

CNM ANNUAL STUDENT LEARNING ASSESSMENT REPORT

Due to the Student Academic Assessment Committee by October 15



PART 1: REPORT INFORMATION

| Report Year and Contact Information | | | |
|-------------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|
| <u>2018-2019</u> Academic Year | <u>Chu Jong</u> Contact Person | <u>cjong@cnm.edu</u> CNM Email | <u>52704</u> CNM Office Extension |

| Subject of this Report |
|---------------------------------------|
| BIT--CSCI_AS--Computer Science Degree |

PART 2: CONTEXT IN WHICH THE ASSESSMENT TOOK PLACE

| Program/Area Highlights and Successes |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(Wherever applicable, include course completion rates, job placement outcomes, and licensing examination pass rates. See the program information dashboard at https://livecnm.sharepoint.com/sites/Dashboards/SitePages/Program%20Information%20Dashboard.aspx (access restricted to CNM employees) and other reports at https://www.cnm.edu/depts/opie.)</p> <p>The Computer Science (CSCI) program at CNM was initiated by the School of Mathematics, Sciences, and Engineering (MSE), although it may be dated 2015 (or even earlier) but the actual starting date recorded by the School of Business and Information Technology (BIT) is the spring semester 2016, the CSCI program officially transferred to BIT. The CSCI program curriculum has revised significantly based on the curriculum guidelines for undergraduate degree programs in Computer Science, the “Computer Science Curricular 2013” by the ACM/IEEE joint task force. Two major goals are: to ensure that our program acquires the national wide recognition and to provide our graduates the opportunity of pursuing advanced degrees at colleges/universities under their choice.</p> <p>We have minimum assessment results for the Computer Science program in this period because: First, this program started fall 2015 and only taught two non-major computer science courses (CSCI 1151 and CSCI 1153) with low enrollment. Second, the program objectives were revised (as described above) after it was transferred. Currently we are moving toward the direction to ensure our SLO and Assessment in compliant with the ABET (Accreditation Board for Engineering and Technology) accreditation process to accredit our Computer Science AS degree in the future. A meeting has conducted with ABET committee in November 2018 and the meeting result concluded that there is no CS AS accreditation, but the CE AS accreditation is available. Currently, we are seeking resources and alternatives to complete the accreditation process.</p> <p>The six regular courses of the CSCI program are:</p> <p>CSCI 1108 – CS For All: Introduction to Computer Modeling</p> <p>CSCI 1153 – Programming in Matlab</p> |

CSCI 1151 -- Introduction to Computer Programming for Non-Majors Computer Science

CSCI 1152 -- Introduction to Programming and Problem Solving, the CS1 in the Computer Science Curriculum Guideline by ACM/IEEE

CSCI 2251 -- Intermediate Computer Programming, the CS2 in the Computer Science Curriculum Guideline by ACM/IEEE

CSCI 2201 -- Mathematical Fundamentals of Computer Science

The CSCI 1152 (possibly CSCI 1151) also named as the CS1 in general by many institutions, it normally indicates the actual student enrollment of the computer science program by all higher education institutions. Starting from spring 2016, only one session of CSCI 1152 per semester for the first three semesters, two sessions of CSCI 1152 thereafter. The actual number of computer science students slowly but steadily increasing.

In addition to the regular courses, we had a few topic courses. Two for the robotic and one for the programming contest. We participated two different competitions, one was the ACM ICPC (International Collegiate Programming Contest) and the other was the NASA Swarmathon Physical Competitions. The CNM team acquired the second place at the 2016 Swarmathon Competition and the second-best technical report at the 2017 Swarmathon Competition. CNM also participated the 2018 Swarmathon Physical Competition and 2019 Swarmathon non-Physical Competition (because the funding ended).

Following are the number of the students acquired the CS AS and the CS classes in the past three academic years:

2016 to 2017 – 2 graduates Average Class Size: 20 Success Rate: 66.3%

2017 to 2018 – 3 graduates Average Class Size: 18 Success Rate: 56.2%

2018 to 2019 – 10 graduates Average Class Size: 21 Success Rate: 60.6%

Although the number of CS AS graduates is still low (almost all CS students want to acquire a BS degree, thus they may not consider an AS degree is their goal), the increasing CS AS degree indicates that students recognize that reaching a milestone is significant. We are expecting more than 20 students will acquire the CS AS degree in the year of 2019-2020. With the growth of student enrollment we continue encouraging our students to complete the requirements for their AS degree and move forward to acquire advanced degrees for building their career pathway.

Also the resource improvement of our CS teaching staff, we are expecting that the overall success rate of 65% in the year 2019-2020.

Changes Implemented During the Past Year in Support of Student Learning

A new course CSCI 1108, CS For All: Introduction to Computer Modeling was added to the CSCI curriculum in fall 2018. Computer Science for All is the formal President Obama's bold new initiative to empower all American students from kindergarten through high school to learn computer science and be equipped with the computational thinking skills they need to be creators in the digital economy, not just consumers, and to be active citizens in our technology-driven world. We worked with the UNM CS department and proposed a new course, CSCI 1108, in spring 2018, this course is intend to all majors which also include high school students who are interested in building their computational skills. We start deliver this course in fall semester 2018.

To enhance CSCI program education and improve student learning, we add a new full time faculty in fall 2018 and a couple of part time faculties (one in spring 2018 and one in fall 2018). Bi-weekly CSCI faculty meetings mainly focus on how to build better mechanisms for the computer science education at CNM.

PART 3: REPORT ON ASSESSMENT OF STUDENT LEARNING

| Assessment Method | Type of Assessment Tool | Population or Course(s) Assessed | Graduate Learning Outcome(s) Assessed | Mastery Level (E.g., "Minimum score of 3 on a rubric scaled 0-4" or "Minimum score of 75%") | Targeted % Achieving Mastery | Outcome |
|----------------------------------|-------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------|---------|
| Click or tap here to enter text. | Direct & Internal | CSCI 1108 – CS For All | Develop the knowledge of computational thinking skills and build the fundamental structures for agent-based computer modeling. | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 1152/1151, the CS1 | Develop moderate complex computer programs using programming languages | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 1152/1151, the CS1 | Apply appropriate data structure, access of data, operate data stored in the both internal and external computation devices | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 1152/1151, the CS1 | Demonstrate an understanding of algorithm, problem solving by creating algorithmic solutions, and provide practical implementations. | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 2251, the CS2 | Demonstrate knowledge of class and object, and apply to the Software Development Life Cycle (SDLC) | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 2251, the CS2 | Able to solve problem cross network and platform via both lower and higher level API | Click or tap here to enter text. | Choose an item. | N/A |

| | | | | | | |
|----------------------------------|-------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------|-----|
| Click or tap here to enter text. | Direct & Internal | CSCI 2201 | Apply the principles of a variety computation theories and techniques to solve problems. | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 2201 | Apply algorithms to problems involving complex computation, compare and analyze different approaches of computation problems | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 1153 | Apply software package (such as MATLAB) to solve computation problems. | Click or tap here to enter text. | Choose an item. | N/A |
| Click or tap here to enter text. | Direct & Internal | CSCI 1153 | Write programs using predefined functions and procedures, conditional statements, control structures, matrix computations, and graphing and plotting (using MATLAB). | Click or tap here to enter text. | Choose an item. | N/A |

| |
|---------------------------------------|
| Summary of Assessment Findings |
| N/A |

| |
|----------------------------------------------|
| Interpretation of Assessment Findings |
| N/A |

| |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Action Plan in Support of Student Learning (Describe changes to be made that are based at least in part on the assessment interpretation. If the assessment did not yield useful information, describe changes to be made in the assessment methodology and/or criteria.) |
| Continue improving/developing the students learning mechanisms based on the curriculum guidelines for undergraduate degree programs in Computer Science, the "Computer Science Curricular 2013". |

Please select all of the following that characterize the types of changes described in the above action plan:

- Assessment criteria revision
- Budgetary reallocation
- Curricular Revision
- Assessment methodology revision
- Change in teaching approach
- Faculty training/development
- Assignment revision
- Course content revision
- Process revision

| Recommendations, Proposals, and/or Funding Requests | Budget Needed |
|-----------------------------------------------------|---------------|
| Not yet – under development | TBD |

PART 4: REMAINING YEARS IN CURRENT ASSESSMENT CYCLE PLAN (including any revisions) – **OR -- UPCOMING ASSESSMENT CYCLE PLAN** (if this was the final year)

| Years of Full Cycle | Next Year's Assessment Focus (Describe how the next planned assessment is expected to provide information that can be used toward improving student learning.) |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Year 3 | SLO and Assessment in compliant with the ABET accreditation process |

| Graduate Learning Outcomes to Be Assessed | Years in which Assessment Is Planned | Population/Courses to Be Assessed | Planned Assessment Approach |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Develop the knowledge of computational thinking skills and build the fundamental structures for agent-based computer modeling. | After completion of the CS For All class (no year restriction) | CSCI 1108 – CS For All: Introduction to Computer Modeling | Programming assignments, exams, and project |
| Develop moderate complex computer programs using programming languages | After completion of the CS1 class (first year) | CSCI 1152/1151 | Programming assignments, homework, and project |
| Apply appropriate data structure, access of data, operate data stored in the both internal and external computation devices | After completion of the CS1 class (first year) | CSCI 1152/1151 | Programming assignments, homework, and project |
| Demonstrate an understanding of algorithm, problem solving by creating algorithmic solutions, and provide practical implementations. | After completion of the CS1 class (first year) | CSCI 1152/1151 | Programming assignments, homework, and exams |
| Demonstrate an understanding of algorithm, problem solving by creating algorithmic solutions, and provide practical implementations. | After completion of the CS2 class (second year) | CSCI 2251 | programming assignments, exams, and team project (software evaluation) |
| Able to solve problem cross network and platform via both lower and higher level API | After completion of the CS2 class (second year) | CSCI 2251 | Programming assignments, exams, and team project (reports, team work, and software package evaluation) |
| Apply the principles of a variety computation theories and techniques to solve problems. | After completion of the Discrete Math class (second year) | CSCI 2201 | homework assignments (include programming logic), class discussion, short exercises, and exams. |
| Apply algorithms to problems involving complex computation, compare and analyze different approaches of computation problems | After completion of the Discrete Math class (second year) | CSCI 2201 | homework assignments (include programming logic), class discussion, short exercises, and exams. |
| Apply software package (such as MATLAB) to solve computation problems. | After completion of the Programming in MATLAB class (first or second year) | CSCI 1153 | Lab assignments, homework, and exams |

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------|---------------------------|
| Write programs using predefined functions and procedures, conditional statements, control structures, matrix computations, and graphing and plotting (using MATLAB). | After completion of the Programming in MATLAB class (first or second year) | CSCI 1153 | Lab assignments and exams |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------|---------------------------|

| | | | |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |