supporting Microsoft Windows Network Infrastructure	3
NW205	Implementing and Administering Microsoft Windows Directory Services	3

(more)

Network Engineering Curricula

(continued)

Network Engineering A.A.S.	
(G): 350 (continued)	
For Track 2, one of the following courses must be taken in lieu of one elective:	
NW206	Designing a Microsoft Windows Directory Services Infrastructure or Designing Security for a Microsoft Windows Network or Designing a Microsoft Windows Networking Services Infrastructure
	3
Electives (5–12 credit hours, depending on track)	
CA120	Introduction to Computer Applications
	3
CS2xx	Any 200-level programming language
	3
CS210	Computer Security
	3
CS216	UNIX/LINUX Operating System
	3
MT271	Networks II: Installing, Configuring, and Maintaining the Network Operating System
	4
NW152	CISCO Router Configuration and Management I
	3
NW215	Updating Support Skills from Microsoft Windows NT 4.0 to Microsoft Windows 2000
	3
NW220	System Administration for Microsoft SQL Server 6.5
	3
NW221	Novell Network Administration
	3
NW230	Creating and Configuring a Web Server Using Microsoft Tools for Microsoft Internet Information Server 4.0
	3
NW240	Microsoft Exchange Server—Concepts and Administration
	3
NW241	Microsoft Exchange Server—Design and Implementation
	3
Electives available only for MCSE Track 2; any of the following courses previously taken as a Track 2 requirement may not also be applied as an elective:	
NW206	Designing a Microsoft Windows Directory Services Infrastructure
	3
NW207	Designing Security for a Microsoft Windows Network
	3
NW208	Designing a Microsoft Windows Networking Services Infrastructure
	3
Total credit hours	60 (62)

Network Administration Certificate	
(G): 216	
Fundamental Requirements (15 credit hours)	
NW100	Introduction to Networking
	3
MCP Track 1 (Microsoft Windows NT 4.0)	
NW102	Administering Microsoft Windows NT
	3
NW200	Supporting Microsoft Windows NT 4.0 Core Technologies
	3
NW201	Internetworking Microsoft TCP/IP on Microsoft Windows NT 4.0
	3
NW202	Supporting Microsoft Windows NT Server 4.0—Enterprise Technologies
	3
MCP Track 2 (Microsoft Windows 2000+)	
NW103	Microsoft Windows Professional
	3
NW203	Microsoft Windows Server
	3
NW204	Supporting Microsoft Windows Network Infrastructure
	3
NW205	Implementing and Administering Microsoft Windows Directory Services
	3
Electives (6–8 credit hours)	
<i>Select courses from the following list. At least one course must be a 200-level NW course.</i>	
CS216	UNIX/LINUX Operating System
	3
MT271	Networks II: Installing, Configuring, and Maintaining the Network Operating System
	4
NW152	CISCO Router Configuration and Management I
	3
NW215	Updating Support Skills from Microsoft Windows NT 4.0 to Microsoft Windows 2000
	3
NW220	System Administration for Microsoft SQL Server 6.5
	3
NW221	Novell Network Administration
	3
NW230	Creating and Configuring a Web Server Using Microsoft Tools for Microsoft Internet Information Server 4.0
	3
NW240	Microsoft Exchange Server—Concepts and Administration
	3
NW241	Microsoft Exchange Server—Design and Implementation
	3
Electives available only for MCP Track 2:	
NW206	Designing a Microsoft Windows Directory Services Infrastructure
	3
NW207	Designing Security for a Microsoft Windows Network
	3
NW208	Designing a Microsoft Windows Networking Services Infrastructure
	3
Total credit hours	21(23)

(more)

Network Engineering Curricula

(continued)

Network Engineer Certificate (G): 215

Fundamental Requirements (30-33 credit hours)

CA106	Computer Use and Management or	
CS110	Computer Concepts or	
	Any NW elective from the list below with program coordinator approval	3
CS111	Basic Programming or	
CS140	Introduction to Programming	3
CS136	Systems Analysis and Design	3
MT127	Microcomputer Control Programs	3
MT140	Microcomputer Configuration and Installation	3
NW100	Introduction to Networking	3

MCSE Track 1 (Microsoft Windows NT 4.0)

NW102	Administering Microsoft Windows NT	3
NW200	Supporting Microsoft Windows NT 4.0 Core Technologies	3
NW201	Internetworking Microsoft TCP/IP on Microsoft Windows NT 4.0	3
NW202	Supporting Microsoft Windows NT Server 4.0—Enterprise Technologies	3

MCSE Track 2 (Microsoft Windows 2000+)

NW103	Microsoft Windows Professional	3
NW203	Microsoft Windows Server	3
NW204	Supporting Microsoft Windows Network Infrastructure	3
NW205	Implementing and Administering Microsoft Windows Directory Services	3

For Track 2, one of the following courses must be taken in lieu of one elective:

NW206	Designing a Microsoft Windows Directory Services Infrastructure or	
NW207	Designing Security for a Microsoft Windows Network or	
NW208	Designing a Microsoft Windows Networking Services Infrastructure	3

Network Engineer Certificate (G): 215 (continued)

Electives (3-8 credit hours)

For Track 1, select one course from each category.

Electives I

NW220	System Administration for Microsoft SQL Server 6.5	3
NW230	Creating and Configuring a Web Server Using Microsoft Tools for Microsoft Internet Information Server 4.0	3
NW240	Microsoft Exchange Server— Concepts and Administration	3
NW241	Microsoft Exchange Server— Design and Implementation	3

Electives II

CA120	Introduction to Computer Applications	3
CS2xx	Any 200-level programming language	3
CS210	Computer Security	3
CS216	UNIX/LINUX Operating System	3
MT271	Networks II: Installing, Configuring, and Maintaining the Network Operating System	4
NW152	CISCO Router Configuration and Management I	3
NW215	Updating Support Skills from Microsoft Windows NT 4.0 to Microsoft Windows 2000	3
NW221	Novell Network Administration	3

Electives available only for MCSE Track 2; any of the following courses previously taken as a Track 2 requirement may not also be applied as an elective:

NW206	Designing a Microsoft Windows Directory Services Infrastructure	3
NW207	Designing Security For Microsoft Windows Network	3
NW208	Designing a Microsoft Windows Networking Services Infrastructure	3

Total credit hours 36(38)

Careers

Nuclear engineers research and develop the processes, instruments, and systems used to derive benefits from nuclear energy and radiation. They design, develop, monitor, and operate nuclear plants used to generate power. Some specialize in the development of nuclear power sources for spacecraft or finding industrial or medical uses for radioactive materials.

Fluid dynamics is a very fundamental component of this program because the proper functioning of nuclear reactors is critically dependent on the precise control of liquids (coolant, moderator, lubricants) and gasses (steam, coolant, etc.)—often at extremes of temperature, pressure, and flow velocity.

Salary

Median annual earnings of nuclear engineers were \$81,350 in 2002. According to the National Association of Colleges and Employers, starting salary offers in 2002 for bachelor's degree candidates in nuclear engineering averaged \$50,104 a year.

Job Outlook

Nuclear engineering occupations are projected to remain good through 2012. A small occupation, employment will remain relatively unchanged, with possible increases in defense-related areas and nuclear medical technology development, and improved and enforced standards for waste management and safety.

Education & Training Options

Montgomery College offers a nuclear engineering track in its engineering science A.S. curriculum. (See reverse for nuclear engineering curriculum.)

■ Degree

This curriculum is designed to provide the first two years of a four-year program leading to the award of a B.S. in engineering. Students planning to transfer in nuclear engineering to:

- University of Maryland College Park—follow

the curriculum as published in the *Montgomery College Catalog*.

- Johns Hopkins University—follow the general engineering track.
- another engineering school—consult with a Montgomery College adviser.

■ Transfer

Formal articulation agreements exist for effective transfer of MC credits to professional engineering programs at several upper-division schools, including University of Maryland (College Park) and Rensselaer Polytechnic Institute (Troy, NY). Less formal arrangements, built on successful records of previous students, also exist with several schools nationwide, including the two private universities in Washington, D.C., that have engineering departments, Catholic and George Washington universities.

By far the largest proportion of Montgomery College engineering transfer students go to the **University of Maryland** system—and most of them to the Clark School of Engineering on the College Park Campus. MC students have also transferred to well-known institutions, both public and private, including Cal. Tech, Cornell, Georgia Tech., MIT, Northwestern, Purdue, Stanford, Union, and Virginia Polytechnic Institute and State University (VPI/SU).

■ Faculty

Four full-time faculty serve as engineering advisers. All hold their advanced degrees in either physics or engineering and have extensive personal experience with direct application of their specialties in research and industry. Most retain some level of involvement in these areas even today. They share the classroom duties with a group of part-time faculty, who add their own special expertise on the world beyond academia.

Contact @ MC

Rockville Campus301-279-5230
www.montgomerycollege.edu

Nuclear Engineering Curriculum

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

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Admission to Montgomery College is open to all.

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Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Nuclear Engineering: 405 Engineering Science A.S.

First Semester

CH135	General Chemistry for Engineers*	4
EN102	Techniques of Reading and Writing	3
ES100	Introduction to Engineering Design	3
	Health foundation	1
MA181	Calculus I	4

Second Semester

ES102	Statics	3
MA182	Calculus II	4
PH161	General Physics I	3
	Behavioral and social sciences distribution	3
	Humanities distribution	3

Third Semester

ES221	Dynamics	3
ES240	Scientific and Engineering Computation	3
MA280	Multivariable Calculus	4
PH262	General Physics II	4
	Arts distribution	3

Fourth Semester

EE204	Basic Circuit Analysis	3
ES232	Thermodynamics	3
MA282	Differential Equations	3
PH263	General Physics III	4
	Behavioral and social sciences distribution	3

Total credit hours 64

*Students may substitute CH 102.

Careers

Registered nurses (RNs) work to promote health, prevent disease, and help patients cope with illness. They are advocates and health educators for patients, families, and communities. When providing direct patient care, they observe, assess, and record symptoms, reactions, and progress; assist physicians during treatments and examinations; administer medications; and assist in convalescence and rehabilitation.

Graduates of the nursing program will be prepared to give competent nursing care to patients in hospitals, nursing homes, and other comparable health agencies under the supervision of more experienced practitioners and, with appropriate experience and further preparation, should be able to assume increasing responsibility in nursing.

Salary

Salaries for entry-level staff nurses in the acute care (hospital) setting are competitive in this area. Median annual earnings of registered nurses were \$48,090 in 2002. The middle 50 percent earned between \$40,140 and \$57,490. The lowest 10 percent earned less than \$33,970, and the highest 10 percent earned more than \$69,670. Many employers offer flexible work schedules, childcare, educational benefits, and bonuses

Job Outlook

Employment of registered nurses is expected to grow faster than the average for all occupations through 2010, and because the occupation is very large, many new jobs will result. Thousands of job openings also will result from the need to replace experienced nurses who leave the occupation.

Education & Training Options

Montgomery College offers an associate of science degree (A.S) in nursing for students who study in the nursing curriculum. (See *reverse for nursing curriculum.*)

■ Degree

The basic nursing curriculum covers two academic years, is approved by the Maryland Board of Nursing, and is accredited by the National League for Nursing Accrediting Commission. Upon completion of the curriculum, the graduate is granted the A.S. in nursing and is eligible to take the state board examination for registered nurse licensure. New graduates of all registered nursing programs are prepared for beginning staff nursing positions.

This is a selective program with specific admissions requirements. Applications should be received in the Admissions Office by April 1 for fall semester and by September 1 for spring semester.

Contact @ MC

Takoma Park Campus301-562-5529/
301-562-5530
www.montgomerycollege.edu/nursing

Nursing Curricula

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

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Take the next step.

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Nursing A.S. (TP)

First Semester

BI204	Human Anatomy and Physiology I*	4
NU105	Nursing Perspectives I	1
NU110	Foundational Concepts in Nursing*†	8
NU121	Basic Health Assessment	2
PY102	General Psychology	3

Second Semester

BI205	Human Anatomy and Physiology II	4
	Mathematics foundation	3
NU123	Nursing in Health and Illness I	4
NU124	Nursing in Mental Health and Illness	4
PY203	Human Growth and Development during the Life Span	3

Third Semester

BI203	Microbiology*	4
EN102	Techniques of Reading and Writing*	3
NU230	Nursing in Health and Illness II	8
	Arts distribution	3

Fourth Semester

NU205	Nursing Perspectives II	1
NU233	Nursing Management in Health and Illness	4
NU234	Nursing in Family, Newborn, and Women's Health	4
SO101	Introduction to Sociology	3
	Humanities distribution	3

Total credit hours 69

*Students should check prerequisites for BI 204, BI 203, EN 102, and NU 110.

†Challenge options are available in NU 110 for qualified applicants. For further information call the Nursing Office.

Careers

A legal assistant or “paralegal” is a trained specialist who can manage a law office operation, assisting the attorney with legal research and in the design and development of new procedures, techniques, services, and processes for the law office. One of a paralegal’s most important tasks is helping lawyers prepare for closings, hearings, trials, and corporate meetings. Paralegals investigate the facts of cases and ensure all relevant information is considered. They also identify appropriate laws, judicial decisions, legal articles, and other materials relevant to assigned cases. Computer use and technical knowledge has become essential to paralegal work.

Salary

Earnings of paralegals and legal assistants vary greatly. Salaries depend on education, training, experience, type and size of employer, and geographic location of the job. In 2002, full-time wage and salary paralegals and legal assistants had median annual earnings of \$37,950 (\$53,770 in federal government; \$36,030 in local government; \$34,750 in state government).

Job Outlook

Paralegals and legal assistants are projected to grow faster than the average for all occupations through 2012. Employment growth stems from law firms and other employers with legal staffs increasingly hiring paralegals to lower the cost and increase the availability and efficiency of legal services.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S) in paralegal studies, a certificate in paralegal studies, and a letter of recognition in legal analysis. (See *reverse for paralegal studies curricula.*)

■ Degree

The A.A.S. curriculum is designed for those interested in a career in a law office as a paraprofessional. It is also designed for legal secretaries presently employed in attorneys’ offices who wish to improve their skills for career advancement.

■ Certificate

Developed in cooperation with members of the Montgomery County Bar Association, this evening certificate curriculum is designed primarily for persons wishing to enter the paralegal field.

■ Letter of Recognition

This sequence of three courses is designed for persons who wish to develop skills in legal analysis.

Contact @ MC

Germantown Campus301-353-7742
Takoma Park Campus301-650-1343
www.montgomerycollege.edu

Paralegal Studies Curricula

Degrees, Certificates, and Letters of Recognition

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Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Paralegal Studies A.A.S. (G, TP): 341

First Semester

BA101	Introduction to Business	3
CA100	Keyboarding Fundamentals or	
CA131	Introduction to Word Processing Applications	1 (3)
EN101	Techniques of Reading and Writing	3
HE100	Principles of Healthier Living	1
LA101	Introduction to the Legal System Speech foundation	3

Second Semester

CA120	Introduction to Computer Applications	3
	English foundation	3
LA102	Legal Research	3
	LA elective	3
PS101	American Government Behavioral and social sciences distribution	3

Third Semester

LA103	Legal Writing	3
LA118	Civil Litigation	3
	LA elective	3
	Mathematics foundation	3
	Natural sciences lab distribution	4

Fourth Semester

LA104	Interpersonal Communications, Legal Interviewing, and Investigating Techniques	3
LA116	Real Property	3
LA120	Drafting Wills and Probating Estates in Maryland	3
	LA elective or CJ 221	3
	Arts or humanities distribution	3

Total credit hours 63 (65)

(more)

Paralegal Studies Curricula

(continued)

Paralegal Studies Certificate (G, TP): 156

Required Courses

EN101	Techniques of Reading and Writing	3
LA101	Introduction to the Legal System	3
LA102	Legal Research	3
LA103	Legal Writing*	3
LA104	Interpersonal Communications, Legal Interviewing, and Investigating Techniques	3

Electives (Select three)†

CJ221	Criminal Law	3
LA110	Maryland Contract Law	3
LA114	Domestic Relations	3
LA116	Real Property	3
LA118	Civil Litigation	3
LA120	Drafting Wills and Probating Estates in Maryland	3
LA122	Law Office Administration	3
LA125	Introduction to Corporate Law and Practice	3
LA210	Torts	3

Total credit hours 24

*A keyboarding skill of 35 wpm is required before enrolling in this course.

†Students may elect CJ 221 or any paralegal course above LA 104.

Note: This is a curriculum designed for working people who may take only one or two courses per semester; thus, it may take several semesters to complete.

Legal Analysis Letter of Recognition (G, TP): 804

LA101	Introduction to the Legal System	3
LA102	Legal Research	3
LA103	Legal Writing	3

Total credit hours 9

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Careers

Photographers produce and preserve images that paint a picture, tell a story, or record an event. Today, photographers use either a traditional camera that records images on film and developed into prints or a digital camera that electronically records images. Some photographers specialize in areas such as portrait, commercial and industrial, scientific, news, or fine arts photography.

Commercial and industrial photographers take pictures of various subjects, such as buildings, models, merchandise, artifacts, and landscapes. Portrait photographers take pictures of individuals or groups of people and often work in their own studios. News photographers, also called photojournalists, photograph newsworthy people, places, and sporting, political, and community events for newspapers, journals, magazines, or television. Fine arts photographers sell their photographs as fine artwork.

Because much photography now involves the use of computer technology, photographers must have hands-on knowledge of computer editing software.

Salary

Median annual earnings of salaried photographers were \$24,040 in 2002. The middle 50 percent earned between \$17,740 and \$34,910. The lowest 10 percent earned less than \$14,640, and the highest 10 percent earned more than \$49,920.

Job Outlook

Employment of photographers is expected to increase about as fast as the average for all occupations through 2012. Demand for portrait photographers should increase as the population grows. And, as the number of electronic versions of magazines, journals, and newspapers grows on the Internet, photographers will be needed to provide digital images.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S) in photography and five certificate options including electronic photography; photographic techniques; photography master; portrait, fashion, and photojournalism; and studio and location photography. (*See reverse for photography curricula.*)

■ Degree

The photography curriculum is intended to prepare students for careers in photography— industrial, commercial, portrait, lab technician— and management of photographic services.

■ Certificate

The certificate curricula are intended to upgrade skills for currently employed individuals or to provide new skills for a change in job specialization. It provides basic black- and - white and color photography skills, and techniques in electronic photography and digital imaging.

Choose from:

1. electronic photography
2. photographic techniques
3. photography master
4. portrait, fashion, and journalism
5. studio and location photography

Contact @ MC

Rockville Campus301-279-5256
www.montgomerycollege.edu

Curricula

Degrees, Certificates, and Letters of Recognition

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Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmin.htm) or call 301-279-5000 for information.

Photography A.A.S. (R): 342

First Semester

EN101	Techniques of Reading and Writing	3
	Health foundation	1
PG150	Photography I	3
TR104	Media Appreciation	3
	Natural sciences lab distribution	4

Second Semester

	AR elective	3
	English foundation	3
	Mathematics foundation	3
PG201	Photography II	4
	PG elective*	3

Third Semester

PG165	Electronic Photography I	4
PG260	Black-and-White Materials and Processes	3
	PG elective*	3
	Speech foundation	3
	Behavioral and social sciences distribution	3

Fourth Semester

	AA, AR, or PG elective*	3
PG265	Color Materials and Processes	3
PG275	Business Practices and Portfolio Development	3
	PG elective*	3
	Elective	3

Total credit hours 61

*Choice of electives must be approved by a photography adviser.

(more)

Photography Curricula

(continued)

Electronic Photography Certificate (R): 193

PG150	Photography I	3
PG165	Electronic Photography I	4
PG201	Photography II	4
PG220	Electronic Photography II	4
Total credit hours		15

Photographic Techniques Certificate (R): 194

PG150	Photography I	3
PG201	Photography II	4
PG260	Black-and-White Materials and Processes	3
PG265	Color Materials and Processes	3
Total credit hours		13

Photography Master Certificate (R): 196

PG150	Photography I	3
PG165	Electronic Photography I	4
PG201	Photography II	4
PG260	Black-and-White Materials and Processes	3
PG265	Color Materials and Processes	3
PG275	Business Practices and Portfolio Development	3
	PG electives*	9
	Elective selected from advertising art, art, computer applications, computer graphics, physics, printing, or television/radio disciplines*	3
Total credit hours		32

*Choice of electives must be approved by a photography adviser.

Portrait, Fashion, and Photojournalism Certificate (R): 172

PG150	Photography I	3
PG201	Photography II	4
PG210	Photojournalism	3
PG251	Portrait and Fashion Photography	3
Total credit hours		13

Studio and Location Photography Certificate (R): 192

PG150	Photography I	3
PG201	Photography II	4
PG251	Portrait and Fashion Photography	3
PG255	View Camera	3
Total credit hours		13

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Careers

Physical therapist assistants and physical therapist aides assist physical therapists in providing services that help improve mobility, relieve pain, and prevent or limit permanent physical disabilities of patients suffering from injuries or disease. Patients include accident victims and individuals with disabling conditions, such as low back pain, arthritis, heart disease, fractures, head injuries, and cerebral palsy.

Physical therapist assistants perform a variety of tasks under the direct supervision of physical therapists, including exercises, massages, electrical stimulation, paraffin baths, hot and cold packs, traction, and ultrasound. They also record the patient's responses to treatment and report to the physical therapist the outcome of each treatment.

Salary

Median annual earnings of physical therapist assistants were \$36,080 in 2002 (\$35,870 in general medical and surgical hospitals; \$35,750 in offices of other health practitioners). The middle 50 percent earned between \$30,260 and \$42,780. The lowest 10 percent earned less than \$23,530, and the highest 10 percent earned more than \$48,910.

Job Outlook

Employment of physical therapist assistants is expected to grow faster than the average through 2012, due to the rapidly growing elderly population nationwide.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in physical therapist assistant. (*See reverse for physical therapist assistant curriculum.*)

■ Degree

The curriculum provides a foundation for graduates to become highly skilled in providing patient services using physical therapy techniques under the supervision of a physical in clinics, hospitals, and many other health care settings.

This is a selective program with specific program requirements. Thirty to forty hours of volunteer experience in a physical therapy setting and completion of course BI 204 are highly recommended before entering the program. It is advised that students not hold full-time jobs during enrollment in the program because physical therapist assistant classes and lab sessions are scheduled during the day, and students are required to attend full-time or part-time clinical practicum experiences during the last four to six weeks of the second, third, and fourth semesters.

Upon completion of the A.A.S. curriculum, the student will be eligible to take the National Licensing Exam for Physical Therapist Assistants.

Contact @ MC

Takoma Park301-562-5520
www.montgomerycollege.edu/pta/

Physical Therapist Assistant Curriculum

Degrees, Certificates, and Letters of Recognition

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Take the next step.

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Physical Therapist Assistant A.A.S. (TP)

First Semester

BI204	Human Anatomy and Physiology I*	4
EN101	Techniques of Reading and Writing	3
HE107	First Aid and Safety in the Home, School, and Community	2
PT101	Introduction to Physical Therapy	1
PT102	Basic Health Skills for the Physical Therapist Assistant	2
PT103	Therapeutic Procedures I	2
PY102	General Psychology	3

Second Semester

BI205	Human Anatomy and Physiology II	4
EN102	Techniques of Reading and Writing or	
EN109	Writing for Technology and Business	3
PT105	Kinesiology	3
PT110	Therapeutic Procedures II	2
PT111	Clinical Practicum I	3
PT112	Pathology for the Physical Therapist Assistant	2

Summer Semester

	Mathematics foundation	3
	Arts or humanities distribution	3

Third Semester

PT201	Medical Reporting for the Physical Therapist Assistant	3
PT208	Therapeutic Procedures III	2
PT209	Clinical Practicum II	3
PT212	Psychological Aspects of Therapy for the Physical Therapist Assistant	3
PY203	Human Growth and Development during the Lifespan	3
	Speech foundation	3

Fourth Semester

PT211	Rehabilitation Procedures	5
PT213	Therapeutic Procedures IV	2
PT214	Clinical Practicum III	5

Total credit hours 69

*Students are encouraged to complete BI 204 prior to enrolling in PT courses; note that BI 204 has a prerequisite.

Careers

The radiologic technologist, or radiographer, takes x-rays and administers nonradioactive materials into patients' bloodstreams for diagnostic purposes. Some specialize in diagnostic imaging technologies, such as computerized tomography (CT) and magnetic resonance imaging (MRI). Upon the request of the physician, the radiographer positions the patient, determines the proper setting on the x-ray generator, and produces radiographs of the internal parts of the body.

In addition to preparing patients and operating equipment, radiologic technologists and technicians keep patient records and adjust and maintain equipment. They may also prepare work schedules, evaluate equipment purchases, or manage a radiology department.

Salary

An entry-level position in radiologic technology the hospital setting for a graduate with no prior work experience ranges from \$30,000 to \$36,900 per year. In 2002, annual earnings of radiographers were \$38,970 (\$42,470 in medical and diagnostic labs; \$39,580 in general medical and surgical hospitals; \$36,490 in offices of physicians).

Job Outlook

The employment opportunities are excellent in this career field and are expected to grow faster than the average through 2012 due to population growth and aging. Hospitals will remain the principal employer of radiologic technologists and technicians, but a greater number of new jobs will be found in offices and clinics of physicians, including diagnostic imaging centers.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in radiologic technology. (*See reverse for radiologic technology curriculum.*)

■ Degree

The curriculum requires a minimum of two years instruction and clinical experience. The program is accredited by the Joint Review Committee on Education in Radiologic Technology. Upon graduation, the student will be eligible to apply to take the certification examination given by the American Registry of Radiologic Technologists.

The curriculum has been designed to provide a transfer option for students who elect to continue studies beyond the A.A.S. This is a selective program with specific admissions requirements. For additional information, contact the Admissions Office at the Takoma Park Campus, 301-650-1501, or the program department.

Contact @ MC

Takoma Park Campus301-562-5564
www.montgomerycollege.edu/rt

Radiologic (X-Ray) Technology Curriculum

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

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Radiologic (X-Ray) Technology A.A.S. (TP)

First Semester

BI204	Human Anatomy and Physiology I*	4
RT101	Radiologic Technology I	4
RT111	Radiographic Positioning I	2
RT121	Clinical Radiology I	3
	Mathematics foundation	3

Second Semester

BI205	Human Anatomy and Physiology II	4
HI125	Medical Terminology I	2
RT102	Radiologic Technology II	4
RT112	Radiographic Positioning II	2
RT122	Clinical Radiology II	3

Summer Session

RT123	Clinical Radiology III	4
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Third Semester

EN101	Techniques of Reading and Writing	3
PY102	General Psychology	3
RT201	Radiologic Technology III	3
RT211	Radiographic Positioning III	2
RT221	Clinical Radiology IV	3

Fourth Semester

CA120	Introduction to Computer Applications	3
EN102	Techniques of Reading and Writing or	
EN109	Writing for Technology and Business	3
RT202	Radiologic Technology IV	3
RT222	Clinical Radiology V	3
	Speech foundation	3

Summer Session

RT223	Clinical Radiology VI	3
RT240	Radiologic Technology V	2

Total credit hours 69

*Students should check the prerequisites for this course.

Careers

This curriculum provides the first two years of a typical four-year curriculum leading to a baccalaureate degree in a science- or mathematics-related curriculum.

The chemistry and biochemistry track is a transfer program that provides the first two years of courses necessary for a four-year degree in chemistry or biochemistry.

The life science track is a transfer program that allows students to tailor their program to fit the needs of most colleges and universities offering a degree in biology or the biological sciences. Also, this curriculum is suitable for the student playing to transfer to a four-year institution prior to attending medical, dental, veterinary, physical therapy, podiatry, or chiropractic school.

The mathematics track is a transfer program that provides the first two years of courses necessary for a four-year degree in chemistry or biochemistry.

The physics track is a transfer program that provides the first two years of courses necessary for a four-year degree in physics.

Salary

Median annual earnings of chemists in 2002 were \$52,890. Median annual earnings of biological scientists were \$51,020 in 2002. Median annual earnings of salaried chiropractors were \$65,330 in 2002. Median annual earnings of salaried dentists were \$123,210 in 2002. Physicians have among the highest earnings of any occupation.

Median total compensation varied by specialty, for physicians in 2002, showing \$150,267 for family practice physicians; \$155,530 for internal medicine physicians; \$233,061 for obstetrics/gynecology physicians; \$255,438 for general surgery physicians; and \$306,964 for anesthesiology physicians. Median annual earnings of veterinarians were \$63,090 in 2002. Median annual earnings of salaried podiatrists were \$94,870 in 2002. Median annual earnings of mathematicians were \$76,470 in 2002. Median annual earnings of physicists in 2002 were \$85,020.

Job Outlook

Generally, jobs in the sciences will grow as fast as or faster than the average for all occupations through the year 2012.

Education & Training Options

Montgomery College offers an associate of science degree (A.S.) in science in five tracks: (1) chemistry and biochemistry, (2) environmental science and policy (3) life science, (4) mathematics, and (5) physics. (*See reverse for science curriculum.*)

■ Degree

Within each track, completion of all requirements for this curriculum will lead to the award of the A.S. in science. The curriculum is designed to provide academic flexibility in order to meet requirements of various transfer institutions.

Contact @ MC

Germantown Campus301-353-7722
Rockville Campus301-279-5031
Takoma Park Campus301-650-1690
www.montgomerycollege.edu

Science Curricula

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

Some curricula are offered at all campuses, whereas others are limited to one or two. When a curriculum is offered at a specific campus, it is indicated by G for Germantown, R for Rockville, or TP for Takoma Park.

Admission to Montgomery College is open to all.

Math, English, and reading assessment tests are required prior to registering. (Some students may be exempt from assessment. Consult the *Montgomery College Catalog* for criteria.) Financial aid and scholarships are available to qualified candidates.

Chemistry and Biochemistry: 412D Science A.S.

General Education Requirements (31 credit hours)

CH101-102	Principles of Chemistry I and II	8
	English foundation	3
	Health foundation	1
MA181	Calculus I	4
	Speech foundation	3
	Arts distribution	3
	Behavioral and social sciences distribution	6
	Humanities distribution	3

Track Requirements (25 credit hours)

BI107	Principles of Biology I	4
CH 203-204	Organic Chemistry I and II	10
MA182	Calculus II	4
PH 161,262	General Physics I and II	7

Track Electives (Select at least 4 credit hours)

Any computer science, mathematics, or physical/natural science course. If a 3-credit course is chosen, then a second general elective ranging from 1 to 4 credits must also be selected.

Total credit hours 60–63

(more)

Science Curricula

(continued)

Environmental Science and Policy: 412E Science A.S.

BI 107	Principles of Biology I or	
BI 108	Principles of Biology II	4
CH 101	Principles of Chemistry I	4
	English foundation	3
	Health foundation	1
MA 160	Elementary Applied Calculus I or	
MA 180	Precalculus or	
MA 181	Calculus I	4
	Speech foundation	3
	Arts distribution	3
	Behavioral and social sciences distribution*	6
	Humanities distribution	.3
	Literature course with an EN designator†	3

*Recommended courses are EC 202, GE 101, or one of the following: PS 101, PS 102, or PS 201.

†Check with your transfer institution.

Environmental Science and Policy: 412E Science A.S. (continued)

Track Electives (Select at least 26 credit hours)

Select from the following courses:

BA210	Statistics for Business Administration	3
BI105A	Environmental Biology	3
BI105B	Environmental Biology Laboratory	1
BI107	Principles of Biology I	4
BI108	Principles of Biology II	4
BI203	Microbiology	4
BI207	Ecology	4
BI208	Field Ecology	3
BI209	General Genetics	4
CH102	Principles of Chemistry II	4
CH120	Essentials of Organic and Biochemistry	4
CH203	Organic Chemistry I	5
CH204	Organic Chemistry II	5
EC201	Principles of Economics I	3
EC202	Principles of Economics II	3
EN101	Techniques of Reading and Writing	3
GE101	Introduction to Geography I	3
GE102	Cultural Geography	3
GE104	Physical Geography	4
GL101	Physical Geology	4
MA160	Elementary Applied Calculus I or	
MA181	Calculus I	4
MA182	Calculus II	4
PH161	General Physics I (non-lab) or	.3
PH203	General Physics I	4
PH204	General Physics II or	
PH262	General Physics II	4
PS101	American Government	3
PS102	State and Local Government	3
PS201	Comparative Politics and Governments	3
PS203	International Relations	3

Total credit hours 60

(more)

Science Curricula

(continued)

Life Science: 412A Science A.S.

General Education Requirements (31 credit hours)

BI107	Principles of Biology I	4
CH101	Principles of Chemistry I	4
	English foundation	3
	Health foundation	1
MA180	Precalculus	
	or	
MA181	Calculus I	4
	Speech foundation	3
	Arts distribution	3
	Behavioral and social sciences distribution	6
	Humanities distribution	3

Track Electives (Select at least 29 credit hours)

BI108	Principles of Biology II	4
BI203	Microbiology	4
BI209	General Genetics	4
CH102	Principles of Chemistry II	4
CH203	Organic Chemistry I	5
CH204	Organic Chemistry II	5
EN101	Techniques of Reading and Writing	3
MA181	Calculus I	4
MA182	Calculus II	4
PH203	General Physics I (non-engineering)	
	or	
PH161	General Physics I	3(4)
PH204	General Physics II (non-engineering)	
	or	
PH262	General Physics II	4

Total credit hours 60–65

Mathematics: 412B Science A.S.

General Education Requirements (31 credit hours)

	English foundation	3
	Health foundation	1
MA181	Calculus I	4
PH262-263	General Physics II and III	
	or	
CH101-102	Principles of Chemistry I and II	8
	Speech foundation	3
	Arts distribution	3
	Behavioral and social sciences distribution	6
	Humanities distribution	3

Track Requirements (18 [20] credit hours)

MA182	Calculus II	4
MA280	Multivariable Calculus	4
MA282	Differential Equations	3
MA284	Linear Algebra	4
PH161	General Physics I	
	or	
CH203	Organic Chemistry	3(5)

Track Electives* (Select at least 11 [9] cred- it hours)

CH101	Principles of Chemistry I	4
CH102	Principles of Chemistry II	4
CH203	Organic Chemistry I	5
CH204	Organic Chemistry II	5
CS225	C Programming Language	
	or	
CS226	Introduction to Object-Oriented Programming Using C++	
	or	
EE114	Programming Concepts for Engineering	3(4)
EN101	Techniques of Reading and Writing	3
ES102	Statics	3
ES220	Mechanics of Materials	3
ES221	Dynamics	3
ES240	Scientific and Engineering Computation	3
PH161	General Physics I	3
PH262	General Physics II	4
PH263	General Physics III	4

Total credit hours 60–65

*Students may select courses not on this list with approval from an adviser.

(more)

Science Curricula

(continued)

Physics: 412C Science A.S.

General Education Requirements (31 credit hours)

	English foundation	3
	Health foundation	1
MA181	Calculus I	4
PH262-263	General Physics II and III	8
	Speech foundation	3
	Arts distribution	3
	Behavioral and social sciences distribution	6
	Humanities distribution	3

Track Requirements (26 credit hours)

CH101-102	Principles of Chemistry I and II	8
MA182	Calculus II	4
MA280	Multivariable Calculus	4
MA282	Differential Equations	3
MA284	Linear Algebra	4
PH161	General Physics I	3

Track Elective (Select one)

CS225	C Programming Language	3
CS226	Introduction to Object-Oriented Programming Using C++	3
EE114	Programming Concepts for Engineering	4
EN101	Techniques of Reading and Writing	3
ES240	Scientific and Engineering Computation	3
Total credit hours		60(61)

Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmin.htm) or call 301-279-5000 for information.

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Careers

Surgical technologists, also called scrubs and surgical or operating room technicians, assist in surgical operations under the supervision of surgeons, registered nurses, or other surgical personnel. Before an operation, they help prepare the operating room by setting up surgical instruments and equipment, sterile drapes, and sterile solutions. They also get patients ready for surgery by washing, shaving, and disinfection incision sites. They transport patients to the operating room, cover them with sterile surgical drapes, and observe patients' vital signs, check charts, and assist the surgical team with putting on sterile gowns and gloves. During surgery, technologists pass instruments and other sterile supplies to surgeons and assistants.

Salary

Median annual earnings of surgical technologists were \$31,210 in 2002 (\$33,790 in physicians' offices; \$30,590 in general medical and surgical hospitals). The middle 50 percent earned between \$26,000 and \$36,740. Some companies offer signing bonuses.

Job Outlook

Employment opportunities are expected to grow through 2010 as the volume of surgery increases. Hospitals will continue to be the primary employers of surgical technologists, although much faster employment growth is expected in offices and clinics of physicians, including ambulatory surgical centers.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) and a certificate in surgical technology. (See reverse for surgical technology curricula.)

■ Degree

This curriculum requires a minimum of two years learning and clinical experience. It is accredited by the Commission on Accreditation of Allied Health Education Programs.

Upon successful completion of the program, the graduate will receive the A.A.S. and will be eligible to apply to take the certification exam given by the Association of Surgical Technologists. The curriculum has been designed to provide a transfer option for students who elect to continue studies beyond the A.A.S.

Admission to the program is selective. For information regarding the program and admissions, please call the Office of Admissions, Records, and Registration at the Takoma Park Campus at 301-650-1501.

■ Certificate

The surgical technology certificate curriculum is intended for licensed/certified health care professionals, graduates of accredited programs, or those who are registry eligible who want to move into surgical technology careers, or who wish to upgrade their skills.

The curriculum offers a broad base of surgical skills needed by those who function as integral members of the surgical team. The program is accredited by the Commission on Accreditation of Allied Health Education Programs.

Contact @ MC

Takoma Park Campus301-650-1501
www.montgomerycollege.edu/surgtech

Surgical Technology Curricula

Degrees, Certificates, and Letters of Recognition

Montgomery College is authorized by the Maryland Higher Education Commission (MHEC) to offer four degrees (associate of arts, associate of science, associate of applied science, and associate of arts in teaching) and certificates. In addition, the College recognizes students who satisfactorily complete certain course sequences with letters of recognition.

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Admission to Montgomery College is open to all.

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Take the next step.

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Surgical Technology A.A.S. (TP)

Summer Session

EN101	Techniques of Reading and Writing	3
	Mathematics foundation	3

First Semester

BI204	Human Anatomy and Physiology I*	4
HI125	Medical Terminology I	2
HI126	Medical Terminology II	2
SG101	Surgical Technologist I	6

Second Semester

BI205	Human Anatomy and Physiology II	4
SG102	Surgical Technologist II	6
SG132	Fundamentals of Pharmacology	3

Summer Session

BI203	Microbiology	4
EN102	Techniques of Reading and Writing or	
EN109	Writing for Technology and Business	3

Third Semester

PY102	General Psychology I	3
SG201	Surgical Technologist III	6
SG202	Clinical Practicum I	3
	Speech foundation	3

Fourth Semester

SG211	Surgical Technologist IV	6
SG212	Clinical Practicum II	3
	Arts or humanities distribution	3

Total credit hours 67

*Students should check the prerequisite for BI 204.

Surgical Technology Certificate (TP): 228

BI204	Human Anatomy and Physiology I	4
BI205	Human Anatomy and Physiology II	4
SG101	Surgical Technologist I	6
SG102	Surgical Technologist II	6
SG132	Fundamentals of Pharmacology	3
SG201	Surgical Technologist III	6
SG202	Clinical Practicum I	3
SG211	Surgical Technologist IV	6
SG212	Clinical Practicum II	3

Total credit hours 41

Careers

Technical writers develop scientific or technical materials, such as scientific and medical reports, equipment manuals, appendices, or operating and maintenance instructions. They also may assist in layout work.

Technical writers put scientific and technical information into easily understandable language. They prepare scientific and technical reports, operating and maintenance manuals, catalogs, parts lists, assembly instructions, sales promotion materials, and project proposals. They also plan and edit technical reports and oversee preparation of illustrations, photographs, diagrams, and charts.

Students who have taken classes in technical writing, or who have completed Montgomery College's certificate program in technical writing work for organizations such as Visa, Raycal, Denro, Vitro, Comsat, ACECOM, the U.S. government and more.

Salary

Median annual earnings for salaried technical writers were \$50,580 in 2002. The middle 50 percent earned between \$39,100 and \$64,750. The lowest 10 percent earned less than \$30,270, and the highest 10 percent earned more than \$80,900. Median annual earnings in computer and data processing services were \$51,730.

According to the Society for Technical Communication, the median annual salary for entry-level technical writers was \$41,000 in 2002.

Job Outlook

Demand for technical writers and writers with expertise in specialty areas, such as law, medicine, or economics, is expected to grow about as fast as the average through 2012 due to the continuing expansion of scientific and technical information and the need to communicate it to others.

The Washington, D.C., area is considered the second best job market in the nation for technical writers and editors.

Education & Training Options

Montgomery College offers a certificate curriculum in technical writing. (*See reverse for technical writing curricula.*)

■ Certificate

The certificate curriculum is designed for those already employed in technical positions or in related positions, seeking to move into careers in technical writing and editing, or to upgrade skills in these areas.

Contact @ MC

Germantown Campus301-353-7747
www.montgomerycollege.edu

Technical Writing Curriculum

Degrees, Certificates, and Letters of Recognition

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Take the next step.

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Technical Writing Certificate (G): 143 Statewide Program

CA161	Desktop Publishing I or	
CG120	Computer Graphics: Art and Illustration I	4
CA172	Internet and Web Literacy or CA or CS elective	3
EN101	Techniques of Reading and Writing	3
EN105	Principles of English Grammar	3
EN109	Writing for Technology and Business	3
EN125	Techniques of Proofreading and Editing	3
EN240	Organization and Development of Technical Documents	3
MG101	Principles of Management or	
MG103	Introduction to Marketing or	
MG205	Organizational Behavior	3
SP112	Business and Professional Speech Communication or	
SP212	Effective Technical Presentations	3
Total credit hours		28

Careers

Dancers perform in a variety of settings, such as musical productions, and may present folk, ethnic, tap, jazz, and other popular kinds of dance. They also perform in opera, musical theater, television, movies, music videos, and commercials, in which they may sing and act. Many dancers work with choreographers, who create original dances and develop new interpretations of existing dances. Actors perform in stage, radio, television, video, or motion picture productions. They also work in cabarets, nightclubs, theme parks, and commercials, and in "industrial" films produced for training and educational purposes. Directors are responsible for the creative decisions of a production. They interpret scripts, express concepts to set and costume designers, audition and select cast members, conduct rehearsals, and direct the work of cast and crew. Producers are entrepreneurs, overseeing the business and financial decisions of a production. They select scripts and approve development of script ideas, arrange financing, and determine the size and cost of stage, radio, television, video, or motion picture productions. Set and exhibit designers create sets for movie, television, and theater productions and design special exhibition displays.

Salary

Median annual earnings of dancers were \$21,100 in 2002. The middle 50 percent earned between \$14,570 and \$34,660. Median annual earnings of choreographers were \$29,470 in 2002. The middle 50 percent earned between \$19,590 and \$43,720. Median annual earnings of actors were \$23,470 in 2002. The middle 50 percent earned between \$15,320 and \$53,320. Median annual earnings of producers and directors were \$46,240 in 2002. The middle 50 percent earned between \$31,990 and \$70,910. Median annual earnings for set and exhibit designers were \$33,870 in 2002.

Job Outlook

Employment of dancers and choreographers is expected to increase about as fast as the average for all occupations through 2012, reflecting the public's continued interest in this form of artistic expression. Employment of actors, producers, and directors is expected to grow about as fast as the average for all occupations through 2012. Competition for jobs will be stiff due to the large number of highly trained and talented actors auditioning for roles. Only performers with the most stamina and talent will regularly find employment. Overall, the employment of designers is expected to grow about as fast as the average for all occupations through the year 2012. In addition to those that result from employment growth, many job openings will arise from the need to replace designers who leave the field.

Education & Training Options

Montgomery College offers an associate of arts degree (A.A.) in arts and sciences for students who complete the theatre/dance curriculum. (*See reverse for theatre curricula.*)

■ Degree

The theatre curricula provide a fundamental course of study and training in basic skills for students who plan to continue study at a four-year institution, expect to enter a professional training program in theatre or dance, or wish to seek professional employment in theatre, dance, or related areas. Three tracks are offered: dance, theatre performance, and theatre technical.

Contact @ MC

Rockville Campus301-279-5256
www.montgomerycollege.edu

Theatre Curricula

Degrees, Certificates, and Letters of Recognition

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Take the next step.

Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Dance (R): 128 Arts and Sciences A.A.

First Semester

DN100	Introduction to Dance	3
DN101–207	Dance technique*	3
EN101	Techniques of Reading and Writing	3
	Health foundation	1
	Mathematics foundation	3
PE101–199	Physical education elective	1
TH120	Performance Production	1

Second Semester

DN101–207	Dance technique*	3
DN120	Rhythmic Training for the Dancer	2
	English foundation	3
TH120	Performance Production	1
TH121	Movement for the Performer	3
	Natural sciences lab distribution	4
	Behavioral and social sciences distribution	3

Third Semester

DN101–207	Dance technique*	3
DN150	Introduction to Dance Composition	3
	DN elective†	2
PE101–199	Physical education elective	1
TH120	Performance Production	1
	Behavioral and social sciences distribution	3
	Humanities distribution	3

Fourth Semester

DN101–207	Dance technique*	6
	DN elective†	3
SP108	Fundamentals of Speech	3
	Arts or humanities distribution	3
	Natural sciences non-lab or lab distribution	3 (4)
Total credit hours		68 (69)

*At least three credits, elementary level or higher, must be taken in each area: ballet, modern dance, and jazz.

†Any course in dance, speech, or theatre not already required in the option may be taken to fulfill the dance elective. MU 108 may also be acceptable.

(more)

Theatre Curricula

(continued)

Theatre Performance (R): 011 Arts and Sciences A.A.

First Semester

EN101	Techniques of Reading and Writing	3
	Mathematics foundation	3
TH108	Introduction to the Theatre	3
TH109	Fundamentals of Acting	3
TH120	Performance Production	1
	Behavioral and social sciences distribution	3

Second Semester

	English foundation	3
SP108	Fundamentals of Speech	3
TH112	Intermediate Acting	3
TH114	Stagecraft I	3
TH121	Movement for the Performer	3
	Natural sciences lab distribution	4

Third Semester

	Health foundation	1
MU108	Class Voice	
	or	
SP110	Oral Interpretation	2 (3)
SP109	Voice and Diction	3
TH120	Performance Production	1
TH225	Acting for Film and Television	3
	Humanities distribution	3
	Natural sciences non-lab or lab distribution	3 (4)

Fourth Semester

	DN or PE elective(s)*	3
TH117	Fundamentals of Play Directing	3
TH120	Performance Production	1
TH219	History of Theatre I	3
	Technical theatre elective†	3
	Behavioral and social sciences distribution	3

Total credit hours 67 (69)

*Students may select dance or physical education courses for a total of three semester hours.

†Select TH 116, TH 208, or TH 230.

Theatre Technical (R): 014 Arts and Sciences A.A.

First Semester

EN101	Techniques of Reading and Writing	3
	Health foundation	1
	Mathematics foundation	3
SP108	Fundamentals of Speech	3
TH108	Introduction to the Theatre	3
TH114	Stagecraft I	3

Second Semester

	English foundation	3
PE101–199	Physical education elective*	1
TH109	Fundamentals of Acting	3
	Technical major elective†	3
	Technical theatre elective‡	3
	Natural sciences lab distribution	4

Third Semester

PE101–199	Physical education elective*	1
TH120	Performance Production	1
	Technical theatre elective	3
TR230	Organization and Administration for the Performing Arts	3
	Behavioral and social sciences distribution	3
	Humanities distribution	3
	Natural sciences non-lab or lab distribution	3 (4)

Fourth Semester

PE101–199	Physical education elective*	1
TH117	Fundamentals of Play Directing	3
TH120	Performance Production	1
TH219	History of Theatre I	3
	Technical major elective(s)‡	6
	Behavioral and social sciences distribution	3

Total credit hours 67 (68)

*Students may select dance or physical education courses for a total of three semester hours.

†Select AR 101–108, AR 127, AR 205, TR 130, or TR 131.

‡Select TH 116, TH 118, or TH 208.

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Careers

The growth of the Internet and expansion of the World Wide Web, the graphical portion of the Internet, have generated a variety of occupations related to design, development, and maintenance of Web sites and their servers. For example, webmasters are responsible for all technical aspects of a Web site, including performance issues such as speed of access, and for approving site content. Internet developers or Web developers, also called Web designers, are responsible for day-to-day site design and creation.

Salary

Salaries for Internet-related occupations ranged from \$45,500 to \$65,750 for webmasters. Median annual earnings of specialists employed in computer system design and related services were \$49,590. Starting salaries in 2003 for intranet developers ranged from \$51,250 to \$73,750.

Job Outlook

The development of new technologies usually leads to demand for various workers. The expanding integration of Internet technologies by businesses, for example, has resulted in a growing need for specialists who can develop and support Internet and intranet applications.

The growth of electronic commerce means more establishments use the Internet to conduct their business online. This translates into a need for information technology professionals who can help organizations use technology to communicate with employees, clients, and consumers. Explosive growth in these areas also is expected to fuel demand for specialists knowledgeable about network, data, and communications security.

Education & Training Options

Montgomery College offers an associate of applied science degree (A.A.S.) in Web careers and several certificate programs. (See reverse for *Web careers curricula*.)

■ Degree

There are three degree tracks for a Web Careers A.A.S.: (1) Web content, design, and marketing; (2) Web programming; and (3) Web technologies. This program is intended to prepare students for positions involving designing and maintaining professional Web sites, programming for the Web, Web security, and e-commerce. The curriculum prepares students to qualify for professional Web certification.

■ Certificate

Four certificates are offered including: (1) Internet games and simulation, (2) Web content, design, and marketing; (3) Web programming; (4) Web technologies; The certificate curricula is designed to provide training, skills, and knowledge that prepare a student for employment as a member of a Web development team.

Contact @ MC

Germantown Campus301-353-7738
Rockville Campus301-279-5185
www.montgomerycollege.edu

Web Careers Curricula

Degrees, Certificates, and Letters of Recognition

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Complete an Application for Admission form (online @ www.montgomerycollege.edu/admissions/mcadmiss.htm) or call 301-279-5000 for information.

Web Careers A.A.S.: 353

General Education and Other Requirements (23 credit hours)

EN101	Techniques of Reading and Writing	3
	English foundation	3
	Health foundation	1
	Mathematics foundation	3
	Speech foundation	3
	Arts or humanities distribution	3
	Behavioral and social sciences distribution	3
	Natural sciences lab distribution	4

Web Content, Design, and Marketing Track (38–40 credit hours)

AA110	Computer Essentials for the Graphic Designer*	4
AA214	Digital Imaging with Photoshop	4
AA216	Digital Imaging with Illustrator	
or		
CG120	Computer Graphics: Art and Illustration I	4
AA218	Graphic Design for the Web	4
AR103	Two-Dimensional Design	3
CA172	Internet and Web Literacy†	3
CA272	Web Site Development with XHTML	3
CA275	Establishing a Business Web Site	3
CG210	Computer Animation and Illustration	
or		
PR125	Web Interactivity and Animation	4
	Electives: Select two of the following courses: AC 201, AR 101, AR 105, BA 101, CA 269, CA 273, CG 222, CS 269, MG 103, and PR 120	6–8

Total credit hours for Web content, design, and marketing track **61–63**

(more)

Web Careers Curricula

(continued)

Web Careers A.A.S.: 353 (continued)

Web Programming Track (39 credit hours)

CA 172	Internet and Web Literacy†	3
CA 272	Web Site Development with XHTML	3
CA 276	Dynamic HTML with JavaScript	3
CA 277	XML and Its Applications	3
CA 278	Web Database Applications	3
CS 140	Introduction to Programming	3
CS 210	Computer Security	3
CS 213	Java Programming Language	3
CS 214	Advanced Java Programming	3
CS 215	Visual Basic Programming	3
CS 216	UNIX/LINUX Operating System	3
	Electives: Select two of the following courses: CA 269, CA 274, CS 226, CS 269, and CS 270.	6

Total credit hours for Web programming track 62

Web Technologies Track (39 credit hours)

AA 110	Computer Essentials for the Graphic Designer*	4
AA 218	Graphic Design for the Web	4
CA 172	Internet and Web Literacy†	3
CA 271	Computer Networking	3
CA 272	Web Site Development with XHTML	3
CA 273	Advanced Web Site Development	3
CA 274	Administering a Web Site	3
or		
CS 210	Computer Security	3
CA 275	Establishing a Business Web Site	3
PR 125	Web Interactivity and Animation	4
	Electives: Select three of the following courses: BA 101, CA 269, CA 276, CA 277, CA 278, CS 113, CS 140, CS 213, and CS 269	9

Total credit hours for Web technologies track 62

*Students may test out of AA 110 or they may earn credit by examination.

†Students who test out of CA 172 may substitute AR 103 Two-Dimensional Design or CA 273 Advanced Web Site Development.

Internet Games and Simulation Certificate (R): 232

CA172	Internet and Web Literacy*	3
CA272	Web Site Development XHTML	3
CA273	Advanced Web Site Development	3
CG120	Computer Graphics: Art and Illustration I	4
CG210	Computer Animation and Illustration	4
PR125	Web Interactivity and Animation	4
PR225	Flash ActionScript for Web Publishing	4
	Electives: Select two from the following groups: Design and Animation Electives: AA 110, AA 214, AA 218 or PR 120, CG 121, CG 222, PR 131, PR 232, TR 101 Programming and Technical Electives: CA 141, CA 269 or CS 269, CA 276, CA 277, CA 278, CS 113, CS 140, CS 213, EN 109	

Total credit hours 31–33

*Student who test out of CA 172 must add a third elective from the list of electives.

(more)

Web Careers Curricula

(continued)

Web Content, Design, and Marketing Certificate (R): 229

AA 110	Computer Essentials for the Graphic Designer*	4
AA 214	Digital Imaging with Photoshop	4
AA 218	Graphic Design for the Web	4
AR 103	Two-Dimensional Design	3
CA 172	Internet and Web Literacy†	3
CA 272	Web Site Development with XHTML	3
CA 275	Establishing a Business Web Site	3
CG 120	Computer Graphics: Art and Illustration I	4
CG 210	Computer Animation and Illustration or	
PR 125	Web Interactivity and Animation	4
	Electives: Select two of the following courses: AC 201, AR 101, AR 105, BA 101, CA 269, CA 273, CG 222, CS 269, MG 103, and PR 120	6–8

Total credit hours 38–40

*Students may test out of AA 110 and substitute another elective, or they may earn credit by examination.

†Students who test out of CA 172 may substitute CA 273 Advanced Web Site Development.

Web Programming Certificate: 230

CA 172	Internet and Web Literacy*	3
CA 272	Web Site Development with XHTML	3
CA 276	Dynamic HTML with JavaScript	3
CA 277	XML and Its Applications	3
CA 278	Web Database Applications	3
CS 140	Introduction to Programming	3
CS 210	Computer Security	3
CS 213	Java Programming Language	3
CS 214	Advanced Java Programming	3
CS 215	Visual Basic Programming	3
CS 216	UNIX/LINUX Operating System	3
	Electives: Select two of the following courses: CA 269, CA 274, CS 226, CS 269, and CS 270.	6

Total credit hours 39

*Students who test out of CA 172 may substitute CA 273 Advanced Web Site Development.

Web Technologies Certificate (G,R): 231

AA 110	Computer Essentials for the Graphic Designer*	4
AA 218	Graphic Design for the Web	4
CA 172	Internet and Web Literacy†	3
CA 271	Computer Networking	3
CA 272	Web Site Development with XHTML	3
CA 273	Advanced Web Site Development	3
CA 274	Administering a Web Site	
or		
CS 210	Computer Security	3
CA 275	Establishing a Business Web Site	3
PR 125	Web Interactivity and Animation	4
	Electives: Select three of the following courses: BA 101, CA 269, CA 276, CA 277, CA 278, CS 113, CS 140, CS 213, and CS 269.	9

Total credit hours 39

*Students may test out of AA 110 and substitute another elective, or they may earn credit by examination.

†Students who test out of CA 172 may add a fourth elective.