

Table B.5.b.3.1: GAPS Analysis Summary

(+ means OK, C means may be Considered in future)

Standards ABET-Engineering

| | | | | | | | | | | |
|-------------------------------------|--|--|--|--|--|---------------------------------------|---|---|-------------------------------------|--|
| a. apply math, science, engineering | b. design/conduct experiments; analyze, interpret data | c. design system, component, process-given constraints, etc. | d. function on interdisciplinary teams | e. identify, formulate, solve engineering problems | f. understand professional, ethical responsibility | g. ability to communicate effectively | h. undst. impact eng. Sol global, economic, evnir., society | i. recognition of need for, and ability to engage in life-long learning | j. Knowledge in contemporary issues | k. ability to use techniques, skills, and modern engineering tools |
| + | + (not much design of expt) | C (only to small extent is done now) | C | + | C | + (so far only written reports) | c | C (only to small extent is done) | + | + |

Standards ABET/TAC/NAIT-Engineering Technology and Industrial Technology

| | | | | | | | | | | | | | | | | |
|---|--|--|--|---|---|---|--|---|---|---|--|--|---|---|---|--|
| a. mastery of knowledge, techniques, skills, modern tools | b. ability to apply current knowledge; adapt to emerging applications of math, science, technology | c. ability to conduct, analyze, interpret experiments; apply experimental results to improve processes | d. ability to apply creativity in design of systems, components, processes | e. ability to function effectively on teams | f. ability to identify, analyze, solve technical problems | g. ability to communicate effectively writing | h. ability to communicate effectively orally | i. recognize need for, ability to engage in lifelong learning | j. ability to understand professional, ethical, social responsibilities | k. respect for diversity; knowledge of contemporary professional, societal, global issues | l. commit to quality, timeliness, continuous improvement | m. ability to program computers and/or use computer applications effectively | n. ability to use modern laboratory techniques, skills, equipment effectively | o. ability to manage projects effectively | p. ability to design, manipulate, manage industrial systems | q. ability to manage or lead personnel effectively |
| | | | | | | | | | | | | | | | | |

NIU General Education

| | | | | | | | | | | |
|-----------------|----------|-----------|------------------------|-----------------------------|-----------------------------------|----------------------|---|---|-------------------------------------|--------------------------------------|
| Writing | Speaking | Listening | Quantitative Reasoning | Use of Resources-Technology | Historical Development Of Culture | Significance of Arts | Cultural Traditions Philosophical Ideas | Methods in Science Methods in Social Science | Interrelatedness Across Disciplines | Social Responsibility Citizenship |
| Only lab rep. c | c | c | + | + | | | | | | |

Student Learning Objectives/Outcomes & Teaching Models

| Objectives | Mem | Prog Part | Adv O | Le c | Re c Tch | Mas t Learn | Coop Learn | Graph ic Org | Conce pt Attain m | Conc For m | Conc Pres | Con- ceptua l | Induct | Deduct | Inquiry | Sim- ulate | JurisP | Dire ct Instr | Trai n | Synec t | Psycho- motor |
|---|-----|-----------|-------|------|---------------|----------------|------------|---------------|-------------------|---------------|-----------|---------------|--------|--------|----------------|---------------|--------|---------------|--------|---------|---------------|
| To learn basic theories behind vibrating mass or equipment | c | c | + | + | c | + | c | + | c | c | c | + | c | c | c | c | c | + | + | c | |
| To familiarize with various equipment and software used to run experiment | c | c | + | + | c | c | + | c | c | c | c | c | c | c | c | c | c | + | + | c | |
| To perform experiment to verify theories | c | c | + | + | c | C (minimal ly) | c | C (minimally) | c | C (minimally) | c | c | c | c | c | C (minimally) | c | + | + | c | c |
| To learn how to write a laboratory report | c | c | c | + | c | c | + | + | c | c | c | c | c | c | C (minimal ly) | c | c | + | + | c | |
| To apply major commercially available mathematical and engineering software | c | c | + | + | C (minimally) | c | + | + | c | c | c | + | c | c | C (minimal ly) | C (minimally) | c | C (minimally) | c | c | |
| To design structures where failure from vibration is prevented | c | c | + | + | c | c | c | c | C (minimally) | c | c | + | c | c | + | c | c | c | c | c | |

Student Learning Objectives/Outcomes & Teaching Styles

| Objectives | Command | Practice | Reciprocal | Self-Check | Inclusion | Guided Discovery | Convergent Discovery | Divergent Production | Learner Designed | Learner Initiated | Self Teaching |
|---|---------|----------|------------|--------------------------|-----------|------------------|----------------------|----------------------|------------------|-------------------|---------------|
| To learn basic theories behind vibrating mass or equipment | + | + | c | C(only minimally) | c | + | c | C (minimally) | c | c | c |
| To familiarize with various equipment and software used to run experiment | + | + | + | c | c | + | c | C(minimally) | c | c | c |
| To perform experiment to verify theories | + | + | + | c | c | + | c | c | c | c | c |
| To learn how to write a laboratory report | + | + | + | c | c | c | c | c | c | c | c |
| To apply major commercially available mathematical and engineering software | + | + | + | c | c | + | c | c | c | c | c |
| To design structures where failure from vibration is prevented | + | + | c | c | c | + | c | C (minimally) | c | c | c |

Student Learning Objectives/Outcomes & Learning Styles

| Objectives | Concrete Experience | Abstract Conceptualization | Active Experimentation | Reflective Observation |
|---|----------------------|----------------------------|------------------------|------------------------|
| To learn basic theories behind vibrating mass or equipment | C (minimally) | + | + | c |
| To familiarize with various equipment and software used to run experiment | + | + | c | c |
| To perform experiment to verify theories | C (minimally) | + | + | C (minimally) |
| To learn how to write a laboratory report | c | + | c | C |
| To apply major commercially available mathematical and engineering software | + | C (minimally) | + | C |
| To design structures where failure from vibration is prevented | C | + | c | C (minimally) |

Student Learning Objectives/Outcomes & Bloom & Dale

| Objectives | Dale's Cone Levels P A A+ | Knowledge Remember | Comprehension Understand | Application Apply | Analysis Analyze | Synthesis Evaluate | Create | Critical Thinking Level L M H |
|---|--|-------------------------------|-------------------------------------|------------------------------|-----------------------------|-------------------------------|---------------|--|
| To learn basic theories behind vibrating mass or equipment | | | | + | C (minimally) | | | M |
| To familiarize with various equipment and software used to run experiment | | | + | | | | | L |
| To perform experiment to verify theories | | | + | | | | | M |
| To learn how to write a laboratory report | | + | | | | | | L |
| To apply major commercially available mathematical and engineering software | | | | + | | | | M |
| To design structures where failure from vibration is prevented | | | | | | + | | H |