DOCUMENT RESUME

ED 471 208 CE 084 250

AUTHOR Markham, Thom; Lenz, Robert

TITLE Career Academy Course Sequences.
INSTITUTION California Univ., Berkeley. Career Academy Support Network.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 2002-08-00
NOTE 28p.
CONTRACT ED-99-R-0024
AVAILABLE FROM Career Academy Support Network, 230 Main Street, Nevada City, CA 95959 ($5). Fax: 530-265-3271; e-mail: ask_casn@uclink.berkeley.edu; Web site: http://casn.berkeley.edu. For full text: http://casn.berkeley.edu/coursesequence.html.
PUB TYPE Guides - Non-Classroom (055)
EDRS PRICE EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS Agricultural Occupations; Allied Health Occupations Education; Art Education; Biological Sciences; Building Trades; Business; Business Education; *Career Academies; College Bound Students; College Preparation; Communications; Computer Science; Construction Industry; *Core Curriculum; *Course Content; Course Descriptions; *Courses; Curriculum Guides; Engineering; Environmental Education; Finance Occupations; Grade 10; Grade 11; Grade 12; Grade 9; Guidelines; Health Occupations; Hospitality Occupations; Information Technology; Instructional Materials; Managerial Occupations; Manufacturing; *Models; Natural Resources; Occupational Clusters; Secondary Education; Secondary School Curriculum; Skilled Occupations; Technical Occupations; Tourism; *Vocational Education
IDENTIFIERS *Career Paths

ABSTRACT

This career academy course sequence guide is designed to give teachers a quick overview of the course sequences of well-known career academy and career pathway programs from across the country. The guide presents a variety of sample course sequences for the following academy themes: (1) arts and communication; (2) business and finance; (3) computers and information technology; (4) engineering, manufacturing, and construction; (5) environmental science, natural resources, and agriculture; (6) health and biosciences; and (7) tourism and hospitality. In addition to course sequences for each academy theme, the guide also offers examples of specific course descriptions related to each theme. The course descriptions contain a detailed syllabus for each course plus recommended texts and sources of additional information. Because the goal of career academies is to simultaneously prepare students for college and careers, all the course descriptions provided only describe courses that meet college admission standards. The guide's introduction lists four planning guides that can be consulted as start-up or planning guides along with the names, World Wide Web addresses, and brief overviews of the programs offered by seven key sources of career academy-related information and/or providers of career academy programs that were consulted in compiling the guide. (MN)

Reproductions supplied by EDRS are the best that can be made from the original document.

University of California at Berkeley

Career Academy

Course Sequences

Thom Markham and Robert Lenz

PERMISSION TO REPRODUCE AND
DISSEMINATE THIS MATERIAL HAS
BEEN GRANTED BY

P. Ryan

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

CASN
CAREER ACADEMY SUPPORT NETWORK

BEST COPY AVAILABLE

ERIC

CAREER ACADEMY

COURSE SEQUENCES

Thom Markham and Robert Lenz

Prepared under contract to Johns Hopkins University and
the Office of Educational Research and Improvement,
U.S. Department of Education (ED-99-R-0024).
The views and opinions expressed here do not necessarily represent those
of the University of California, Johns Hopkins University, or the funding agency.

August 2002

Career Academy Support Network
University of California, Berkeley
Graduate School of Education
Berkeley, CA 94720-1674
http://casn.berkeley.edu
ask_casn@uclink.berkeley.edu

CAREER ACADEMY COURSE SEQUENCES

Table of Contents

Introduction 2

Industries:

Arts and Communications 5

Business and Finance 8

Computers and Information Technology 11

Engineering, Manufacturing, and Construction 14

Environmental Science, Nat'l Resources, and Agriculture 18

Health and Bio-Sciences 20

Tourism and Hospitality 23

Introduction

At the core of a successful career academy is a well-designed curriculum that provides a logical, linked sequence of courses for high school students over a period of two to four years. The courses should focus on the career theme, yet offer students a comprehensive, rigorous curriculum that prepares them for college. A good course sequence generally begins with scaffolding courses that prepare students for advanced work. Often, choices will be available to students as they progress through the sequence and develop a particular career focus. A well-developed course sequence facilitates scheduling for students as they think about their career goals and prepare their high school plan. The course sequence is also valuable for teachers, especially teacher teams, for planning and delivering integrated instruction across disciplines and grade levels.

Educators faced with designing a course sequence for a new career academy are often overwhelmed. Yet many others have done this before them. The challenge is finding out what established successful academies offer in the way of courses. That's the purpose of this CASN guide—to give teachers a quick overview of course sequences from well-known academy and career pathway programs from across the country. You will find a variety of sample course sequences for seven different academy themes, listed below alphabetically:

- Arts and Communication
- Business and Finance
- Computers and Information Technology
- Engineering, Manufacturing, and Construction
- Environmental Science, Natural Resources, and Agriculture
- Health and Biosciences
- Tourism and Hospitality

Course descriptions

In addition to course sequences for each academy theme, you will also find examples of specific course descriptions related to each theme. The course descriptions contain a detailed syllabus for each course, plus recommended texts and other materials. The goal of educators interested in career academies is to prepare students for both college and careers. With that in mind, the course descriptions only describe courses that meet college admission standards.

Where to find more help

In the list below, you'll find key sources for information on career academies. The place to begin is with other sections of the CASN web site (http://casn.berkeley.edu). Look at the directory of career academies (http://casn.berkeley.edu/directory.html), organized by state and locality. Check for schools near you that may have similar programs, and schedule a visit if you can. Also, use the links to educational web sites listed in the CASN Teaching and Learning Resource Guide (http://casn.berkeley.edu/pages/TLResources.html) for lesson plans, curriculum development guides, project-based learning ideas, approaches to assessment, and many other topics in education, including specifics for many academic and career fields.

In addition, you may want to consult a start-up or planning guide, such as:

1. CASN: Planning Guide for Career Academies: http://casn.berkeley.edu/planningguide.html
2. National Career Academy Coalition (NCAC): Career Academy Tool Kit http://www.ncacinc.org/publications.html
3. GMS Partners: Creating and Sustaining Small Learning Communities http://www.gmspartnersinc.org
4. National Academy Foundation (NAF): NAF Academy Planning Guide http://www.naf.org

The information for this guide has been compiled using some key sources that you may wish to access yourself:

- If you are interested in a fee-based support network for career academies in finance and business, travel and tourism, or information technology, contact the National Academy Foundation (www.naf-education.org).

- Queen Anne's County High School (http://lion.qacps.k12.md.us) in Maryland offers course sequences online for five career clusters: Arts and Communication; Biological, Environmental, and Natural Resources Technology; Business Management Systems; Engineering, Mechanical, and Construction Technology; and Health and Human Services.

- The St. Louis Public Schools, through Gateway High School in metropolitan St. Louis, has developed course sequences in four fields: Engineering and Technical Education; Health and Biological Sciences; Physical and Chemical Sciences; and Mathematics and Computer Science. Contact: Susan Katzman at Susan.Katzman@slps.org.

- Southfield Public Schools in Southfield, Michigan, (www.southfield.k12.mi.us) has academy programs in Engineering, Arts, Health and Medical, and Global Business. Look at the Academy pages on the site.

- Columbus Public Schools (www.columbus.k12.oh/us) offers many career course options to students. Look at the Career Centers page on the website, or contact the Columbus staff via email at Educational_Programs@columbus.org.

- South Grand Prairie High School near Dallas, Texas, a New American High School, (http://www.gpisd.org/gpisd/schools/highschool/sgphs/Default.htm) offers academy pathways in: Business and Computer Technology; Creative and Performing Arts; Health Sciences and Human Services; Communications, Humanities, and Law; and Math, Science, and Engineering.

- Most of the course descriptions here are taken from the University of California interactive web site (www.ucop.edu/a-g), which lists approved career-based electives for the University of California system. On this site you will find downloadable course descriptions, textbook recommendations, and additional contact information. Use these courses to add to a core of other college-preparatory academy classes that have been approved by your state or district. This will ensure that your students have the full range of post-secondary options at graduation.

Arts and Communication

Arts academies span a wide range of interests, including performing arts, visual arts, and communications. A sample sequence for each strand is listed below.

Sample course descriptions

The Arts, Media, and Entertainment category of the University of California site (www.ucop.edu/a-g) contains nearly 60 college-approved courses in the arts that can be incorporated into an academy course sequence.

A typical course sequence for Performing Arts

The Arts Academy at Southfield-Lathrup High School in Michigan provides for advanced preparation in dance, drama, vocal and instrumental music, and visual arts. In addition to academic core courses in math, English, Social Studies, and science, students are required to complete four courses in 11th and 12th grade from the following list:

Dance Technique/Dance Company
Play Production
Intermediate and Advanced Acting
Music Theory and History
Piano Lab/MIDI Computer Lab
Jazz Band
Art Research and Exploration
Visual Animation Lab
Advanced Placement Art History

Contact the coordinator at Southfield at (248) 746-7433, or look at the website (www.southfield.k12.mi.us/academy/art), for specific information on course content. Other Arts academies add electives such as Mythology and Folklore, Survey of American Music, or Guitar Musicianship.

A typical course sequence for Visual Arts and Communication

Queen Anne's County High School (http://lion.qacps.k12.md.us) provides a solid example of course requirements for a visual arts sequence. Over four years, students complete college academic requirements in English, Math, Science, and Social Studies. All students in this academy also complete Computer Technology and Computer Applications. In addition, students with a visual arts emphasis choose four required courses from:

Fundamentals of Art
Ceramics & Sculpture
Production Graphics
Graphic Arts
Life Drawing

Additional elective courses include Communications Technology, Studio Techniques, and Wood Sculpture. This program of study also requires internships and three semesters of foreign language, as well as providing for dual enrollment at the local community college.

For students interested primarily in communications, required courses include Graphic Arts, Journalism, Communications Technology, and Speech/Oral Communication. Students choose six electives from a list that includes Creative Writing, Introduction to Drama, Advanced Journalism, Production Graphics, Psychology, and Yearbook.

The Columbus Academies begin with foundation courses in 9th and 10th grades, then encourage students to choose a career path in communications media, performing arts, or visual arts. The sequences for the three paths are:

Grade	Communications and Media	Performing Arts	Visual Arts
10th (same courses for all three paths)	Introduction to World Literature & Composition Geometry or Algebra II Science Social Studies Foreign Language Arts and Communication Foundations / PC App. I Health Elective(s)	Introduction to World Literature & Composition Geometry or Algebra II Science Social Studies Foreign Language Arts and Communication Foundations / PC App. I Health Elective(s)	Introduction to World Literature & Composition Geometry or Algebra II Science Social Studies Foreign Language Arts and Communication Foundations / PC App. I Health Elective(s)
11th	American Literature Algebra II or Pre-Calculus Chemistry or Physics Social Studies Foreign Language Introduction to Multimedia Intro. to Computer Graphics Two-Dimensional Design Elective(s)	American Literature Algebra II or Pre-Calculus Chemistry or Physics Social Studies Foreign Language **MUSIC:** Basic Keyboard Fundamentals/ Music Theory **THEATRE:** Acting I/Acting II Stagecraft **DANCE:** Classical Ballet I Beginning Tap Elective(s)	American Literature Algebra II or Pre-Calculus Chemistry or Physics Social Studies Foreign Language Beginning Drawing B&W Photography/ Introduction to Composition Graphics Elective(s)

12th	College English Calculus Democratic Citizenship Foreign Language or Elective Phys. Education I & II Speech Magazine Publication Creative Writing Design & Typography Elective(s)	College English Calculus Democratic Citizenship Foreign Language or Elective Phys. Education I & II Speech **MUSIC:** Introduction to Elements of Music Musicianship I **THEATRE:** Introduction to Theatre Fundamentals of Acting Technical Fundamental of Production **DANCE:** Beginning Jazz Afro-American/Afro-Caribbean Music Elective(s)	College English Calculus Democratic Citizenship Foreign Language or Elective Phys. Education I & II Speech Advanced B&W Photo Electronic Publishing Two-Dimensional Design Elective(s)

Summer academic or career enrichment courses are an important element in the Columbus program. For example, students may take the following courses in the summer:

Multimedia Computer Systems
Fundamentals of Music Theory
Beginning Tap Dance
World Music
Beginning Painting
Survey of Graphic Communications

Business and Finance

With 20 years experience and a network of 275 academies enrolling over 16,000 students, NAF (www.NAF-education.org) is a premier resource for finance and business academies.

Queen Anne's County High School in Maryland (http://lion.qacps.k12.md.us) also offers an academy sequence in Business Management Systems.

Sample course descriptions

See the University of California site (www.ucop.edu/a-g) for career path courses under Finance and Business. There are nine courses on economics, including a Virtual Economy course for entrepreneurs and several courses with an international flavor. Also of interest is a course titled Contemporary Communications, which outlines a rigorous 12th grade Business English course.

A typical course sequence

NAF provides courses and lessons for two, three, or four-year academy sequences. Typical courses for a three-year curriculum are listed below. Note that 8 out of the 20 courses are college-approved. These courses are combined with courses in other core subjects.

Grade	Fall	Spring
10th	Introduction to Financial Services I Strategies for Success *Keyboarding/Computer Literacy *Foreign Language *College Accounting I	Introduction to Financial Services II English for Finance/Infusion Materials: Gr. 10 *Business Computer Applications *Foreign Language *College Accounting II
11th	English for Finance (Infusion Materials: Grade 11) Banking & Credit (junior-year course, unless Securities & Insurance is offered) Economics and the World of Finance Securities & Insurance (should be given in the junior year for internship preparation – given instead of International Finance) *College Accounting II	English for Finance (Infusion Materials: Grade 11) Banking & Credit (junior-year course, unless Securities & Insurance is offered) Economics and the World of Finance Securities & Insurance (should be given in the junior year for internship preparation – given instead of International Finance) *College Accounting II
12th	English for Finance (Infusion Materials: Grade 12) Banking & Credit (if not given junior year) Financial Planning International Finance (offered instead of Securities & Insurance) *College-level Finance Course	English for Finance (Infusion Materials: Grade 12) Banking & Credit (if not given junior year) Financial Planning International Finance (offered instead of Securities & Insurance) *College-level Finance Course

The Queen Anne's County High School academy curriculum looks similar, with slightly more emphasis on retail sales, marketing, and merchandising.

At Southfield High School (www.southfield.k12.mi.us/academy/business), the curriculum has been integrated into a Global Business and Information Technology Academy, with specialized courses in Accounting, Marketing, Management, and Information Technology. Academy students are required to complete courses from among the following in grades 11-12:

Introduction to Marketing
Advanced Marketing
Entrepreneurship
Small Business Ownership
Corporate Business
International Business
Business Information Systems
Computerized Accounting

The Columbus business career academies allow students to pursue paths in marketing technologies, administration and management, or accounting and finance. Sequences look like this:

Grade	Marketing Technologies	Accounting and Finance	Administration and Management
10th (same courses for all three paths)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language Introduction to Business/ PC App I Health /PC App II Elective(s)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language Introduction to Business/ PC App I Health /PC App II Elective(s)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language Introduction to Business/ PC App I Health /PC App II Elective(s)

11th	American Literature Algebra II or Pre-Calculus Chemistry or Physics Social Studies Foreign Language Marketing Principles Customer Service/ Business & the Internet Elective(s)	American Literature Algebra II or Pre-Calculus Chemistry or Physics Social Studies Foreign Language Management Personal Finance/ Customer Service Elective(s)	American Literature Algebra II or Pre-Calculus Chemistry or Physics Social Studies Foreign Language Management Small Business Develpmt/ Business Etiquette Elective(s)
12th	College English Calculus or College Math Democratic Citizenship Foreign Language or Elective PE 1/PE II Intro. to Accounting I Conference & Group Discussion/ Sales Elective(s)	College English Calculus or College Math Democratic Citizenship Foreign Language or Elective PE 1/PE II Intro. to Accounting I Conference & Group Discussion/Business Ethics Elective(s)	College English Calculus or College Math Democratic Citizenship Foreign Language or Elective PE 1/PE II Intro. to Accounting I Conference & Group Discussion/Managing Interpersonal Skills Elective(s)

Computers and Information Technology

One of the best four-year computer and information technology programs has been developed in Columbus, Ohio. Contact Educational_Programs@columbus.org.

An example of a slightly different approach is provided by Gateway High School in metropolitan St. Louis (telephone 314-776-8148), which has developed a Computer Science and Mathematics sequence.

NAF (www.NAF-education.org) also offers a computer information and technology career academy pathway.

Sample course descriptions

The University of California site (www.ucop.edu/a-g) lists 12 courses under Information Technology, including courses in statistics, music, animation, and computer programming.

A typical course sequence

The Columbus, OH, Information Technology sequence begins with foundation courses in the 9th and 10th grade. In the 11th and 12th grade, students pursue a pathway focused on Web Developer; or on Networking, Desktop, and Information Support & Service. Course sequences for each are shown on the next page.

Grade	Web Developer	Networking, Desktop, and Information Support & Service
9th (same courses for both paths)	Explorations in Literature and Composition Algebra I or Geometry Unified Science Career Connections/ Computer Literacy Fine Arts Physical Ed I/Health	Explorations in Literature and Composition Algebra I or Geometry Unified Science Career Connections/ Computer Literacy Fine Arts Physical Ed I/Health
10th (same courses for both paths)	Introduction to World Literature and Composition Geometry or Algebra II Biology Global History Foreign Language IT Foundations/PC Applications I Physical Education II / PC Apps II	Introduction to World Literature and Composition Geometry or Algebra II Biology Global History Foreign Language IT Foundations/PC Applications I Physical Education II / PC Apps II

11th	American Literature Algebra II or Pre-Calculus Physics Social Studies Foreign Language PC Operating Systems/Web Essentials E-Publishing/Advanced Information Presentations Elective(s)	American Literature Algebra II or Pre-Calculus Physics Social Studies Foreign Language PC Operating Systems/A+ PC Hardware I & II Cisco I & II Network Communication Systems Elective(s)
12th	Senior or College English Calculus or College Math Democratic Citizenship Foreign Language or Elective PE I/PE II Web Publishing/HTML Java Script Programming Elective(s)	College English Calculus or College Math Democratic Citizenship Foreign Language or Elective PE I/PE II A+ Microcomputer Fundamentals Local Area Networks Cisco II I & IV Computer Network Communication Systems Elective(s)

A typical course sequence: Computer Science and Mathematics

In St. Louis, Gateway High School offers 9th and 10th graders an opportunity to gain a foundation in both mathematics and computers. 11th and 12th grade students then choose a pathway that allows for a focus on one area, but integrates both subjects. Computer Science majors take three years of mathematics; mathematics majors enroll in four years of math and take advanced courses in computer programming. For 11th and 12 graders, the sequences are:

Grade	Computer Science	Mathematics
11th	American Literature American History Advanced Algebra Physics Computer Science I Computer Science II Computer Science III	American Literature American History Advanced Algebra Physics Computer Science I Computer Science II Computer Science III
12th	English Elective Trigonometry Elective Computer Science IV Computer Science V Computer Science VI	English Probability and Statistics Trigonometry Accounting Elective Elective Elective

Engineering, Manufacturing, and Construction

The Engineering and Manufacturing Sciences Academy at Southfield High School in Michigan (www.southfield.k12.mi.us/academy/engin.htm) provides courses that integrate math, science, and technology to prepare students for post-secondary education in manufacturing.

Queen Anne's County High School (http://lion.qacps.k12.md.us) offers a cluster of courses that prepare students who are interested in engineering, architecture, and construction technology. The courses include a foundation in science and math. Depending on choices of electives, each of these sequences can be college-preparatory.

At the Gateway Institute of Technology in St. Louis, students focus on core courses in Applied Physical Science, then at the end of the sophomore year choose a major from the following:

Chemical Industrial Laboratory
Chemistry
Engineering Chemistry
Engineering Physics
Computer Based Technology
Physics

Sample course descriptions

See the University of California site (www.ucop.edu/a-g) in the Information Technology category for the course titled Physics and Technology, a one-year lab engineering and physics course for grades 10, 11, and 12, and the course titled Engineering Mechatronics. Fifteen additional courses are also listed, ranging from core engineering courses to courses in CAD, Space Engineering, Aerospace, and Chemical Engineering. Also, see Product Development under the Manufacturing career path category, and under Building Trades, see Architectural Design and Furniture Design.

A typical course sequence: Engineering and Manufacturing

The Southfield curriculum has four strands: Design; Engineering/Technology; FAMS (The Ford Academy of Manufacturing Sciences); and Generalist. The curriculum includes at least one Advanced Placement class and a Senior Exhibition. Students in 11th and 12th grade choose from a list of courses that includes:

Engineering Technology
Advanced CAD
Electronics/Robotics
Descriptive Geometry
Statistics
Manufacturing Case Studies
Architectural Engineering
Website Design

A typical course sequence: Technology, Engineering, And Manufacturing (TEAM).

Grade	Electronic Engineering Technology	CAD Design	Mechanical Engineering Tech
10th (same courses for all three paths)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language T.E.A.M.Foundation/PC Applications I Health Elective(s)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language T.E.A.M.Foundation/PC Applications I Health Elective(s)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language T.E.A.M.Foundation/PC Applications I Health Elective(s)
11th	American Lit. & Comp. Algebra II or Pre-Calculus Physics Foreign Language Physical Education I-II DC Fundamentals/DC Lab PC Hardware/Computer Network Communication Systems Elective(s)	American Literature Algebra II or Pre-Calculus Physics Foreign Language Physical Education I-II Intro. to Manufacturing/ Computer Applications in Manufacturing Mechanical Drafting I Elective(s)	American Literature Algebra II or Pre-Calculus Physics Foreign Language Physical Education I-II Introduction to Manufacturing Mechanical Drafting I Machine Tools Elective(s)
12th	College English Calculus Democratic Citizenship Foreign Language or Elective Speech AC Fundamentals/AC Lab Electronic Devices with Electronic Devices Lab Elective(s)	College English Calculus Democratic Citizenship Foreign Language or Elective Speech CAD I CAD II Basic Mechanisms Elective(s)	College English Calculus Democratic Citizenship Foreign Language or Elective CAD I NC Machining Hydraulics/ Robotics Elective(s)

A typical course sequence: Architecture, Construction, and Engineering (ACE)

Grade	Architectural Technology	Mechanical Technology	Structural Technology
10th (same courses for all three paths)	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language A.C.E. Foundation/ PC App I Construction Drafting Manual I Elective	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language A.C.E. Foundation/ PC App I Construction Drafting Manual I Elective	Introduction to World Lit. & Composition Geometry or Algebra II Science Social Studies Foreign Language A.C.E. Foundation/ PC App I Construction Drafting Manual I Elective
11th	American Literature Algebra II or Pre-Calculus Physics Foreign Language Basic Construction Materials Management of Construction Companies Physical Education I AutoCAD I Elective	American Literature Algebra II or Pre-Calculus Physics Social Studies Foreign Language Hand Tools Laboratory Management of Construct. Companies Physical Education I AutoCAD I Elective	American Literature Algebra II or Pre-Calculus Physics Social Studies Foreign Language Construction Contract Documents Management of Construction Companies Physical Education I AutoCAD I Elective
12th	College English Calculus Democratic Citizenship Foreign Language or Elective Physical Ed II/Health AutoCAD II Structures Elective	College English Calculus Democratic Citizenship Foreign Language or Elective Phys Ed II/Health Principles of Refrigeration Piping Systems Elective	College English Calculus Democratic Citizenship Foreign Language or Elective Physical Ed II/ Health Building Construction Methods Basic Construction Materials Elective

A typical course sequence: Engineering Physics

In St. Louis, the sequence for Engineering Physics is:

10th Grade	11th Grade	12th Grade
American Literature World History Geometry Quantitative Physical Science Elective Elective	American Literature Advanced Algebra Chemistry Industrial Physics or Physics Fabrication Electronics Elective	Senior English American History Trigonometry Advanced Physics Elective Elective Elective

Environmental Science, Natural Resources, and Agriculture

Queen Anne's County High School (http://lion.qacps.k12.md.us) in Maryland offers career courses in Biological, Environmental, and Natural Resources Technology that prepares students for bachelor's level programs leading to careers such as forest ranger, agricultural engineer, biologist, horticulturist, landscape architect, or veterinarian.

Sample course descriptions

All the electives necessary to design a course sequence for an academy in agriculture or the environment are listed on the University of California website (www.ucop.edu/a-g), including Oceanography and Ecoliteracy.

Course sequences

At Queen Anne's, students pursue different sequences: Research and Development, Agriscience, Veterinary Science, or Natural Resource Management. Typically, students choose four required courses from the following lists:

Research and Development	Agri-Science
Chemistry Foreign Language Advanced Biology Environmental/Marine Science Advanced Placement Biology Horticulture Advanced Placement Chemistry Aquaculture Biotechnology Biology Genetics Veterinary Science	Advanced Horticulture Agribusiness Aquaculture Biotechnology Leadership, Development, and Management Natural Resources and Forestry Management Veterinary Science Wildlife, Recreation and Parks Management
Veterinary Science	**Natural Resources Management**
Chemistry Biology Advanced Biology Advanced Placement Biology Advanced Placement Chemistry Aquaculture Biotechnology Genetics Veterinary Science Wildlife, Recreation and Parks Management	Advanced Horticulture Agribusiness Aquaculture Biotechnology Environmental/Marine Sciences Introduction to Horticulture Natural Resources and Forestry Management Wildlife, Recreation and Parks Management

Additional course requirements (depending on the emphasis):

Advanced Placement Probability and Statistics
Computer Applications
Psychology
World Geography
Technical Drafting
Supervised Career Orientation
Directed Work (Independent Study)
Business Management
Additional Science electives
Additional Business electives
Additional Math electives
Internship
Entrepreneurship

23

A typical course sequence for Biological, Environmental, and Natural Resources Technology

9th Grade	10th Grade	11th Grade	12th Grade
English Algebra I or Geometry Earth Science or Biology Government Physical Education/Health Fine Arts Technical Education	English Geometry or Advanced Algebra Biology or Physics American History Foreign Language or Computer Applications Electives	English Advanced Algebra or Trigonometry/ Pre-calculus Chemistry World History Required courses from Area of Emphasis (2) Course from Additional course requirements list	English Calculus or Advanced Placement Calculus Required courses from Area of Emphasis (2) Courses from Additional course requirements list (2) Elective

Health and Bio-Sciences

Health is a popular theme for academies. The emphasis varies from health services to biotechnology. Four examples are: the Health and Medical Sciences Academy at Southfield High School (www.southfield.k12.mi.us/academy/health); the Health and Human Services cluster at Queen Anne's County High School (http://lion.qacps.k12.md.us); the Health Sciences Academy in Columbus; and the Medical Laboratory Science major at the Gateway High School in St. Louis.

Sample course descriptions

For course descriptions for Health Services academies, see Biotechnology and Laboratory Science on the University of California site (www.ucop.edu/a-g). The courses include excellent course descriptions for Genetics, Medical Research, and Veterinary Science. Also, there is an approved, specialized English course for 11th graders interested in the medical field.

A typical course sequence for Health and Medical Sciences

In addition to academic core courses in math, English, social studies, and science, students at the Southfield High School Health and Medical Sciences Academy complete courses from among the following in 11th and 12th grade:

Anatomy and Physiology
Biotechnology
Advanced Placement Biology
Health Occupations
Health Science
Advanced Placement Chemistry
Environmental Science

A typical course sequence for Health and Human Services

At Queen Anne's County High School, students in the Health and Human Services cluster prepare for health careers requiring advanced degrees by completing the following courses:

Advanced Biology
Advanced Chemistry
Foreign Language I
Foreign Language II
Computer Applications
Genetics
Advanced Placement Biology
Advanced Placement Chemistry
Two additional math courses above Algebra II at the Advanced Placement level

A typical course sequence for Medical Sciences and Sports Management

Grade	Medical Sciences	Sports Fitness and Management
10th (same courses for both paths)	Introduction to World Literature & Composition Geometry or Algebra II Biology Global History Foreign Language Health Sciences Foundations/PC App. Health/ Physical Education Elective(s)	Introduction to World Literature & Composition Geometry or Algebra II Biology Global History Foreign Language Health Sciences Foundations/PC App. Health/ Physical Education Elective(s)
11th	American Literature Algebra II or Pre-Calculus Chemistry Foreign Language U.S. History First Aid & Terminology Health Competencies I Elective(s)	American Literature Algebra II or Pre-Calculus Chemistry Foreign Language U.S. History First Aid & Terminology Personal Fitness Concepts/Introduction to Sports & Fitness Management Elective(s)
12th	College English College Math Democratic Citizenship Foreign Language or Elective Psychology Anatomy & Physiology or Biology Health Competencies II Elective(s)	College English College Math Democratic Citizenship Foreign Language or Elective Psychology Anatomy & Physiology or Biology Introduction to Weight Training/Aerobic Fitness Elective(s)

A typical course sequence for Medical Laboratory Science

9th Grade	10th Grade	11th Grade	12th Grade
English	American Literature	American Literature	Senior English
Social Studies	World History	American History	Ethics in Science & Tech.
Algebra	Geometry	Advanced Algebra	Trigonometry
Biology	Chemistry	Anatomy & Physiology	Medical Lab Tech I
Careers in Tech	Computer Science	First Responder	Medical Lab Tech II
Physical Education	Elective	Health Careers Survey I	Medical Lab Tech III
Elective	Elective	Health Careers Survey II	Elective

Tourism and Hospitality

NAF (www.NAF-education.org) is a premier resource for tourism, travel, and hospitality academies.

Sample course descriptions

See the University of California a-g site (www.ucop.edu/a-g) for Elements of Oral Communication, an English course for grades 9 –12, listed under Hospitality, Tourism, and Recreation. Most of the courses for this theme-based academy, however, must be lifted from other career areas. For example, see courses listed under business and finance for ideas on marketing and economics.

Typical course sequence

Academy of Travel & Tourism: Three-Year or Four-Year Program

* Indicates college acceptance

9th and/or 10th Grade	11th and 12th Grade
*Foreign Language Introduction to Travel & Tourism Strategies for Success Hospitality Module *Business Computer Applications *Global Studies *Foreign Language	English for Travel & Tourism Travel Destinations I English for Travel & Tourism II Travel Destinations II *Marketing Economics for Travel & Tourism *Foreign Language *College-Level Travel & Tourism Course Geography for Travel & Tourism *Foreign Language Systems Applications

CE064250 A

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Career Academy Course Sequences

Author(s): Thom Markham & Robert Lenz

Corporate Source: UC Berkeley, Grad School of Ed. Career Academy Support Network

Publication Date: 8/2002

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1

☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, please

Signature: Patricia Ryan

Printed Name/Position/Title: Patricia Ryan Admin Asst

Organization/Address: Career Academy Support Network, 230 Main St, Nevada City CA 95959

Telephone: (530) 265-8116

FAX: (530) 265-2611

E-Mail Address: diemra@JPS.net

Date: 12/2/02

(Over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

Cheryl Grossman
Processing Coordinator
ERIC Clearinghouse on Adult, Career, and Vocational Education
Center on Education and Training for Employment
1900 Kenny Road
Columbus, OH 43210-1090

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
4483-A Forbes Boulevard
Lanham, Maryland 20706

Telephone: 301-552-4200
Toll Free: 800-799-3742
FAX: 301-552-4700
e-mail: info@ericfac.piccard.csc.com
WWW: http://ericfacility.org