SAMPLE

STEM: Engineering and Applied Mathematics

Career Pathway Plan of Study for ► Learners ► Parents ► Counselors ► Teachers/Faculty

*This Career Pathway Plan of Study (based on the Engineering Pathway of the STEM Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. *This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.*

EDUCATION LEVELS	GRADE	[Person_1]Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Engineering Pathway	SAMPLE Occupations Relating to This Pathway
		Interest Inventory Administered and Plan of Study Available for all Learners						Aeronautical Engineer*
	8	*Interest Inventory Administered and Plan of Study Initiated for all Learners*				*10002 Computing Systems (8th-9th) or 10004 Computer Applications (8th-9th)*		Aerospace Engineer*
[Person_2]	9	English/Speech Language Arts I	Algebra I or Geometry	Earth or Life or Physical Science or Biology	World History	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Certain local student organization activities are also important including public speaking, record keeping and work-based experiences.	21004 Principles of Engineering	Application Engineer*
	10	[Person_3]	Geometry or Algebra II	Earth or Life or Physical Science or Biology	U.S. History		21053 Emerging Technologies	Applied Mathematician*
	11	[Person_4]	Algebra II or Pre-Calculus or Trigonometry	Chemistry or Physics	Political Science		21013 Aerospace Engineering	Architectural Engineer*
		College Placement Assessments-Academic/Career Advisement Provided						Civil Engineer*
	12	[Person_5]	Pre-Calculus or Trigonometry Calculus or Statistics	Chemistry or Physics	Economics Government		21007 Engineering Design and Development	Construction Engineer*
		Articulation/Dual Credit Transcripted-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.						Electrical Engineer*
POSTSECONDARY	Year 13	English . Composition English Literature	Calculus	Chemistry	American . Government Psychology	All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.	Civil Engineering Materials	Electronics Technician*
	Year 14	Speech/ Oral . Communication Technical Writing	Computer . Applications	Biological Science Physics	American History Geography		[Person_6]	Energy Transmission Engineer*
	Year 15	Continue courses in the area of specialization.						Industrial Engineer*
	Year 16							Industrial Engineering Technician*
								Materials Analyst*
								Materials Engineer*
								Materials Lab & Supply Technician*
								Mechanical Engineer
								Metallurgic Engineer*
								Plastics Engineer*
								Project Engineer*
								Project Manager*
								Quality Engineer*
								Safety Engineer*
								Scientific Visualization / Graphics Expert*
								Structural Engineer*
								Systems Design Engineer*
								Technologist*

See [Person_7] for a more complete listing of potential certifications and the governing bodies

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Project Management Professional (PMP)

Certified Research Administrator (CRA)

Electronics Technician Association, International (ETA-I) - Certifications

Association of Energy Engineers (AEE), (CEM), (CEP), (CPQ), (CLEP), (CSDP), (CEA), (BEP), (DGCP), (CGD), (EMIT), (CRM), (CBCP), (CMUP),

Certified Manufacturing Engineering Certification

STEM - Engineering and Applied Mathematics

SAMPLE Sequence of Courses for ► Instructional Leaders ► Administrators ► Counselors ► Teachers/Faculty

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Below are suggested courses that could result from steps 1-6 above. However, as an educational institution, course titles, descriptions and the sequence will be your own. This is a good model of courses for you to use as an example and to help you jump-start your process. Course content may be taught as concepts within other courses, or as modules or units of instruction.

The following courses are based on the Cluster Foundation Knowledge and Skills found at http://www.careerclusters.org/goto.cfm?id=92. These skills are reinforced through participation in student organization activities. All courses should include awareness of energy conservation measures/"green computing" and general security and legal responsibilities.

Expectation

Learners will study the nature of technology and demonstrate knowledge of the functions of STEM in business and industry. Emphasis will be placed on maintaining a safe working environment, energy conservation, ethics, and on building interpersonal skills needed for working in the IT environment. Students will demonstrate appropriate knowledge and behaviors of legal responsibilities by IT professionals. Students will explore a variety of IT career opportunities and develop a personal career plan to meet their career goals and objectives. This may be taught as a career exploration course component or as a course in conjunction with other foundation [Person_8] courses.

Introductory Level Course Options (one or more)

Foundation/Introductory Course Option #1

10004 Computer Applications: Students will use technology tools to manage personal schedules and contact information, create memos and notes, prepare simple reports and other business communications, manage computer operations and file storage, and use electronic mail, Internet applications and potentially GIS to communicate, search for and access information. Students will develop skills related to word processing, database management and spreadsheet applications. Students will demonstrate knowledge of hardware components, classes of software, basic data communications components and trends, and technical knowledge of the Internet including Internet protocols. Students will demonstrate understanding of Internet security issues, how to use and troubleshoot Internet connections including Internet software, how to use virus protection techniques and how to use the Internet to communicate and collaborate. Students will install and configure software programs, demonstrate knowledge of Web page basics, apply knowledge of operating system principles, employ computer system interfaces and demonstrate a basic knowledge of quality assurance concepts.

Foundation/Introductory Course Option #2

10002 Computing Systems: Computing Systems courses offer a broad exploration of the use of computers in a variety of fields. These courses have a considerable range of content, but typically include the introduction of robotics and control systems, computer-assisted design, computer-aided manufacturing systems, and other computer technologies as they relate to industry applications. -- Students will demonstrate knowledge and problem-solving skills in the area of operating systems and computer hardware. This would include, but not be limited to, storage and drives, system boards, processors, memory, peripherals and networks. Emphasis will be placed on speech and client-oriented communication skills. Students will demonstrate knowledge of hardware components, classes of software, basic data communications components and trends, and technical knowledge of the Internet including Internet protocols. Students will demonstrate understanding of Internet security issues, how to use and troubleshoot Internet connections including Internet software, how to use virus protection techniques and how to use the Internet to communicate and collaborate. Students will install and configure software programs, demonstrate knowledge of Web page basics, apply knowledge of operating system principles, employ computer system interfaces and demonstrate a basic knowledge of quality assurance concepts.

Foundation/Introductory Course Option #3

21002 Engineering Applications
Engineering Applications courses provide students with an overview of the practical uses of a variety of engineering applications. Topics covered usually include hydraulics, pneumatics, computer interfacing, robotics, computer-aided design, computer numerical control, and electronics.

Foundation/Introductory Course Option #4

21003 Engineering Technology
Engineering Technology courses provide students with the opportunity to focus on one or more areas of industrial technology. Students apply technological processes to solve real engineering problems; develop the knowledge and skills to design, modify, use, and apply technology; and may also

The following courses are based on the Cluster Foundation Knowledge and Skills as well as the Pathway Knowledge and Skills found at http://www.careerclusters.org. These skills are reinforced through participation in student organization activities.

Technical Level Course Options (one or more)