

ASSESSMENT REPORT 2015-2016

Computer Science

(Instructional Degree Program)

B.S.

(Degree Level)

Program Mission:

The mission of the Computer Science B.S. Program is to provide students with a challenging, market relevant and high-quality education in computer science.

Student Learning Outcome 1:

Understand basic computer science terminology, technology and programming methods.

NMHU Traits Specifically Linked to Student Learning Outcome 1

- Mastery of Content Knowledge and Skills

First Means of Assessment for Outcome 1:

Final grade from CS 144: Introduction to Computer Science; introduction to relevant terminology, technology and programming methods in computer science. Students mastery will be measured with a C or better in the course.

Summary of Data:

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	4
Total Number of Students Assessed:	7	Percent of Students Meeting Criterion:	40%

Second Means of Assessment for Outcome 1:

Final grade from CS 145: Introduction to Object Oriented Programming; introduction to relevant object oriented terminology, technology and programming methods in computer science. Students mastery will be measured with a C or better in the course.

Summary of Data:

Number of Students Meeting Criterion:	19	Number of Students Not Meeting Criterion:	7
Total Number of Students Assessed:	26	Percent of Students Meeting Criterion:	73%

Interpretation of Results for Outcome 1:

The dramatic discrepancy in CS 144 (fall 2015) was due to a number of factors: a) 5 of the 7 enrolled students were not CS majors or have since changed majors. b) 3 of the 4 students who did not meet criterion had minimal and infrequent attendance in class and did not participate in the final exam. c) 3 of the 7 enrolled students were motivated to take the class only to satisfy an elective. Interest in the subject area for these students was low as demonstrated by their poor attendance and decision not to take the final exam.

The introductory programming course (CS 145) is also impacted by similar factors. This course is typically challenging for entering freshmen as they are introduced to complex problem solving and implementation as well as learning a programming language of which they do not have prior exposure. Unfortunately, these challenges are met in some cases with lower motivation to complete the necessary assignments and lab work. In our CS145 course, for example, five of the seven students who did not meet criterion, early in the semester, ceased coming to class entirely. In a few of those cases, they attended all but a few of the first lectures, but never officially withdrawing from the course.

Student Learning Outcome 2:

Successfully apply knowledge of advanced programming methodology to complex problems in computer science.

NMHU Traits Specifically Linked to Student Learning Outcome 2

- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 2:

Programming Labs and Exams from CS 245: Advanced Computer Programming evaluating current knowledge of software engineering, debugging/testing, simple data structures and object oriented programming principles. Students' ability to successfully accomplish the above topics in programming methods will be measured by an achievement of a C or above in their final grade.

Summary of Data

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	11	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2:

Programming Labs and Exams from CS 350: Programming Seminar I evaluating current knowledge of advanced programming techniques and technologies involving complex

data structures and algorithms, graphical user interfaces and object-based programming utilizing sophisticated software development and debugging tools. Students' ability to successfully accomplish the above programming tasks will be measured by an achievement of a C or above in their final grade.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	9	Percent of Students Meeting Criterion:	100%

Third Means of Assessment for Outcome 2:

Programming Labs and Exams from CS 451: Software Engineering evaluating current knowledge of concepts and techniques of software engineering as related to object oriented design principles, integration of systems analysis into all aspects of the software life cycle, correctness and functionality of large scale software projects as formally specified in the design process. Students' ability to successfully accomplish the above programming tasks will be measured by an achievement of a C or above in their final grade.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	11	Percent of Students Meeting Criterion:	82%

Interpretation of Results for Outcome 2:

Computer Science majors do well with programming design and implementation on advanced topics in computer science. Note, this comes with faculty putting additional time and preparation into hands-on sessions with students to make sure all material is well understood from theory to practical implementation. Also, students are more motivated at this stage of the program. This is factored by their increased confidence and skill level to handle more complex problems but also their previous success in the program.

Student Learning Outcome 3:

Effectively design/implement a relevant computer science project and communicate ideas, information and results, both verbally and in writing that (1) demonstrate consistent logic/critical thinking; (2) are well organized; (3) state and defend a thesis; and (4) demonstrate competent use of language in oral and written reports. (5) Project works as designed with a complete demonstration to students and faculty.

NMHU Traits Specifically Linked to Student Learning Outcome 3

- Effective Communication Skills
- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 3:

Final grade (Oral presentation/Technical report) from CS 481: Senior Design term project in which students submit project proposal to computer science faculty for approval/modification Once approved student will successfully integrate previous course work into project and submit technical report to faculty as well as do an oral presentation for all computer science students and faculty at the end of the term. Students' ability to effectively communicate scientific ideas, information, and results will be measured by achievement of a score of a C or better on final grade in the course.

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	4	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 3:

Final grade (Oral presentation/Technical report) from CS 482: Senior Implementation term project in which students implement project proposal. A technical report to faculty as well as do an oral presentation for all computer science students and faculty at the end of the term will be required. Additionally, students will upload all source code and documentation to an open-source entity such as Github to build their professional portfolio as well as create a tracking/critique mechanism for faculty and external advisory board members to provide critical feedback to the students and program. Students' ability to effectively communicate computer science ideas, information, and results will be measured by achievement of a score of a C or better on their final grade in the course.

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	4	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 3:

Computer Science majors do well with communicating scientific ideas, information, and results. This is directly related to the amount of faculty-student engagement, requiring

dialogue in the classroom and requiring computer-assisted class presentations throughout the curriculum.

Assessment of Center Students:

(If your program is offered at one of the Centers please contact OIER to have an analysis conducted for those students. If this does not apply to your program you can delete this section.)

N/A

Assessment of Online Students:

(If your program is offered online please contact OIER to have an analysis conducted for those students. If this does not apply to your program you can delete this section.)

N/A

Utilization of Results:

The results of our assessments will be made available to our external advisory board and faculty. The feedback we receive regarding the results of our assessment will close the loop on our assessment system. This will allow us to apply both our internal faculty critique (internal feedback) and external advisory board critique (external feedback) to provide the proper amount and direction for growth and change in the program.