



Necessary Skills Now

The **Necessary Skills Now** project worked with teams of faculty and employers to develop curriculum that **integrates technical content and employability concepts within existing courses** in cybersecurity and advanced manufacturing. These resources are available for download now!

CYBERSECURITY	ADVANCED MANUFACTURING
<p>Project 1. Product Analysis</p> <p>Students 1) make product selection recommendations in light of known threats and vulnerabilities 2) using the <i>Common Vulnerabilities and Exposures (CVE) Details</i> website. Each team 3) analyzes known vulnerabilities of three products (e.g., Google Chrome, Wordperfect, Microsoft Outlook), and 4) delivers a presentation summarizing their findings and recommendations.</p> <p>Applicable courses: Security+</p> <p>Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications</p> <p>Estimated time required: 2 hours</p>	<p>Project 1. Batch Mix System for Polyisocyanurate Foam Insulation</p> <p>Student teams 1) use flow charting and mind mapping to create a control diagram and program for a new batch mix process described in the scenario, 2) apply a design methodology (IDEAL), while 3) documenting and presenting their work and data.</p> <p>Applicable courses: Intro to PLC Programming, Intro to Programmable IC Controllers, Intro to C++ Programming, LABVIEW (or similar)</p> <p>Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications, Dependability/Work ethic, Planning and organizing</p> <p>Estimated time required: 3-4 class sessions</p>
<p>Project 2. Incident Response</p> <p>Student teams 1) review an organization’s incident response policies, procedures, frameworks, roles/responsibilities, and then 2) analyze the findings to 3) develop an incident response questionnaire. Using their form, they 4) complete an investigation of an incident and 5) report on an incident.</p> <p>Applicable courses: Security+</p> <p>Employability skills addressed: Teamwork, Problem solving, Written communications</p> <p>Estimated time required: 1-2 hours</p>	<p>Project 2. Building a Drone</p> <p>Student teams use a kit to complete several phases that include 1) design, 2) building, and 3) safe testing of a working (flying) drone capable of performing real-time inspections of inaccessible locations. The project concludes with 4) a formal presentation.</p> <p>Applicable courses: Intro to Electronics, Solidworks Fundamentals, Industrial Safety, Intro to Quality, Materials and Process 1, Intro to Machining, Soldering</p> <p>Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications, Dependability/Work ethic, Planning and organizing.</p> <p>Estimated time required: 4 months</p>

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CYBERSECURITY

Project 3. Security Awareness Campaign

Student teams 1) examine existing security awareness programs using web research of actual organizations, and 2) develop a survey to measure awareness of the issues found in their research, to query employees of a fictitious organization. Students then plan, develop, and present the details for an awareness campaign to address select initiatives listed by the company CISO.

Applicable courses: Security Awareness, Cybersecurity Essentials, Security+

Employability skills addressed: Teamwork, Verbal communications, Dependability/Work ethic, Planning and organizing

Estimated time required: 1-2 hours

Project 4. Security Policies

Student teams 1) examine the purposes for an organization's information security policies, and 2) identify the differences between policies, standards, guidelines, and procedures. Students then 3) create information security policies to mitigate existing vulnerabilities exposed by a third-party audit.

Applicable courses: Security+

Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications

Estimated time required: 2 hours

Project 5. Physical Security

Student teams respond to a request from the school administrator for 1) a plan to address the physical security of their student-run datacenter, which 2) includes a classroom network supporting 3) coursework and 4) security-based competitions, and 5) addresses the need to support remote access.

Applicable courses: Cybersecurity Essentials, Security+, Network Security

Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications

Estimated time required: 2 hours

ADVANCED MANUFACTURING

Project 3. Statistical Quality Control

Students work in teams 1) serving as project technicians, working through four stages of activity to 2) measure and validate data from actual packaging materials (either purchased or supplied by a partner employer).

Applicable courses: Quality Control, Production/processes, Metrology, Rapid prototyping, Supply chain

Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications, Dependability/Work ethic, Planning and organizing

Estimated time required: 10-15 hours

Project 4. Design/Production of a BMX Bicycle Pedal

Student teams 1) complete the design and apply basic quality control to 2) manufacture BMX bike pedals, with stages involving 3) CAD/CAM tools, 4) CNC programming and operation, 5) QC measurements and analysis involving statistical quality control, and then 6) deliver a presentation of the design and test results.

Applicable courses: Intro to AutoCAD, Fundamentals of Engineering, courses in Advanced Technology, Manufacturing, and Quality Control

Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications, Dependability/Work ethic, Planning and organizing

Estimated time required: 10-12 hours

Project 5. Puzzle It Out

Student teams develop and execute production processes and procedures over several stages to 1) plan, 2) manufacture, and 3) assemble aluminum 6-piece Burr puzzles, teams typically 4) cooperate to manage and schedule limited equipment, and finally 5) present the production plans and results.

Applicable courses: Manual and/or CNC Milling, Blueprint Reading, Metrology, Intro to Mfg Engineering, Mfg Quality, Intro to LEAN Mfg

Employability skills addressed: Teamwork, Problem solving, Verbal and Written communications, Dependability/Work ethic, Planning and organizing

Estimated time required: 10-20 hours (depending on number of teams and available machines)