

STUDENT LEARNING ASSESSMENT REPORT

PROGRAM: MS Information Technology (IT)

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EXECUTIVE SUMMARY

Marymount's Information technology (IT) program offers advanced study to prepare individuals for leadership roles in the IT industry, whether managing enterprise infrastructure, designing computer systems with current systems life cycle methodologies, creating and maintaining high-quality computer software, engaging in cybersecurity management or technical operations, or managing complex IT projects. A dual degree in information technology and cybersecurity, a variety of electives, a research or project option, and specialized tracks enable individuals to tailor their graduate studies to their career needs in government or industry. Students have the option of choosing a specialized track to complete their program including:

- Cybersecurity
- Health Care Informatics
- Project Management and Technology Leadership
- Software Engineering

The program is designed to provide the academic foundation for those seeking to become a chief information officer (CIO) or attain a similar senior IT position.

The full-time faculty for this program conduct research in information cybersecurity, data management, open source software, technology for health care, and other areas. Adjunct faculty work in the field in areas such as requirements analysis, cybercrime detection, hardware design, software development, database management, cybersecurity, and operations management.

Learning Outcome	Year of Last Assessment	Assessed This Year	Year of Next Planned Assessment
Identify and solve complex problems in business and society using information technology, including the application and management of complex systems of hardware, software, networks, databases, and computer security.	2008-2009 2011-2012 2014-2015		2017-18
Exercise leadership in analyzing, designing, developing, and integrating IT solutions that meet industry-wide standards using system engineering principles.	2007-2008 2010-2011 2013-2014	XX	2018-19
Manage enterprise-wide information systems to ensure that an organization is competitive in today's global and high performance environment following strong ethical principles.	2007-2008 2010-2011 2013-2014		2016-17
Use specialized knowledge and skills to obtain skills and, if applicable, certifications in areas such as software development, database and storage technology, computer security, IT governance, and project management.	2008-2009 2011-2012 2014-2015		2017-18
Optimize the effectiveness of IT in an organization by effective IT governance, development of IT strategic plans, implementation of IT policies, and assurance of ethical awareness of the enterprise use of information	2009-2010	XX	2018-19
Communicate effectively with others, including technologists and managers in the IT field and users and managers in the business context.	2008-2009 2009-2010 2011-2012	XX	2017-18
Work effectively as a member or as a leader of a cross-disciplinary team in the IT field where teamwork is essential to the success of a time-critical project.	2007-2008 2009-2010 2014-2015		2016-17
Develop the knowledge and skills required to pursue life-long learning in areas relating to information technology and to adapt to an ever-changing, global technology and business environment through information literacy activities relevant to a fast-changing discipline.	2010-2011 2013-2014		2016-17

The Marymount IT graduate program (including the parallel program the MS in Cybersecurity) continues to grow and attract more students, particularly from individuals who want to change careers. Some have a good background in information technology, others do not. A few students make use of the 5-year program and have attended Marymount as an undergraduate. In 2015-16, the MS IT was in the top five



graduate program at the university with some 63 students in fall 2015, as well as about 12 additional students in dual degree programs with the MS in information technology as one component.

The first learning outcome assessed was the ability to exercise leadership in analyzing, designing, developing, and integrating IT solutions that meet industry-wide standards using system engineering principles. This is the basics of one of the major job outcomes for the program, the role of the business analyst. Two of the three measures were met showing the necessary skills are acquired at the end of the program. On graduation, only 66.7% of the graduating students felt that they could “solve the problems in the field”. However, 83.3% of the students felt that they “can apply knowledge and skills to new situations”. The standard for the outcome was partially met. This may be a reflection of the changing nature of the IT fields as many problems to be solved will require new knowledge to be obtained.

The second learning outcome assessed was the ability to optimize the effectiveness of IT in an organization by effective IT governance, development of IT strategic plans, implementation of IT policies, and assurance of ethical awareness of the enterprise use of information. All outcomes were met. Ethics is a strong point throughout our curriculum and is covered in each course. IT550, Ethics, Law, and Policy in the Information Age, is a required course taken by all students in the program.

The third learning outcome assessed was based on one of the most requested soft-skills in the information technology field: written and oral communication. Two of the three outcomes were fully met but the third was only partially met with students not confident in their ability to write a coherent argument after graduation. We continue to reinforce writing through the curriculum and are planning to add some of the concepts behind the undergraduate writing intensive courses to two of the early courses in the program.

Describe how the program’s outcomes support Marymount’s mission, strategic plan, and relevant school plan:

The MS in Information Technology program is fully compliant with the graduate education mission of Marymount University and the outcomes include both the opportunity to acquire a high level of competency in the IT field (identify and solve complex problems in business and society) and to gain experience in the application of advanced knowledge and skills (including leadership, strategy, management, and technical competence). It also includes skills that are commonly requested by today’s employers (understanding the business value of IT, ethical data-driven decision-making, quantitative skills, problem solving, communication skills and the ability to work in teams). Finally, it recognizes the changing nature of the IT field and hence the need for life-long learning based on skills in information literacy and the ability to keep current with changes in the field.

In the 2011-12 school year the President articulated a new "vision" for the university. The items in the vision statement that apply specifically to the graduate IT program include:

- Emphasize inquiry learning at all levels and provide students and faculty with opportunities for research collaboration.
- Offer programs that enable graduate students to develop the knowledge, skills, and values needed for professional success.
- Ensure a personalized education through small classes and faculty/student collaboration.
- Integrate an emphasis on ethics throughout the curriculum.
- Encourage cross-disciplinary collaboration.

Inquiry learning is a key in the program and all professors (full-time and part-time) are encouraged to use activities, in-classroom or as homework assignments, to reinforce the subject matter presented in the classroom. These activities may occur through individual and group assignments and may be research-based or more practically oriented. We constantly evaluate the subject matter covered in the program to ensure we match the knowledge and skills required in the current work place, as identified by our own knowledge of the field and from recommendations from close attention to the various certification requirements in the many IT disciplines. Graduate classes average around 16 students, large enough to have a variety of opinions and experiences but small enough to allow for individual attention and extensive faculty/student collaboration. We offer some courses in an on-line format and offer a variety of courses in the summer semester. Our program facilitates students to customize their program of studies to their individual pace and needs, reflecting the variety of skills needed in the IT work place. Ethics are an integral part of each course but particularly emphasized in the required course IT550, Ethics, Law, and Policy in the Information Age. Cross-disciplinary collaboration has been enhanced by the dual degree programs and the addition of students with a business or health care management into our classes has increased the interdisciplinary discussions in class and the number of interdisciplinary efforts in the capstone project.

Community Engagement

- Use DC-area resources and new technologies to enhance the global perspective of the Marymount community.

The IT program has a very international focus with students from Nepal, Ethiopia, India, and Saudi Arabia being the largest subgroups. In addition, our teaching pool is similarly international with representatives from Great Britain, China, Turkey, Thailand, Lebanon, Jamaica and Germany. Others have travelled extensively and use their experiences to enhance their classroom teaching. We make also use of the DC area for frequent guest speakers. For Example, Dr. Schaeffer takes the IT550 students to one of the monthly meetings of the World Affairs Council where global issues are discussed.

- Pursue opportunities for growth in key graduate programs.

The program has continued to thrive and in the 2015-16 school year there were 63 students in the Fall 2015 semester, 67 in Spring 2016, and 40 in Summer 2016, as well as about 12 students in dual degree programs (MBA/IT or HCM/IT). The numbers are a little higher than five years ago. The introduction of the MS in Cybersecurity program in Fall 2013, allowing students to specialize in depth in this growing field, did reduce enrollment in the IT program, but the two programs together show significant growth (a total of 99 students in spring 2016).

The School of Business Administration (SBA) vision includes three pillars: business, health care management, and information technology. An important consideration is the relationship between business and IT. As government organizations move towards "open government" and many businesses strive towards "transparency", so technology plays an increasingly important role in the success of these organizations and communication between business professionals, customers, and IT personnel becomes paramount. New techniques for collaboration and communication, including mobile technology, cloud computing, and social media, are included in the curriculum to meet increased industry's reliance on IT. The focus today is not merely on software development, but also on the effective management of IT services through governance and strategic planning which combine business needs with technological developments. In addition, the role of IT in health care is rapidly gaining significance as providers move to electronic medical records and the increased focus on the analysis of the vast amount of data that result from this.

Provide a brief description of the assessment process used including strengths, challenges and planned improvements and provide evidence of the existence of a culture of continuous improvement based on assessment:

In the 2015-16 school year, the collection of data for the assessment process was effective with good participation from the departmental faculty (full-time and part-time). There was a delay in the final preparation of the report owing to the ill health of the program director.

Outcome assessment techniques were discussed early at a department meeting of Graduate faculty. The plans from the previous assessment were discussed, and plans put in place to focus on the three learning outcomes. Common rubrics from previous evaluations were discussed, including how they would be applied and in which designated courses. Data collection requirements and deadlines were identified.

A number of other initiatives were also identified as part of our continuous improvement process including revising scheduling to meet the additional number of working students, the development of a new course on drones in Spring 2016, and the widespread inclusion of cloud computing through the technical aspects of the curriculum.

A graduate assistant was appointed to be the coordinator for data collection and initial data analysis.

Describe how the program implemented its planned improvements from last year:

Outcome	Planned Improvement	Update <i>(Indicate when, where, and how planned improvement was completed. If planned improvement was not completed, please provide explanation.)</i>
Identify and solve complex problems in business and society using information technology, including the application and management of complex systems of hardware, software, networks, databases, and computer security.	To increase the amount of time devoted to the actual research in the IT680, IT Master’s Project, rather than in the proposal planning effort by minimizing the proposal preparation phase.	For Spring 2016 Dr. Liu revised the curriculum to reduce the proposal requirements and to ensure that the required information was available on day 1 to establish the proposal requirements. This has continued in Fall 2016.
Use specialized knowledge and skills to obtain skills and, if applicable, certifications in areas such as software development, database and storage technology, computer security, IT governance, and project management.	We planned to do this by making the certifications obtained by students more visible.	We have not made a website available but we do acknowledge certifications at our monthly student group meetings.
Work effectively as a member or as a leader of a cross-disciplinary team in the IT field where teamwork is essential to the success of a time-critical project.	The student’s performance in team work has improved over the last few years as many instructors have provided more instructions on the background to team work.	New faculty are given guidance on the need for some team work in each courses and given a list of resources to be provided to students on how to effectively work in teams.

Provide a response to last year’s University Assessment Committee review of the program’s learning assessment report:

The review of last year’s assessment report by the University Assessment Committee was particularly positive, with all criteria being exemplary.

Outcomes and Past Assessment

Learning Outcome 1:

Exercise leadership in analyzing, designing, developing, and integrating IT solutions that meet industry-wide standards using system engineering principles.

Is this outcome being reexamined? X Yes No

When assessed in 2013-14, all three outcomes were met. The coverage of the systems development lifecycle seems to satisfy both the technical students and the IT management students with a few of the IT management students being only partly satisfied. Assessment by a committee of professors of the deliverables in the capstone project provided valuable insights in how we can better prepare students for this final project and this work has continued.

Assessment Activity

<u>Outcome Measures</u>	<u>Performance Standard</u>	<u>Data Collection</u>	<u>Analysis.</u>
Direct: Evaluation of the final course project and presentation for each semester of IT510, Requirements Analysis	75% of students in IT510, Requirements Analysis, receive a value of 20 out of 25 for the report and presentation evaluated in accordance with rubric 1 (see attachment).	29 students were enrolled in Fall 2015 and 14 in Spring 2016, (a total 43). The final reports were retrieved from Blackboard by the department chair before they were graded by the professors. She also attended the presentations and participated in the student survey of each presentation. She read each report and analyzed them using a pre-defined rubric (see Rubric 1).	<p>The reviews were made on a semester basis.</p> <p>28 were evaluated in Fall 2015 and 14 in Spring 2016. Of the 42 students who completed the IT510 report and presentation, 36 students (85.7 %) received a score of 20 or more for their report and presentations.</p> <p>The standard for the outcome of a good rating was met.</p> <p>Of the 6 students who did not meet the standard 5 were in their first semester of the program.</p>

		The maximum score was 25 and 20 or more is considered a good rating.	
Indirect: From the Graduating Student Survey, confidence that the student can "solve problems in your field using your knowledge and skills" or "can apply knowledge and skills to new situations"	75% of students should feel good or adequate about their response to the question "solve problems in your field using your knowledge and skills" and "can apply knowledge and skills to new situations"	Data was collected from the 2015-16 Graduating Student Survey, conducted by the Office of Planning and Institutional Effectiveness	<p>Only 66.7% of the graduating students felt that they could "solve the problems in the field".</p> <p>However, 83.3% of the students felt that they "can apply knowledge and skills to new situations"</p> <p>The standard for the outcome was partially met.</p> <p>This may be a reflection of the changing nature of the IT fields as many problems to be solved will require new knowledge to be obtained.</p> <p>There were 12 responses.</p>
Direct: Review of the deliverables from the IT680, Master's Project, including the report, the presentation, and the retrospective.	80% of students scored 20 or better on the rubric given in the attachment as Rubric 2	<p>During the IT Master Project, students are asked to prepare a series of deliverables including the project report, presentation and a performance retrospective.</p> <p>The results were reviewed by a committee consisting of the department chair, two professors who taught in the program, and two other professors in the SBA.</p> <p>Each response was scored as fully, partly, or not at all and the committee grades were averaged</p>	<p>There were 17 students in fall 2015, 10 students in Spring 2016 and 13 students in Summer 2016 (total of 40 students). Of the 40 reports, 21 were able to fully demonstrate their abilities, 15 were considered adequate, and only 4 student were considered not competent. The average score of 20 was attained by 90%</p> <p>The standard for the outcome was met.</p>

Interpretation of Results

Extent this learning outcome has been achieved by students *(Use both direct and indirect measure results):*

Two of the three standards were met and the third was partially met. The one area of concern was the fact that some graduated students did not feel that they could solve problems in the IT field.

Program strengths and opportunities for improvement relative to assessment of outcome:

Faculty is constantly reviewing the content of each course to ensure that the materials that are covered are relevant to the IT field, in business and industry. However, new problems in IT are always arising, so some students may feel that they cannot answer all IT problems as this might need the acquisition of new knowledge first. However, other questions in the Graduating Students Survey point to their confidence in their ability to research a new problem (91.7% felt they could find appropriate sources of information and 83.3% felt that they could effectively evaluate the information they found).

Discuss planned curricular or program improvements for this year based on assessment of outcome:

We intend to hold one or more sessions as part of our monthly student meetings to highlight problem solving in IT using outside speakers to talk about how they solved some problems

Learning Outcome 2: Optimize the effectiveness of IT in an organization by effective IT governance, development of IT strategic plans, implementation of IT policies, and assurance of ethical awareness of the enterprise use of information.

Is this outcome being reexamined? X Yes No

In 2009-10, the three selected measures showed that that the outcomes were for the most part met (two out of three). Ethics seemed to be well covered although there appeared to be some difficulties with students explaining IT governance concepts outside of their field.

Assessment Activity

<p align="center"><u>Outcome Measures</u> <i>Explain how student learning will be measured and indicate whether it is direct or indirect.</i></p>	<p align="center"><u>Performance Standard</u> <i>Define and explain acceptable level of student performance.</i></p>	<p align="center"><u>Data Collection</u> <i>Discuss the data collected and student population</i></p>	<p align="center"><u>Analysis</u> <i>1) Describe the analysis process. 2) Present the findings of the analysis including the numbers participating and deemed acceptable.</i></p>
<p>Direct: Evaluation of a course project in IT610, IT Governance and Strategy</p>	<p>70% of students in IT670, IT Governance and Strategy, receive a value of 12 out of 15 for the report evaluated in accordance with rubric 3 (see attachment).</p>	<p>15 student reports from Fall 2015 and 11 from Spring 2016 (total 26), were submitted for evaluation by the department chair (see Rubric 3).</p> <p>The maximum score is 15 and 12 or more is considered effective.</p>	<p>Each semester, each project was reviewed by the department chair who read and rated according to the rubric in Rubric 3. 15 were evaluated in Fall 2015 and 11 in Spring 2016. Of the 26 students who completed the IT670 report, 19 students (73%) received a score of 12 or more for their projects.</p> <p>The standard for the outcome was met.</p>
<p>Indirect: From the Graduating Student Survey, confidence that the student can act ethically when faced with ethical situations</p>	<p>70% of students should feel good or adequate about their response to ethical dilemmas on graduation.</p>	<p>Data was collected from the 2015-16 Graduating Student Survey, conducted by the Office of Planning and Institutional Effectiveness</p>	<p>83.3 % of graduating students felt that they could determine the most ethically appropriate response to a situation. 75% of graduating student also felt that they understood ethical dilemmas in the field. These are scores of 4 or 5 on the assessment.</p> <p>The standard for the outcome was met. There were only 12 responses.</p>
<p>Direct: Assessment of the research paper in IT550, Ethics, Law and Policy in the Information Age in Fall 2015 and Spring 2016.</p>	<p>70% of students achieved greater than 10 out of 13 on the rubric developed to evaluate the research paper (Rubric 4).</p>	<p>In Fall 2015, Ethics, Law and Policy in the Information Age, each student researched an ethical issue in a specific business area. The courses were taught by Dr. Schaeffer and she used rubric 4 to evaluate the student's performance.</p>	<p>She taught 20 students in Fall 2015 and evaluated the major project from the course using a standard rubric (see Rubric 4). 18 of the 20 students received a score of 10 or more on the assignment (90%).</p> <p>The standard for the outcome was met.</p>

Interpretation of Results

Extent this learning outcome has been achieved by students *(Use both direct and indirect measure results):*

All outcomes were met to the standard required.

Program strengths and opportunities for improvement relative to assessment of outcome:

Ethics is a strong point throughout our curriculum and is covered in each course. IT550, Ethics, Law, and Policy in the Information Age, is a required course taken by all students in the program.

Discuss planned curricular or program improvements for this year based on assessment of outcome:

We continue to update the curriculum to include new ethical concerns (e.g., data breaches) and to highlight the security needs to protect personally identifiable information (PII) in a world of network connectivity where cyn

Learning Outcome 3: Communicate effectively with others, including technologists and managers in the IT field and users and managers in the business context.

Is this outcome being reexamined? X Yes No

If yes, give a brief summary of previous results (including trends) and any changes made to the program.

In the last assessment of this learning objective (2009-10), students met the performance standard in all three of the outcome measures, showing a 2% improvement in the one measure that was repeated from the previous year. We have continued to stress communication (oral and written) throughout the program and each course is required to include some element.

Assessment Activity

Outcome Measures Explain how student learning will be measured and indicate whether it is direct or indirect.	Performance Standard Define and explain acceptable level of student performance.	Data Collection Discuss the data collected and student population	Analysis 1) Describe the analysis process. 2) Present the findings of the analysis including the numbers participating and deemed acceptable.
Direct: Evaluation of communication activities in the requirements definition process of the project in IT510, Requirements Analysis, which is a group project	Students rate 70% of the team members as effective or very effective in the communication process on the project in IT510, Requirements Analysis. 8 out of 10 on the rubric (Rubric 5) is considered as effective	A questionnaire is given as a confidential evaluation by the student of the team as a whole and each member of the team to assess the communication skills of the team members. There were 29 students in Fall 2015 and 14 students in Spring 2016 (total 43 students).	13 rated their team or at least one of their team members as ineffective or only partially effective in their communications in team work leaving 30 with a positive feeling about their team and its members (71%). The most common complaint was collaborative writing efforts. The standard was met.
Indirect: From the Graduating Student Survey, confidence by the graduating students in their ability to give effective presentations and prepare effective written reports	80% of students should feel good or adequate about their written and oral skills	Data was collected from the 2015-16 Graduating Student Survey, conducted by the Office of Planning and Institutional Effectiveness	66.7% of graduating students felt that they could develop a coherent written argument and 75% felt that they can deliver a coherent oral presentation. This standard was NOT met.
Direct: Performance on a presentation in a high level course towards the end of the program	80% of students should get at least 21 out of 28 in the final presentation in the IT Governance (IT610) course using Rubric 6	The department chair and one other IT professor attended the class presentations and rated the students using the rubric 6	22 of the 26 students (84%) of student received 21 or more on the assigned rubric. The standard was met.

Interpretation of Results

Extent this learning outcome has been achieved by students *(Use both direct and indirect measure results):*

This outcome was met in two of the measures and partially met in the third. Writing a coherent argument remains an important issue as writing is a major requirement of our graduates

Program strengths and opportunities for improvement relative to assessment of outcome:

Writing continues to be a major focus in each course. We do have an increased percentage of foreign students and some additional effort needs to be given to their English writing skills.

Discuss planned curricular or program improvements for this year based on assessment of outcome:

Students need a more structured environment to improve their writing and in two early courses we will implement the draft and final process that has been successful in the writing intensive undergraduate courses.
