**Outcome CS-k.** Have knowledge of mathematics through differential and integral calculus, discrete mathematics and probability and statistics.

The assessment is performed with respect to the key abilities that the students are expected to acquire in specific courses that have been identified with respect to this outcome.

<table>
<thead>
<tr>
<th>Course</th>
<th>Performance indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 220</td>
<td>Understand Mathematical Logic, especially First Order Logic.</td>
</tr>
<tr>
<td>CS 220</td>
<td>Use proof techniques such as Mathematical Induction and Contradiction.</td>
</tr>
<tr>
<td>CS 220</td>
<td>Understand the mathematics of recurrences.</td>
</tr>
<tr>
<td>CS 220</td>
<td>Develop an understanding of counting, functions, and relations.</td>
</tr>
</tbody>
</table>

**Tools used:** Embedded Course assessments and Graduating Senior Survey

**Data Collection:** Embedded Course Assessments, Student Grades, and Senior Exit Survey responses.

**Frequency of data collection:** The data are collected every time courses are taught.

**Data Analysis:** Every course evaluated by embedded assessments every 4th offering if offered twice an academic year, 3rd offering if offered once an academic year and every other offering if offered less than every academic year.

**Closing the loop:** This outcome is subject to review every year based on performance criteria and metrics and specific action items are developed, if necessary, to revise the content of the courses. The analyzed data are presented to the CS curriculum committee which considers the results.
Performance criteria and metrics:

a) Embedded course assessments administered in CS 220 with average grades \( \geq C \) on assignments and test which cover the performance indicators.

b) Evaluate final grades in MATH 155 (153/154), 156, 251, and STAT 215 with grade of C or better.
Assessment Tool:

Undergraduate In-Course Program Outcomes Assessment Form
Lane Department of Computer Science and Electrical Engineering  
Undergraduate In-Course Program Outcomes Assessment Form

Course: ___________  Semester: _______  Instructor: _______

Assessment of student preparedness for this course at the start of this term:

<table>
<thead>
<tr>
<th>At the beginning of this term:</th>
<th>Nearly 100%</th>
<th>About 75%</th>
<th>About 50%</th>
<th>About 25%</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students had the prerequisite <strong>math</strong> skills.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Students had the prerequisite <strong>laboratory</strong> skills.</td>
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<tr>
<td>3. Students had the prerequisite <strong>problem solving</strong> skills.</td>
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<tr>
<td>4. Students had the prerequisite <strong>design</strong> skills</td>
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<tr>
<td>5. Students were capable of using the necessary <strong>tools</strong> (e.g. hardware/software, etc.)</td>
<td></td>
<td></td>
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<tr>
<td>6. Students had the necessary <strong>programming</strong> skills.</td>
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<tr>
<td>7. Students had the necessary <strong>communication</strong> skills.</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Learning Outcomes * (assessed within course)</th>
<th>How/Where Assessed**</th>
<th>Student Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min Pass %</td>
<td>High Score %</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Indicate which program outcome each course outcome maps into.  
** For example “exam 1, problem 1”  
*** For Grade give the class average on an “A=4.0, B=3.0” basis.

**Recommendations:** Include which outcomes require more attention within the course to improve student performance, and how the course should be altered in the future to improve results.
Assessment Tool:

Graduating Senior Survey
This portion of the survey asks for contact information regarding alumni events and news. Information from this part will be kept separate from the rest of the survey.

**Personal Information:**

Name ______________________________________________

New Mailing Address ______________________________________________

Permanent Address (if different) ______________________________________________

Email address (permanent) ______________________________________________

Phone number ______________________________________________

Degree Earned ______________________________________________

Department ______________________________________________

**Employer Information:**

Name of Employer ______________________________________________

Job Title ______________________________________________

Address ______________________________________________

Country ______________________________________________

Phone Number ______________________________________________

Additional Information ______________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
WVU Benjamin M. Statler College of Engineering and Mineral Resources
Graduating Senior Survey 2014/15

Please provide the following information. All responses in this part of the survey will be kept confidential, and only aggregate data is used in reporting.

Graduation Month: Dec / May / Aug

Major (check all that apply):
____ Aerospace Engineering  ____ Computer Science  ____ Petroleum and Natural Gas Engineering
____ Biometric Systems  ____ Electrical Engineering  ____ Biomedical Engineering
____ Chemical Engineering  ____ Industrial Engineering  ____ Geology
____ Civil Engineering  ____ Mechanical Engineering  ____ Other:__________________
____ Computer Engineering  ____ Mining Engineering

Overall GPA: ______ / 4.0  Gender: M / F  Home State/Country: ______________________

Race/Ethnicity:  ____ African-American  ____ Hispanic  ____ Caucasian  ____ Other
____ Asian-American  ____ Native American  ____ Foreign National

For Race/Ethnicity, please select all that apply. If you are an international student, please select Foreign National.

1. Please mark each program(s) that you participated in during your undergraduate studies.
   a. ___ Co-op;  b. ___ Internship;  c. ___ Study abroad;  d. ___ Service Learning;  e. ___ Undergraduate Research
2. If you've participated in any of the above activities in question 1, please list the organization(s) and location(s):
   ______________________________________________________________________________________
   ______________________________________________________________________________________
   ______________________________________________________________________________________
3. How long ago did you begin the job/graduate school search process?
   __ <3 months;  ___ 3-6 months;  ___ 6-9 months;  ___ >9 months
4. Which of the following best describes your immediate employment/education status following graduation?
   ___ a. I do not plan to work in my field or continue my education. (Please complete the other side of this form)
   ___ b. I am still interviewing/searching for a job or graduate school. (Please complete the other side of this form)
   ___ c. I have a job offer(s) but have not yet accepted. (Please complete the other side of this form)
   ___ d. I have been accepted into graduate school. (Please go to question 5)
   ___ e. I have accepted a job position in my professional area. (Please go to questions 6 through 10)

5. University Name: ________________________________________________________________
   a. Program: ___ MS ;   ___ Ph.D.;   ___ Professional Degree   ___ MBA;   ___ MD;   ___ DDS;   ___ Law
   b. Were you offered an assistantship/fellowship/etc?   ___ Yes;   ___ No;
   c. If you have an assistantship, my monthly stipend is: __ < $1,000  ___ $1,000-1,500  ___ $1,500-2,000
      ___ $2,000-2,500  ___ $2,500+

   Please complete the other side of this form

6. My employer's name is __________________________

7. My employer's business is best described as __________
   F. Government/military  G. Healthcare  H. Manufacturing  I. Service  J. Other
8. My employment is located in: ____ WV;  ____ MD;  ____ NJ;  ____ NC;  ____ OH;  ____ PA;  ____ VA;  ____ Other
    If other, please specify where: ______________________________
9. My starting annual salary is approximately (in units rounded to the nearest $1000):
   ___ < $30k;  ___ $30-34k;  ___ $35-39k;  ___ $40-44k;  ___ $45-49k;  ___ $50-54k;  ___ $55-59k;  ___ $60-64k;
   ___ $65-69k;  ___ $70-74k;  ___ $75-79k;  ___ $80-84k;  ___ $85-89k;  ___ $90-94k;  ___ $95-99k;  ___ $100k+

   Please complete the other side of this form
To help the assessment activities of the college and your major we ask that you take a few minutes to provide us feedback on your perception of how your undergraduate program prepared you in a number of important educational outcome areas. *All entries will be treated as confidential.*

Please give your assessment for items “a” through “q” and “r”, if it applies, using the following rating scale.

5 -strongly agree; 4 -agree; 3 -neutral; 2 -disagree; 1 -strongly disagree; N/A –not applicable (for r. i. & ii.)

10. Through the education and training I attained with my baccalaureate degree I have acquired the knowledge, skill or ability to:

a. ____ Use the basic principles and practices of my engineering discipline
b. ____ Recognize available opportunities and need to pursue continuing education and lifelong learning
c. ____ Apply knowledge of mathematics to solve equations or systems of equations necessary for the solution of engineering problems
d. ____ Apply knowledge of chemistry and physics effectively in solution of engineering problems
e. ____ Design and conduct experiments relevant to the needs of my engineering discipline
f. ____ Acquire, analyze and interpret data and information relevant to the needs of my engineering discipline
g. ____ Design a component, system, or process to meet desired engineering outcomes and needs
h. ____ Function on multidisciplinary teams to manage engineering projects
i. ____ Translate a general problem description into a specific engineering approach
j. ____ Understand professional and ethical responsibilities of a professional engineer
k. ____ Effectively communicate my ideas, recommendations, etc. to others verbally
l. ____ Effectively communicate my ideas, recommendations, etc. in memos, reports, etc.
m. ____ Appreite the impact of engineering from multi-cultural and global perspectives

n. ____ Appreciate my engineering discipline’s impact on contemporary environmental and societal issues
o. ____ Conduct economic evaluation of importance cost factors in engineering designs
p. ____ Recognize the impact of engineering design on worker or public safety
q. ____ Utilize software to solve problems relevant to the needs of engineers practicing my discipline in industry
r. ____ If you transferred to WVU from another institution or department how would you agree with the following statements:
   i. ____ The procedure for accepting my transfer was relatively seamless and straight forward
   ii. ____ The procedure for validating credit for courses taken elsewhere was efficient

**COMMENTS:**

____________________________________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________________________________

Note: If you’ve indicated that you are still searching for a job or graduate school, would you be willing to participate in a follow up survey? If so, could you please provide an email address we may use to contact you with the survey? Thanks!

*e-mail: ________________________________*