

**The Scholarship of Teaching
The CEET Initiative on Teaching & Learning
Instructional Design Process Map**
(Scarborough, J.D. 2008)

Use in conjunction with:

*The Scholarship of Teaching
Reflective Practice
CEET's Faculty Development Program Model
Systematic Instructional Design
"Intentional and Reversed"*
(Scarborough, J.D. 2008)

&

*Strategic Alliance to Advance Technological Education through Enhanced Mathematics, Science, Technology
& English Education at the Secondary Level*
(Scarborough, 2004)

(Dick & Carey, 1996; Wiggins & McTighe, 2005, 1995;
Deming Quality Cycle, 1950's)

<p>A. ABET/NAIT Outcomes ISBE Considerations: I. Engineering Rich Content–Context II. Career Awareness, ID, Professional Preparation Pathways</p> <p>(1)Engineering (A-K), (listed first in order A-K)</p> <p>(2) Engineering Technology & (3) Industrial Technology</p> <p>*2-3combined as A- Q Outcomes (listed following ENG, aligned with A-K ENG.; not in alphabetical order)</p> <p>(4) Embedded NIU Gen. Ed. Goals shown for ABET/NAIT</p> <p>(1)Choose ABET/TAC/NAIT Outcomes appropriate for course</p> <p>(Refer to and use information in A. handouts and reference)</p>	<p>B. Illinois State Learning Goals – Benchmarks K-12 III. Teacher Leadership</p> <p>(1) Select and write in ISBE Learning Goals Specific to your course.</p> <p>(2) Align with ABET/NAIT Outcomes in column A.</p> <p>(Refer to and use information in B. handouts and references)</p>	<p>C. Learning Goals & Outcomes Knowledge Priority III. Teacher Leadership Ca. Course Objectives, Goals or Outcomes (CO, CGs or COs) Cb. Student Learning Outcomes (SLOs) K-12 <u>Specific Course Title (here):</u></p> <p>(1)Write Course Objs./Goals/ Outcomes.</p> <p>(2) Write specific Student Learning Outcomes below each course CO/CG/CO.</p> <p>(3) Align with ISBE Goals, Benchmarks</p> <p>(4) (KP) Identify Knowledge Priorities a. (BI) (CT)Big Ideas/Core Tasks b. (IK) Important to Know c. (W) Worth being familiar with (Wiggins & McTighe, 2005)</p> <p>(5) Develop Syllabus using template.</p> <p>(Refer to and use information in B. handouts and references & EXAMPLE below)</p>	<p>D. Pedagogy Analyses IV. 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Make sure that the assessment strategies and each item number links or maps back to specific outcomes.</p> <p>(Kuhs, 2001; Scarborough., 2006)</p> <p>(Complete attached worksheet; summarize items by strategy/number here; Refer to-use information in E. handouts-references)</p> <table border="1"> <tr> <th>Strategies I-XII+ XIII TBD Value %s</th> <th>Rubric Item #s</th> </tr> </table>	Strategies I-XII+ XIII TBD Value %s	Rubric Item #s	<p>F. Bloom Cognitive Dimension</p> <p>IV. Pedagogy Factors</p> <p>1. Identify (/) each level of Bloom’s Cognitive Dimension achieved by each Student Assessment strategy and item.</p> <p>2. 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<p>A. Apply knowledge of math, science, engineering</p> <p>B. Apply current knowledge and adapt to emerging applications of math, science, engineering, and technology.</p> <p>NIU Gen Ed Goals- Students: <i>a. develop habits of writing, speaking, and reasoning necessary for continued learning.</i> <i>a.i. communicate clearly in written English, demonstrating ability to comprehend, analyze, and interrogate critically</i> <i>a.iii. perform basic computations, display facility with use of formal and quantitative reasoning analysis and problem solving, and interpret mathematical models and statistical information.</i></p>	<p>Science (partial 11-13) Goal 11 – Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems. PERFORMANCE CRITERIA Goal 12 – Understand the fundamental concepts, principles, and interconnections of the life, physical, and earth/space sciences. Mathematics (partial list 8B-10C) Goal 8B - ...interpret and describe numerical relationships using tables, graphs, symbols. PERFORMANCE CRITERIA Goal 8C...solve problems using systems of numbers and their properties. Technology Education (partial list 1-10) STANDARD 1 The competent technology education teacher understands the foundations of work, the career development process, occupational skill standards, and workplace skill requirements. Knowledge Indicators - The competent technology education teacher: 1A.understands the history, organization, and future of work and how work relates to needs and functions of the economy and society. Performance Indicators - The competent technology education teacher: 1D.relates workplace cultural expectations to workplace skills. Technology Standards for Teachers (partial list 1-8) STANDARD 1 - Basic Computer/Technology Operations and Concepts The competent teacher will use computer systems to run software; to access, generate, and manipulate data; and to publish results. He or she will also evaluate performance of hardware and software components of computer systems and apply basic troubleshooting strategies as needed Knowledge Indicator - The competent teacher: 1A.understands how to run computer software; access, generate and manipulate data; and publish results. Performance Indicators - The competent technology education teacher: 1D.relates workplace cultural expectations to workplace skills. Literacy-Illinois Learning Standards Goal 1 - Reading Goal 2 - Literature Goal 3 - Writing Goal 4 - Listening/ Speaking Goal 5 - Research</p>	<p>KPs - % BI ___%</p> <p>Course Outcome 1 -Student Learning Outcome 1</p> <p>- Student Learning Outcome 2...</p> <p>Course Outcome 2 - Student Learning Outcome 1</p> <p>-Student Learning Outcome 2...</p> <p>Course Outcome 2 - Student Learning Outcome 1</p> <p>-Student Learning Outcome 2...</p> <p>Course Outcome 2 - Student Learning Outcome 1</p> <p>-Student Learning Outcome 2...</p> <p>IK ___%</p> <p>W___%</p>	<p>Bloom Knowledge: ___ Factual Knowledge ___ Conceptual Knowledge ___ Procedural Knowledge ___ Meta-Cognitive Knowledge</p> <p>Knowledge Sources: ___ Text ___ Professor ___ Expert ___ Field Experience ___ Internet ___ Other</p> <p>Bloom’s Cognitive ___ Knowledge – Remember ___ Comprehension –Understand ___ Application - Apply ___ Analysis – Analyze ___ Synthesis – Evaluate ___ Evaluate – Create</p> <p>Gardner’s Multiple Intelligences ___ Verbal-linguistic ___ Logical-mathematical ___ Spatial ___ Musical ___ Bodily-Kinesthetic ___ Intra-personal (team/group) ___ Interpersonal (individual)</p> <p>Prior Knowledge Identify briefly by discipline: Science Math Technology Ed. Technology Literacy Skills</p> <p>Integration Models: ___ Connected ___ Sequenced ___ Nested ___ Shared ___ Webbed ___ Threatened ___ Integrated ___ Networked ___ Immersed</p> <p>Course Balance: Course is centered on: ___ a. knowledge ___ b. assessment ___ c. teacher ___ d. learner (student) ___ e. balanced (reveal in syllabus)</p>	<p>I. Portfolios (___ %) II. Field Activities (___ %) a. Interviews - Expert Inquiry b. Tours c. Internships d. Shadowing e. Projects f. Career Plan g. Career ID Study h. Career Preparation Plan III. Graphing (___ %) a. flowcharts b. concept mapping c. others IV. Information Research (%) a. Literature Studies c. Case Studies d. Learning Papers e. Internet Studies V. Problem based Tasks (%) a. Performance Tasks 1. design problems/tasks 2. technical 3. technological b. Observable Behaviors 1. individual 2. team VI. Technical Research(___ %) a. Experiments b. Quasi-experiments c. Pilots, fieldtests d. Evaluation VII. “Minute” Papers (___ %) VIII. Critical Reflection a. Journals b. Logs c. Questionnaires VIII. Technical Projects(%) IX. Conceptual Projects X. Presentations (___ %) XI. Tests (___ %) a. short answer b. essay c. problem d. selected response 1. multiple choice 2. matching 3. true/false XII. Leadership Community Service Projects (___ %) XIII. Others TBD by Teachers (___ %)</p>	<p>(copy each one as needed)</p> <p>___ Knowledge-Remember ___ Comprehend-Understand ___ Application – Apply ___ Analysis – Analyze ___ Synthesis – Evaluate ___ Evaluate – Create</p> <p>___ Knowledge – Remember ___ Comprehend – Understand ___ Application – Apply ___ Analysis – Analyze ___ Evaluate – Create</p>	<p>(copy each one as needed)</p> <p>P Passive I Intermediate A Active</p> <p>___ Knowledge – Remember ___ Comprehend – Understand ___ Application – Apply ___ Analysis – Analyze ___ Evaluate – Create</p>	<p>Primary Choices: Inquiry PBL Guided Discovery Cooperative Learning... 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<p>B. Design and conduct experiments; analyze and interpret data</p> <p>C. Conduct, analyzes, and interprets experiments; apply experimental results to improve processes.</p> <div data-bbox="84 1065 359 1321" style="border: 1px solid black; padding: 5px;"> <p>NIU Gen Ed Goals - Students: a.iii. perform basic computations, display facility with use of formal and quantitative reasoning analysis and problem solving, and interpret mathematical models and statistical information</p> </div> <div data-bbox="84 1359 359 1701" style="border: 1px solid black; padding: 5px;"> <p>Gen Ed Goals - Students: b. develop an ability to use modes of inquiry across a variety of disciplines in the humanities and the arts, the physical sciences and mathematics, and social sciences. b.iv. demonstrate an ability to use scientific methods and theories to understand the phenomena studied in the natural and social</p> </div>										

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<p>C. Design a system, component, process to meet desired needs within realistic constraints (e.g., economic, environmental, social, political, ethical, health, safety, manufacturability, & sustainability).</p> <p>D. Ability to apply creativity in the design of systems, components, or processes appropriate to program objectives</p> <p>NIU Gen Ed Goals - Students: <i>c. develop an understanding of the relatedness of various disciplines by integrating knowledge from several disciplines and applying that knowledge to an understanding of important problems and issues.</i></p>										

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<p>D. Function on multi-disciplinary teams.</p> <p>E. Function effectively on teams.</p> <div style="border: 1px solid black; padding: 5px;"> <p>NIU Gen Ed Goals-Students: <i>b.iii. demonstrate a knowledge of cultural traditions and philosophical ideas that have shaped societies, civilizations, and human self-conceptions.</i> <i>d. develop social responsibility and preparation for citizenship through global awareness, environmental sensitivity, and an appreciation of cultural diversity.</i></p> </div>										

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<p>E. Identify, formulate, and solve engineering problems.</p> <p>F. Identify, analyze, and solve technical problems.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Gen Ed Goals - Students:</p> <p><i>b. develop an ability to use modes of inquiry across a variety of disciplines in the humanities and the arts, the physical sciences and mathematics, and social sciences.</i></p> <p><i>b.iv. demonstrate an ability to use scientific methods and theories to understand the phenomena studied in the natural and social sciences.</i></p> </div>										

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<p>F. Understand professional and ethical responsibility</p> <p>J. Understand professional, ethical, and social responsibilities.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NIU Gen Ed Goals - Students: <i>d. develop social responsibility and preparation for citizenship through global awareness, environmental sensitivity, and an appreciation of cultural diversity.</i></p> </div>													

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<p>G. Communicate effectively</p> <p>G. Communicate effectively in writing.</p> <p>H. Communicate effectively orally.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NIU Gen Ed Goals - Students: <i>a. develop habits of writing, speaking, and reasoning necessary for continued learning.</i> <i>a.i. communicate clearly in written English, demonstrating ability to comprehend, analyze, and interrogate critically.</i> <i>aii. communicate in a manner that unites theory, criticism, and practice in speaking & writing.</i></p> </div>										

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<p>H. understand impact of engineering solutions in a global economic, environmental, societal context</p> <p>K. Respect for diversity and a knowledge of contemporary professional, societal, and global issues.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NIU Gen Ed Goals - Students: d. develop social responsibility and preparation for citizenship through global awareness, environmental sensitivity, and an appreciation of cultural diversity.</p> </div>										

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<p>I. Recognize the need for, and have capability to engage in life long learning.</p> <p>I. Recognize the need for, and an ability to engage in life long learning.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NIU Gen Ed Goals - Students: a.iv. are able to access and use various information sources. Internet, text, and field case.</p> </div>										

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<p>J. knowledge of contemporary issues</p> <p>NIU Gen Ed Goals - Students: <i>d. develop social responsibility and preparation for citizenship through global awareness, environmental sensitivity, and an appreciation of cultural diversity.</i></p>													

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<p>K. Use techniques, skills, and modern engineering tools necessary for engineering practice.</p> <p>A. Mastery of knowledge, techniques, skills, modern tools of disciplines.</p> <p>L. Commitment to quality, timeliness, and continuous improvement.</p> <p>M. Ability to program computers and/or utilize computer applications effectively</p> <p>N. Ability to use modern laboratory techniques, skills, and/or equipment effectively.</p> <p>O. Ability to manage projects effectively</p> <p>P. Ability to design, manipulate, and manage industrial systems.</p> <p>Q. Ability to manage or lead personnel effectively.</p> <p>NIU Gen Ed Goals - Students: c. develop an understanding of the interrelatedness of various disciplines by integrating knowledge from several disciplines and applying that knowledge to an understanding of important problems and issues.</p>										