# MS Computer Science

## Annual Summary Cycle – Year 3 (2013-2014)

### Program: MS Computer Science

<table>
<thead>
<tr>
<th>Program Learning Outcomes</th>
<th>Outcome Measures</th>
<th>Number of Students Assessed</th>
<th>% Did Not Meet</th>
<th>% Met</th>
<th>% Exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Demonstrate an ability to communicate advanced computer science topics effectively.</td>
<td>Portfolio of student projects and programs</td>
<td>97</td>
<td>7.70 %</td>
<td>48.13 %</td>
<td>44.27 %</td>
</tr>
<tr>
<td><strong>Comment:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Be prepared for advanced employment or doctoral program.</td>
<td>Portfolio of student projects and programs</td>
<td>116</td>
<td>9.00 %</td>
<td>51.00%</td>
<td>40.00 %</td>
</tr>
<tr>
<td><strong>Comment:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comments:
During the academic year 2013-2014 two program learning outcomes were assessed as per the proposed three-year cycle. Courses taught in Fall 2013 and Spring 2014 were sampled and for each sampled class one or both PLOs were assessed. Assignments, projects, quizzes and tests from these classes were used to determine percentage of student who did not perform well, who did well, and who excelled the expectations with respect to assessing these PLOs.

97 students contributed in assessing PLO 5 of which 48.13 % of the students exhibited the ability to effectively communicate orally and in writing from one or more classes, in the areas of data processing, distributed computing, software design, computer networks, and information security. 44.27 % of the students demonstrated excellence, while 7.70 % did not show convincing evidence. The examination of this data indicates that overall 92.40 % (48.13 + 44.27) of the students demonstrated that they can communicate effectively in technical areas, while 7.70% need improvement in communication skills.

118 students contributed in assessing PLO 6 of which 51.00 % of the students exhibited the skill that they are ready for advanced level employment or continue a study in the doctoral program. 40.00 % of the students demonstrated excellence while 9.00 % did not show convincing evidence. The examination of this data indicates that overall 91.00 % (51.00 + 40.00) of the students demonstrated that they are ready for advanced level employment or to pursue further study leading to a doctoral degree. Only while 9.00 % of the students need improvement in the above areas.

This is the first cycle of the program learning outcomes assessment and hence cannot be compared to show improvement over previous years. It will be done during the second cycle of assessment.
**Program:** MS Computer Science  
**Contact:** Arvind Shah, Boris Peltsverger

**Learning Outcome:** 2. Demonstrate the ability to identify, formulate and solve problems.

**Proposed Action:** To evaluate students' ability to analyze given problems, and implement solutions in the decision support system class.

**Rationale for Proposed Action:** Decision Support Systems require students to formulate a problem and develop a model to solve it.

<table>
<thead>
<tr>
<th>Target Timeline</th>
<th>Expected Results</th>
<th>Individual Responsible</th>
<th>Resources Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer 2015</td>
<td>Analysis of students' survey outcomes (D2L)</td>
<td>Alexander Yemelyanov, Arvind Shah</td>
<td>none</td>
</tr>
</tbody>
</table>

**Additional Comments:** CIS 5310 Decision Support Systems – Summer 2015
Program: MS Computer Science

Program Learning Outcome (PLO): 5. Demonstrate an ability to communicate advanced computer science topics effectively.

Proposed Action: Indicate classes, which would develop and assess an ability to communicate advanced computer science topics effectively. Create rubrics for assessment of students’ communications and conduct assessments.

Rationale for Proposed Action: The proposed actions will help to evaluate skills declared in PLO 5.

<table>
<thead>
<tr>
<th>Target Timeline</th>
<th>Expected Results</th>
<th>Individual Responsible</th>
<th>Resources Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2014</td>
<td>Outcomes from the proposed action will allow to identify problems and propose improvement</td>
<td>Arvind Shah, Boris Peltsverger</td>
<td>None</td>
</tr>
</tbody>
</table>

Additional Comments

In a response to the proposed action, graduate students were surveyed on the development of communication skills. The instructors also provided information on how their courses contributed to the proposed action.

Courses which contributed to the proposed action

The following courses contributed to the development of communication skills in advanced computer science topics: (1) CIS 6900 – Database Programming in PL/SQL (Fall 2013), (2) CSCI 6410 – Advanced Database Systems (Spring 2014), (3) CSCI 6230 - Internetworking Architectures & Protocols (Fall 2013), and (4) CIS 6800– Human Computer Interaction and Interface Design (Fall, 2013).

Summary of the students’ responses

Responses received from graduate students clearly states that in several courses they were required to write technical documents explaining the completion of tasks for projects as well as the instructions to execute applications created during the projects. In some courses, they were required to work on projects in teams which required both oral (class presentation, telephone conversation, and teleconferencing using WebEx conferencing software) and written communication (technical documentation, user’s guide, and email).

Summary of the instructors’ responses

Outcomes from the courses, which contributed to the proposed action, demonstrate that the students have an ability to effectively communicate with varied levels of user groups, to translate the users’ requirements into application functionality, to write documentation and user’s guide, and to make a class presentation. Group discussions were the important components of all contributed courses; they required intensive communication among their peers. It helped students learn from each other and develop communication skills and ability to join and participate in a professional discussion. Moreover, one of the course components required students to conduct research and present results their research in the online presentation events via Google Hangout.
Program: MS Computer Science

Contact: Arvind Shah

Program Learning Outcome (PLO): 6. Be prepared for advanced employment or doctoral program.

Proposed Action: Implement industrial-strength software in the appropriate graduate classes. Offer CS/CIS 6900 Special Topics classes, which reflect the current trends in the computing industry. Develop a students' survey, which provides questions for self-evaluation skills, which are required for advanced employment or enrollment in a doctoral program.

Rationale for Proposed Action: The proposed actions will help to improve and evaluate skills, required for advanced employment or enrollment in a doctoral program.

<table>
<thead>
<tr>
<th>Target Timeline</th>
<th>Expected Results</th>
<th>Individual Responsible</th>
<th>Resources Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2014</td>
<td>Students will be better prepared for advanced employment or doctoral program</td>
<td>Arvind Shah Boris Peltsverger</td>
<td>none</td>
</tr>
</tbody>
</table>

Additional Comments

Students were surveyed on their readiness for advanced employment or for a doctoral program. Instructors also provided information on how their courses contributed to the proposed action.

Courses which contributed to the proposed action

The following courses contributed to the proposed action (1) CIS 6900 – Database Programming in PL/SQL (Fall 2013), (2) CSCI 6410 – Advanced Database Systems (Spring 2014), (3) CIS 6720 – Distributed Web Applications (Spring 2014), (4) CSCI 5120 Topics in Information Security (Fall 2013), (5) CSCI 6220 Distributed Operating Systems (Spring 2014), (6) CSCI 6900 Special Problems in CS – Multi-criteria Decision Making (Spring 2014), (7) CIS 6800– Human Computer Interaction and Interface Design (Fall, 2013).

Summary of the students’ responses

Students clearly stated that all listed above courses offered hands-on assignments and projects. These projects were challenging and informative, and can serve a base for advanced employment. The courses also required to submit research papers related to the latest computer technologies.

Summary of the instructors’ responses

Courses, that contributed to the proposed action prepared students with employment targeted skills such as business intelligence, multi-criteria decision making, a challenging process of software development, which helps them to learn them the best practices in planning the work, communicating with other developers, testing and debugging of the software, and writing software documentation. The students were given an opportunity to learn 1) how professional developers use the database environment to meet the competitive world requirements, 2) cloud computing - a new trend in the computing field, and 3) research articles. The students learnt the theory and also used industrial strength software, such as, Microsoft Visual Studio 2010 and Microsoft Cloud Computing Environment, SQL Server 2012, Oracle 11g, ColdFusion 10, CogTool, and data mining software, Weka. For the last seven years four former graduate students defended Ph.D. dissertations and several students were employed by Amazon.com, Microsoft, and EMC,
**Program:** MS Computer Science  
**Contact:** Arvind Shah, Boris Peltsverger

**Learning Outcome:** 1. Demonstrate depth of knowledge in areas of computer science, including data processing, distributed computing, software design, computer networks, and information security.

**Proposed Action:** To evaluate depth of knowledge in the area of information security.

**Rationale for Proposed Action:** Knowledge in information security is one of the vital skills for computer science graduates.

<table>
<thead>
<tr>
<th>Target Timeline</th>
<th>Expected Results</th>
<th>Individual Responsible</th>
<th>Resources Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2014</td>
<td>Analysis of students’ survey outcomes (D2L)</td>
<td>Simon Baev, Arvind Shah</td>
<td>none</td>
</tr>
</tbody>
</table>

**Additional Comments:** CSCI 5120 Topics in Information Security – Fall 2014