The National STEM Consortium

STEM Bridge

This Implementation Guide provides information about the STEM Bridge created by the National STEM (Science, Technology, Engineering, Mathematics) Consortium (NSC). The NSC, a collaborative of ten leading community colleges in nine states, has developed new workforce training programs in five high-wage, high-skill STEM pathways: composites technology; cyber technology; electric vehicle technology; environmental technology; and mechatronics. The STEM credentials average 30 credit hours and all completers receive an industry-validated college certificate. For information on NSC, visit the NSC website: http://www.nationalstem.org.

All five programs include the two-part STEM Bridge, which contextualizes remediation within the programs and provides support for the development of foundational skills for lower level learners not yet ready to enter the STEM Certificate programs. The STEM Bridge is comprised of two interactive online courses: STEM Readiness and STEM Foundations. The STEM Readiness course, which integrates basic skills, workforce skills, computer skills, and job readiness training contextualized within the STEM pathways, was designed to quickly refresh essential skills for students entering the new credit certificates directly. The STEM Foundations course was designed to help lower level learners quickly develop foundational skills in math and workplace communication in order to enter the credit certificate programs.

This guide provides information to help colleges decide whether to adopt the STEM Bridge materials and provides suggestions on how colleges might adapt the courses to suit their local needs.

Developed by the National STEM Consortium STEM Bridge Team

September, 2014
© 2014 by the National STEM Consortium.

NSC Lead College:
Anne Arundel Community College, Arnold, Maryland
Susan Gallagher, Project Director

NSC STEM Bridge Team Leads:
Anne Arundel Community College, Arnold, Maryland
Janet Paulovich, Program Coordinator
Kimberly Law, Program Coordinator

NSC STEM Bridge Implementation Guide:
Janet Paulovich and Kimberly Law, authors;
Kristina Lamb and Susan Gallagher, editors
## Contents

Welcome to NSC STEM Bridge ........................................................................................................1

The National STEM Consortium .................................................................................................1

The STEM Bridge ..........................................................................................................................1

  Design and Development ........................................................................................................1

  Learning Outcomes ..................................................................................................................3

  STEM Readiness......................................................................................................................3

    **STEM Readiness UNIT 1: Math** .......................................................................................3

    **STEM Readiness UNIT 2: Critical Thinking and Workplace Communication** ......................8

    **STEM Readiness UNIT 3: Professional Skills** ..................................................................10

STEM Foundations .....................................................................................................................13

  **STEM Foundations UNIT 1: Workplace Communication** ..................................................13

  **STEM Foundations UNIT 2: Math** ....................................................................................14

Adopting and Adapting the Program .........................................................................................16

Accessing and Utilizing the Online Courses ...........................................................................16

Equipment and Classroom Space .............................................................................................17

Personnel ...................................................................................................................................17

Course Scheduling ....................................................................................................................18

About These Materials .............................................................................................................18

Using These Materials .............................................................................................................18

Copyright ...................................................................................................................................18

License .......................................................................................................................................18

Attribution and Citation ...........................................................................................................19

Accessibility ...............................................................................................................................19

Disclaimer .................................................................................................................................19
Welcome to NSC STEM Bridge

This is a guide to the STEM Bridge resources developed by the National STEM (Science, Technology, Engineering, Mathematics) Consortium (NSC). It is intended to help college administrators—deans and department heads as well as program chairs, directors, and coordinators—decide whether to adopt the resources, and provides suggestions on how to adapt them for local needs.

The National STEM Consortium

The NSC has developed new training programs in five technical pathways: Composites Technology, Cyber Technology, Electric Vehicles Technology, Environmental Technology, and Mechatronics. The certificate-level credential is an often-missing, but critical, on-ramp to career pathways for adult learners and others who often lack access to and awareness of high-demand careers in STEM fields.

NSC programs are designed for student success, combining best practices such as outcomes-driven instruction, cohort structure, block scheduling, compressed timeline, enhanced student support services, blended delivery, and an embedded STEM Bridge to boost student skills in mathematics, communication, and professionalism.

The STEM Bridge

Design and Development

One of the most innovative educational strategies that the NSC has used to improve the completion and success rates of students is a two-part STEM Bridge program, created by the NSC STEM Bridge Team - faculty and staff from each of the ten colleges in the consortium. Team members included technical faculty and subject matter experts as well as developmental or adult educators at consortium member colleges. The group surveyed technical faculty to determine the essential skills that were needed by professionals in the NSC pathways. The STEM Bridge Team then had intensive discussion about the skill sets of students, especially non-traditional students. The team determined that they would need to design two strategies:
The first STEM Bridge strategy was to embed competency development into the technical curriculum instead of using a traditional pre-program approach to developmental education. This has been done through the development of an innovative STEM Readiness course which integrates basic skills, workforce skills, computer skills, and job readiness training contextualized within the STEM pathways. The STEM Readiness course is programmatically consistent across the five fields and transferable to other colleges and it focuses on the development of critical key skills identified as essential workplace skills by all of the technical teams. This course was designed to quickly refresh key skills for students whose college placement test scores (Accuplacer, Compass, other) indicated that they were either “college ready” or were in need of only one developmental math course at a particular institution. The STEM Readiness course has been developed in an online format with assistance from Carnegie Mellon University’s Open Learning Initiative (OLI) and the Center for Applied Special Technology (CAST) and focuses on refreshing critical key skills in the following areas:

- Math
- Critical Thinking and Workplace Communication
- Professional Skills

NSC needs assessment of potential students led to the conclusion that many students would require more intensive, up-front development of the basic skills required for access to the technically demanding educational pathways into STEM occupations. These are students whose college placement test scores indicated that they had more than one developmental need in English and/or math. Therefore, the second STEM Bridge Strategy was to develop a modularized set of curriculum “bundles” that can be adapted and inserted by colleges wherever needed to provide support for lower level learners who need to build foundational skills in math and workplace communication before entering the credit certificates. The STEM Foundations course has been designed to help students bring their math, reading/writing, computer and critical thinking skills to the level necessary to take full advantage of the technical curriculum in one of the five programs.
The STEM Foundations course has been developed in an online format with assistance from OLI and focuses on developing critical key skills in the following areas:

- Workplace communication
- Math

**Learning Outcomes**

The STEM Bridge Team reviewed the essential skills that had been identified by the technical teams and developed a master set of learning outcomes for each of the courses. Then they engaged a number of STEM industry partners from across the consortium to help develop the learning outcomes into realistic workplace scenarios that would allow students to practice the skills that they would actually need on the job.

The STEM Readiness and STEM Foundations courses have been designed in a modularized format, with each module focused on the development of a particular set of learning outcomes.

**STEM Readiness**

The STEM Readiness Course is divided into three Units: Math, Critical Thinking and Workplace Communication, and Professional Skills. The course was developed around realistic, workplace scenarios that allow students to master the learning outcomes in each module:

**STEM Readiness UNIT 1: Math**

**Module Scenario: Beginning and Intermediate Arithmetic**

“Rusty” Gallagher has just graduated from community college as a Composites Technician and has a new job at a local defense contractor. His new income will allow him and his wife to make some different choices regarding their budget. They will apply basic math in the decision-making process.

**Beginning Arithmetic Learning Outcomes**

- Define and recognize digits, place value, whole numbers, decimal points, and decimals.
- Apply arithmetic operators to problems involving whole numbers and decimals.
- Identify which arithmetic operator to use in a given situation.
- Apply arithmetic operations to problems involving negative numbers.
- Apply critical thinking skills to larger, real-life situations and evaluate the outcomes.
Intermediate Arithmetic Learning Outcomes

• Identify fractions as they relate to a given scenario.
• Reduce a fraction to its simplest form.
• Add and subtract like fractions.
• Add and subtract unlike fractions.
• Multiply and divide fractions.
• Convert among fractions, decimals, and percentages.
• Round numbers to a specific place value.
• Convert given scenarios into algebraic expressions and equations.
• Explain what variables represent in an equation.
• Apply critical thinking skills to larger, real-life situations and evaluate the outcomes.

Module Scenario: Measuring Systems

Bob is a Composite Technician working on prototyping new car parts for an automotive company. He will use various measuring systems in the design of the new parts.

Learning Outcomes:

• Recognize various types of measurements (distance, time, temperature, and weight).
• Identify common units used for measurements.
• Identify common measuring tools for each measurement.
• Calculate the area and perimeter of rectangles and squares.
• Calculate the perimeter of polygons.
• Calculate the circumference of circles.
• Calculate the volume of rectangular prisms.
• Convert between English standard units.
• Convert between metric units.
• Convert between English standard units and metric units.
• Identify significant digits in a value.
• Apply critical thinking skills to larger, real-life situations and evaluate the outcomes.

Module Scenario: Algebraic Laws

Bob has been promoted and is working on new challenges in composites technology relating to area, perimeter, and volume.

Learning Outcomes:
• Calculate the volume of a sphere.
• Expand and multiply exponents.
• Simplify expressions using the order of operations.
• Calculate the volume of a cylinder.
• Simplify algebraic expressions by adding/subtracting common terms.
• Apply the distributive property to simplify or expand expressions.
• Substitute known values into an equation and solve.
• Express values using scientific notation.

Module Scenario: Quantifying Data

Karen is an Environmental Technician helping her friend Tony, a local newspaper reporter, to evaluate charts, graphs, and other data released by the local pulp and paper mill. The mill released the data in response to Tony’s concern that the mill is polluting the Hermoso River and causing fish and water birds to die.

Learning Outcomes:
• Recognize different types of graphs and diagrams.
• Identify types of charts, graphs, and diagrams that are appropriate to use based on a given situation.
• Apply the steps for creating a line graph.
• Read and Interpret charts, graphs, and diagrams.
• Define mean, median, and mode.
• Determine the mean of a data set.
• Determine the median and mode of a data set, given a data table.
• Apply critical thinking skills to larger, real-life situations and evaluate the outcomes.

**Module Scenario: Beginning Algebra**

Jay is an intern working for ElecAuto, Inc. The company designs and produces electric vehicles. Jay will be testing a wide variety of electric car parts. Many of the tests require him to use algebra as he conducts the measurements to find out if the car parts work correctly.

**Learning Outcomes:**

• Rearrange an equation containing multiplication and division to isolate a variable in one step.
• Substitute known values into an equation and solve.
• Solve equations using the cross-product.

**Module Scenario: Triangles**

Kim is working for the JKM Airplane Company and has been selected for an exciting new project, working on JKM’s composite airplane, the Jet-C (C stands for Composites). The Jet-C’s wing section was not built at JKM; it was outsourced. Upon arrival from the subcontractor, the wing section unfortunately didn’t pass the scrupulous tests that the JKM company airplane parts must endure. Specifically, the wings weren’t rigid enough and the wings could bend up too high. The engineers at JKM came up with three different potential designs for a rigid composite brace that could be attached to the inside of the wing. This brace would make the wing rigid enough to make the plane safe to fly.

**Learning Outcomes:**

• Identify and name an angle.
• Measure an angle using a protractor.
• Classify triangles by their angles as right, obtuse, or equilateral.
• Classify triangles by their sides as equilateral, isosceles, or scalene.
• Use the triangle angle sum theorem to determine the measure of an angle in a triangle.
• Determine the measure of an angle by applying the concept of complementary or supplementary angles.

• Identify corresponding sides and angles in similar triangles.

• Determine corresponding angles and sides of similar triangles, using proportions.

• Apply the Pythagorean Theorem to calculate the length of a side of a right triangle.

• Calculate all angles and sides of a right triangle using trigonometry.

Module Scenario: The Cartesian Plane

Joshua, a mechatronics technician, works at an auto plant and his job is to make sure the industrial robotic arms are running at 100% capacity. When Joshua arrives at the plant for his shift, he learns that an industrial robotic arm, specifically a welding arm, isn’t working properly. The robotic arm isn’t extending far enough horizontally (left, right) or vertically (up, down).

Learning Outcomes:

• Describe the layout and identify the quadrants of the Cartesian Coordinate System.

• Given the point on a graph, determine the ordered pair.

• Given a point on a graph, recognize whether an ordered pair is an x or y intercept.

• Graph points on the coordinate plane given an ordered pair.

• Visually identify whether the slope of a line is positive, negative, zero, or undefined.

• Given a line on a graph, determine its slope.

• Given the coordinates of two points, determine the slope of a line, using the slope formula.

• Given the coordinates of two points on a line, determine its linear equation.

• Given a linear equation, graph a line on the coordinate plane.

• Calculate the midpoint between two points on a line.

• Calculate the distance between two points.
**STEM Readiness UNIT 2: Critical Thinking and Workplace Communication**

**Module Scenario: Introduction to Communications and Critical Thinking**

Kelly is a new technician who has just joined the Air Operations Team at ARINC. She will use critical thinking and practice workplace communication in a technical environment. Kelly will learn how to locate and interpret information from flow charts, diagrams, charts, and tables and will analyze information from multiple sources to determine actions required in a given situation.

**Learning Outcomes:**

- Locate and interpret key information from text.
- Locate and interpret key information from flow charts and diagrams.
- Locate and interpret information from a chart or a table.
- Analyze information from multiple sources to determine actions required in a given situation.

**Module Scenario: Oral and Written Communications**

Kelly continues her training in the Air Operations Center and learns to identify key components in an effective summary of information. She practices summarizing information from various sources and learns how to compose effective email communications for various workplace scenarios. Kelly is learning more about ARINC’s communication processes and procedures.

**Learning Outcomes:**

- Identify key components in an effective summary of information.
- Write a summary of a situation with all necessary components.
- Describe the importance of filling in forms completely and accurately.
- Demonstrate the ability to enter information correctly given a specific set of instructions.
- Listen to a conversation and compose a summary of the information.
- Listen to a conversation and determine information needed to complete a summary of the call.
• Analyze information from multiple sources to determine actions required in a given situation.

• Compose effective email communications for various workplace scenarios.

**Module Scenario: The Big Storm**

Kelly and her team apply critical thinking and workplace communication skills to a real life crisis situation. The ARINC team handles a series of incidents as a Big Storm moves up the coast, affecting several different airports along the way.

**Learning Outcomes:**

• Apply critical thinking skills to real life situations and evaluate the outcomes.

**Module Scenario: After Action Reporting**

The ARINC Team will have to prepare a series of after action reports and deliver a presentation to senior management about the events and the team’s response during the Big Storm. Kelly will learn how to write a business memorandum and a short essay and will learn how to create and deliver an effective slide presentation.

**Learning Outcomes:**

• Write an effective purpose statement.

• Compose a professional business memo.

• Write a short essay using proper form.

• Determine most effective layout of information on slides for presentation.

• Describe appropriate public speaking guidelines.

**Module Scenario: Troubleshooting**

Technicians apply a systematic troubleshooting process when they are diagnosing problems with cars, equipment, machinery, and computers every day. Troubleshooting involves applying critical thinking to determine the cause (or probable cause) of a problem and then determining the best course of action to solve that problem. Gary is a mechatronics technician who applies the troubleshooting process to various types of situations on the job.

**Learning Outcomes:**
Apply the general troubleshooting process to various situations.

Module Scenario: Fire on the Production Line

Gary will occasionally encounter larger, more complex problems involving workplace safety issues or extended periods of time when the equipment will not be functioning while they wait for parts to arrive. An equipment fire or major systems breakdown can be a huge problem that can affect the production line and can cost the company a lot of money. Workplace safety is also a huge issue on the job and if there is a workplace incident, Gary will be involved in the investigation and after action safety reporting. If the company did not follow proper safety procedures or if they neglected to perform routine maintenance on the equipment, they could face fines or other sanctions from OSHA. Gary and his fellow mechatronics technician, Joe, will investigate the cause of a fire.

Learning Outcomes:

• Analyze information from multiple sources to determine actions required in a given situation.

STEM Readiness UNIT 3: Professional Skills

Module Scenario: Customer Service

This module will introduce principles of good customer service. The student will review situations to identify various types of employee and customer behaviors, and will determine the most effective strategies and responses for different types of customer service situations.

Learning Outcomes:

• Recognize and explain the general principles of good customer service.

• Identify various types of employee behaviors that contribute to a customer’s positive or negative experience with a company.

• Identify various customer types based on common types of customer behaviors.

• Determine the most effective strategies or responses for various types of customer behaviors.

Module Scenario: Confidentiality
Students will learn how to define confidentiality and identify ways to maintain confidentiality in a variety of situations. The module will also provide important information on appropriate and inappropriate responses to a breach in confidentiality.

Learning Outcomes:

• Define confidentiality and explain why it is important to maintain.
• Identify types of information or data that is confidential.
• Identify common locations where confidential information is stored and transmitted.
• Identify the different ways that cybercriminals attack computers to steal information or ruin computer files.
• Recognize and explain the role of social media as it relates to the workplace.
• Determine the most appropriate action or response to take in order to maintain confidentiality in a variety of situations.
• Distinguish between appropriate and inappropriate responses to a breach in confidentiality.

Module Scenario: Organizational Skills and Time Management

Effective organizational skills and time management are critical workplace skills. Organizational skills involve the ability to identify tasks, determine the steps in a process, put the steps in order, develop a plan, assemble key tools and resources, and execute the plan. Time management is closely linked to organizational skills and involves the ability to allocate the proper amount of time needed for each task and the ability to stick to a schedule. In this module, students will explore some effective ways to improve their organizational and time management skills.

Learning Outcomes:

• Identify tasks to be accomplished and determine the most appropriate way to organize.
• Determine the amount of time needed for each task.
• Determine the steps in a process, place them in order, and develop a plan.
• Evaluate the effectiveness of the organizational plan.

Module Scenario: Teamwork
The ability to work successfully with other co-workers on a team project is a critical workplace skill. Teams are often pulled together to solve a problem or complete a project at a specific point in time. In this module, students will identify the stages of team development, evaluate employee behaviors that positively and negatively affect teamwork, and identify effective strategies for keeping a team on track.

**Learning Outcomes:**

- Describe the benefits of teamwork in the workplace.
- Identify Tuckman’s stages of team development.
- Describe employee behaviors that positively and negatively affect teamwork.
- Recognize and explain the importance of positive interpersonal skills and non-verbal behavior.
- Identify positive leadership behaviors and effective strategies for keeping a team on track.
- Identify strategies for responding to negative team behavior.

**Module Scenario: The Job Search Process**

Students will learn how to conduct a thorough job search, using key resources to help tailor a resume to the type of job that he or she is seeking. They also will practice writing a résumé and an effective cover letter.

**Learning Outcomes:**

- Locate available jobs and match your skills and experience to the requirements.
- Identify types of résumés and purpose for each type: chronological, functional, and combination; and determine which format is most appropriate to use for a particular situation.
- Describe key elements of effective cover letters.
- Create a master application containing all key information needed for job applications.

**Module Scenario: Professional Image**

Students will learn effective strategies to help them prepare for an interview, project a professional image, and conduct that interview with confidence.
Learning Outcomes:

• Describe the process of preparing for an interview.
• Describe types of interviews and specific challenges of each.
• Describe the four stages of the interview.
• Answer common interview questions.
• Develop a plan for following up after an interview.

STEM Foundations

The STEM Foundations course is divided into two main units: Workplace Communication and Math. STEM Foundations consists of twenty-two mini-lessons designed to target foundational skills in math and workplace communications. STEM Foundations is a modularized set of curriculum “bundles,” 12-15 hours of instruction time (intended to be used as part of a course, not a full stand-alone course).

**STEM Foundations UNIT 1: Workplace Communication**

**Module Scenario: Apply Reading Strategies to Improve Comprehension**

Robert is returning to school to study to be a mechatronics technician. He hasn’t been in school in years and is concerned about his reading skills.

Learning Outcomes:

• Identify main idea and supporting details of a text and summarize effectively.
• Apply effective strategies before, during, and after reading to improve comprehension.

**Module Scenario: Demonstrate Ability to Use Sentence and Paragraph Structure Effectively in Writing**

Eva is a mom returning to the workforce. She is training to be an environmental technician. She is good with Math and data but is struggling with the writing assignments and reports required in her courses.

Learning Outcomes:

• Build a paragraph.
• Develop a short essay.
Module Scenario: Develop and Improve Writing Skills

Mark is in cyber technician training and he is learning to write more effectively and professionally.

Learning Outcomes:

• Compose effective email communication.
• Develop and demonstrate a writing process.

Module Scenario: Practice Listening and Speaking Skills

Gus is an intern at EV, Inc. He has to answer phones and summarize and relay messages to appropriate people within the organization. His supervisor has also asked him to help put together a slide presentation about their products for an upcoming auto show.

Learning Outcomes:

• Demonstrate professionalism on the telephone.
• Summarize and relay messages accurately.
• Prepare an effective presentation.

Module Scenario: Demonstrate Effective Time Management Skills

Daniel and Katherine are enrolled in a composites technology program. Students in the program must balance their time between completing their composites work, often checking their pieces during the curing stage; studying; and other tasks.

Learning Outcomes:

• Demonstrate time management and organizational skills for classroom success.

STEM Foundations UNIT 2: Math
MATH FOUNDATIONAL SKILLS

The second part of the course is designed to quickly refresh basic math skills before students begin their technical training.

The Number Line and Integers

Learning Outcomes:
• Use the number line to add integers.
• Use the number line to subtract integers.

**Multiplying and Dividing Integers**

**Learning Outcomes:**

• Multiply integers.
• Divide integers.

**Order of Operations (Multiplication, Division, Addition, Subtraction (MDAS))**

**Learning Outcomes:**

• Explain and employ basic order of operations.
• Demonstrate the commutative property for each operation.

**Fractions**

**Learning Outcomes:**

• Determine the fraction when given specific information.
• Determine equivalent fractions.
• Calculate the greatest common factor (GCF) among fractions.
• Simplify a fraction.
• Add and subtract fractions with unlike denominators.
• Multiply and divide fractions.

**Negative / Signed Values**

**Learning Outcomes:**

• Add signed values including fractions and decimals.
• Commute expressions using Order of Operations (PEMDAS).

**Conceptual Equality**

**Learning Outcomes:**

• Define the concept of a variable.
• Apply the principle of equality.

Adopting and Adapting the Program

Accessing and Utilizing the Online Courses
All STEM Readiness and STEM Foundations content is available for free through Carnegie Mellon University’s Open Learning Initiative (OLI). Students access the content virtually from either OLI’s website directly or through the college’s learning management system. To preview the content, go to http://oli.cmu.edu/teach-with-oli/review-our-free-open-courses/. To access full content, sign up for a free account at www.oli.cmu.edu, and create an OLI course with STEM Readiness or STEM Foundations as the curriculum.

The courses may be used in a variety of ways. Instructors can create a course through their college’s Learning Management System (CANVAS, Blackboard, etc.) by linking to OLI’s Platform+ system. Specific instructions for linking OLI course material to many learning management systems are provided by OLI at http://oli.cmu.edu/teach-with-oli/find-educator-resources/lms-integration/. Instructors also may choose to create a course directly on OLI’s Platform+ system and have their students log in to OLI and utilize a course key for access to that course. OLI also maintains versions of the courses that are accessible directly on OLI’s website with no course key (note that these versions of the course do not include the full course content): http://oli.cmu.edu/learn-with-oli/.

Instructors can customize a particular course by selecting and/or omitting certain modules. For more information on customizing a course, visit: http://oli.cmu.edu/teach-with-oli/

The modules were designed to be used a variety of ways: online only, hybrid, or in a face-to-face class either as the main focus or as a supplement to other materials. The modules may be bundled together and offered as a credit course; a zero-credit, credit equivalent course; or as a non-credit course. The modules also can be used in a stand-alone capacity, wherever they fit into a particular curriculum. For example, the “Teamwork” module in the “Professional Skills Unit” of the STEM Readiness course is being used in Anne Arundel Community College (AACC) science classes before students begin working together on lab projects.

Modules also may be inserted directly into a credit class to support a particular topic. For example, students may complete the “Measuring Systems,” “Beginning Algebra,” or “Triangles” module while they are in a technical class working through curriculum that requires mastery of these particular math skills.
The modules were deliberately designed with flexibility and adaptability in mind. The entire STEM Readiness course was threaded through a GED Prep curriculum during a one semester youth program in fall 2013 at AACC to strengthen skills of students who were getting ready to take the GED. Modules were inserted into the Career, Math, and Business Communication classes in that program to support the face to face instruction that was going on in the classroom and also to more effectively engage students in learning.

The STEM Foundations course modules were developed specifically for use in a “FAST TRACK” boot camp style intensive program designed to help lower level students quickly build key math and workplace communication over a 9 -12 week period before they entered credit STEM certificate programs. Classes were offered in full-day, four days per week, face-to-face class schedules with intensive focus on development of math skills and workplace communication skills. The STEM Foundations materials were inserted as needed to support development of key foundational skills in these areas.

**Equipment and Classroom Space**

STEM Readiness and STEM Foundations courses can be taught as face-to-face, hybrid, or online courses. If classroom space is required, students should have access to computers with high-speed internet to access the OLI content.

**Personnel**

STEM Readiness and STEM Foundations courses can be taught using either full-time or adjunct faculty.

The first unit in STEM Readiness, Math, should be taught by a math or math education instructor who is comfortable with students that move through content at different paces. After students complete the STEM Readiness math placement test, each student’s path to course completion will vary. The instructor must be adept in flexible lesson plans and working with small groups of students based on their individual content needs.

The second STEM Readiness unit, Critical Thinking and Workplace Communications, is best taught by an instructor with a problem-solving, business background and deep knowledge of the career field which students intend to enter. This content is most impactful when it is heavily integrated into a student’s future career setting.

The third STEM Readiness unit, Professional Skills, is best taught by an instructor with a background in human resources, hiring, or workforce development. The focus of this course content includes résumé writing, professionalism, teamwork, customer service, interviewing
and other topics. The instructor must be able to speak knowledgeably regarding current résumé trends in the students’ career fields, critique and edit student résumés, and instruct students on the proper etiquette and art of interviewing.

STEM Foundations content should be taught by instructors familiar with developmental math and reading teaching methods and content.

Course Scheduling
STEM Readiness courses should be offered to students in addition to their technical coursework. NSC students take the STEM Readiness Math unit in their first academic term, and subsequently take the second and third units of STEM Readiness content. The third unit of STEM Readiness, Professional Skills, is typically offered in either the last or second to last academic term, as it focuses on preparing students for employment interviews. The precise timing of the offering of the units will vary based on college academic calendars, faculty loading limitations, and classroom availability.

About These Materials

Using These Materials
This work is licensed under a Creative Commons Attribution 4.0 International License, as described in the “License” section below. The CC-BY 4.0 license allows adopting instructors to reuse, revise, remix, and redistribute materials following the guidelines in the “Copyright” and “Attribution and Citation” sections below.

Copyright
© 2015 by the National STEM Consortium.

The National STEM (Science, Technology, Engineering, and Mathematics) Consortium (NSC) is a collaborative of ten colleges in nine states, funded by a Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the U.S. Department of Labor to develop new certificate training programs in technical fields.

For more information about NSC, visit the NSC website: http://www.nationalstem.org.

License
Unless otherwise specified, this work is licensed under a Creative Commons Attribution 4.0 International License.
Attribution and Citation
To attribute this work use the name of the authors: Janet Paulovich and Kim Law.

To cite this work, use:


Accessibility
The NSC has made every effort to create accessible materials, following best practices and Americans with Disabilities Act (ADA) guidelines. For example, to ensure screen reader systems can work with these materials, we write using plain English, heading styles in outline structure, simple layout, minimal tables and charts, bulleted and numbered lists, high-contrast colors, standard fonts, white space for ease of reading, and so on. For more information about ADA compliance, see the 2010 Design Standards on the ADA website: [http://www.ada.gov/2010ADASTANDARDS_INDEX.HTM](http://www.ada.gov/2010ADASTANDARDS_INDEX.HTM).

Disclaimer
This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warrantees, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.