Annual Program Report

Program Name:	**Master in Cyber Security, MCS**
Qualification Level:	**Post graduate**
Department:	**Information technology**
College:	**Computation and Informatics**
Institution:	**Prince Musaid Bin Abdulrahman University**
Academic Year:	**2019-2020**
Main Location:	**Riyadh**
Branches offering the Program:	• Dammam • Jeddah

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A. Implementation of Previous Action Plan

Considering the recommendations of previous year annual report, list the planned actions and their status.

Planned Actions	Responsibility of Action	Planned Completion Date	Level of Completion		If Not Completed	
			Completed	Not Completed	Reasons	Proposed Actions
The start of the program under the new name with improvement to the curriculum.	IT department	June 2019	-			

B. Program Statistics

1. Students Statistics (in the year concerned)

No.	Item	Results
1	Number of students who started the program	**41**
2	Number of students who graduated	**31**
3	Number of students who completed major tracks within the program (if applicable)	
	a.	
	B	
	c.	
4	**a.** Number of students who completed the program in the minimal time	**NA**
5	**a.** Percentage of students who completed the program in the minimal time (Completion rate)	**NA**
6	Number of students who completed an intermediate award specified as an early exit point (if any)	**NA**
7	Percentage of students who completed an intermediate award specified as an early exit point (if any)	**NA**
Comment on any special or unusual factors that might have affected the completion rates: **N/A**		

Number of students who started the program based on Branch and Gender:

2019-2020		
Branch	Students	Gender
Riyadh-Females	11	F
Riyadh-Males	21	M
Jeddah-Females	0	F
Jeddah-Males	4	M
Dammam-Males	5	M
Total	**41**	

2. Analysis of Program Statistics

(including strengths, areas for improvement, and priorities for improvement)

Strengths :

Students can complete the program requirements in 4 semesters.

Areas for Improvement:

The rate of withdrawn male students should be considered. Increase the number of female students Open new branches
Priorities for Improvement:
Increase the number of female students.

C. Program Learning Outcomes Assessment

1. Program Learning Outcomes Assessment Results.

#	Program Learning Outcomes	Assessment Methods (Direct and Indirect)	Performance Target	Results
Knowledge				
K1	Describe the various IT security models, their structure, and the risks associated with transferring and storing information in global organizations.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	75.536667
K2	Define solutions to protect information assets from threats and intrusions, both internal and external, to organizations in a global environment.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	91.3775
K3	Recognize the various weaknesses of IT networks and their vulnerabilities to both internal and external threats and intrusions.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	92.71
K4	Describe the ethical issues surrounding information security in a global environment.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	74
Skills				
S1	Differentiate between various information security models; their strengths and weaknesses in protecting information assets in a global environment.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	84.298
S2	Interpret the impact of emerging information security technologies and processes on protecting an organization's information assets.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	89.065

S3	Summarize the legal issues surrounding information security including information privacy and legitimacy.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	97
S4	Develop comprehensive solutions to reduce the business impact of information security threats, attacks, and intrusions.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	74.206667
S5	Evaluate solutions for protecting the Internet and information networks from internal and external cyber-attacks.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	88.02
S6	Analyze IT security models and their capabilities to mitigate the risks associated with protecting information assets in a global environment.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	89.526
Values				
C1	Research innovations in best practices in information security.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	92.396
C2	Demonstrate the application of effective written communication and research skills.	**Direct Assessment Tool** Actual Grades Capstone project Course Practical Activities **Indirect Assessment Tool** NA	70%	81.845
Comments on the Program Learning Outcome Assessment results.				
All PLO achievement rates are satisfactory.				

* Include the results of measured learning outcomes during the year of the report according to the program plan for measuring learning outcomes

** Attach a separate report on the program learning outcomes assessment results for male and female sections and for each branch (if any)

2. Analysis of Program Learning Outcomes Assessment

(including strengths, Areas for Improvement:, and priorities for improvement)

Strengths :
Most of the program learning outcomes assessments are achieved.
Areas for Improvement:
NA

Priorities for Improvement:
NA

D. Summary of Course Reports

1. Teaching of Planned Courses / Units

List the courses / units that were planned and not taught during the academic year, indicating the reasons and compensating actions.

Course	Units/Topics	Reasons	Compensating Actions
NA	NA	NA	NA

2. Courses with Variations

List courses with marked variations in results that are stated in the course reports, including: (completion rate, grade distribution, student results, etc.), and giving reasons for these variations and actions taken for improvement.

Course Name &Code	variation	Reasons for variation	Actions taken
NA	NA	NA	NA

3. Result Analysis of Course Reports

(including strengths, Areas for Improvement:, and priorities for improvement)

Strengths :

- Reviewing the courses' contents is an ongoing process. All MCS instructors participate in reviewing their courses during the academic year.
- Moreover, the MCS program, in collaboration with the CSUG University, periodically reviews study plans and develops the courses contents. In a collaborative process between the MCS and CSUG faculty members, an annual review is conducted for each course and a Course Design Document (CDD) is prepared and, once approved, it is reflected on the course syllabus and Blackboard. A sample of approved CDD can be accessed from Ref.2.38.
- The course contents were covered as scheduled across all three branches.

Areas for Improvement:

Based on students' feedback from various courses, there are several areas for improvement that can enhance the overall learning experience. Students highlighted the need for clearer instructions about coursework at the beginning of the course, which can prevent confusion and provide a solid foundation for learning. Additionally, there is a demand for more practice in report writing and in general, as it helps reinforce learning and develop practical skills.

To optimize project-based courses, it is crucial to establish clear project requirements from the start of the semester. Dividing the project into phases and regularly applying and evaluating these phases throughout the semester can ensure a structured and well-paced learning experience. Furthermore, addressing clear requirements in critical thinking and discussions is essential to promote a deeper understanding of the subject matter.

Streamlining the content of each chapter is another important improvement area. By reducing duplication and unnecessary information, students can focus on the key concepts and engage more effectively with the material. Moreover, considering the lengthy content, integrating virtual classes alongside face-to-face sessions can provide additional learning opportunities and facilitate better understanding.

To enhance the learning experience, it is recommended to decrease the emphasis on class discussions and critical thinking activities. Instead, introducing a laboratory component can offer practical, hands-on experience, fostering a deeper understanding of the subject matter. Furthermore, adopting a more accessible and reader-friendly textbook can facilitate comprehension and engagement among students.

Priorities for Improvement:

- Incorporate additional practice opportunities, specifically focusing on report writing and general skills.
- Establish clear project requirements from the start, dividing them into manageable phases for evaluation.
- Review and clarify requirements for critical thinking and discussions.
- Streamline content by removing duplication and unnecessary information in each chapter.
- Introduce a laboratory component to offer practical hands-on experience.
- Evaluate and consider adopting a more accessible and reader-friendly textbook.
- Regularly review and update course materials to reflect the latest developments in the field.
- Conduct a comprehensive course revision, ensuring alignment between chapters and the course outline.

E. Program Activities

1. Student Counseling and Support

Activities Implemented	Brief Description*
Arrangements for availability of professors and teaching staff for individual student consultations and academic advice	All professors are expected to be available for one hour per week for office hours and one hour per week for classroom instruction.
Orientation meeting	The MCS program holds an orientation meeting for all new-registered students at the beginning of their study about the program study plan, PMAU and CCI regulations and policies, assessments and grades policy, PMAU E-services, .. etc.

Comment on Student Counseling and Support **

- Faculty members had post their contact information as well as office hours on Blackboard.

- All faculty had physical and virtual office hours each week where students contacted them via email, video conference, messages or by phone. Faculty were also available throughout the week and responded to students.

* including action time, number of participants, results and any other statistics.
** including performance evaluation on these activities

2. Professional Development Activities for Faculty and Other Staff

Activities Implemented	Brief Description*
Workshop Attendance	Whenever a new relevant conference or workshop is conducted, academic staff are encouraged to attend. During 2019/2020, two academic staff attended SEED Labs Bootcamp Style workshop.

Comment on Professional Development Activities for Faculty and Other Staff **

The faculty and supporting staff have the opportunity to pursue professional development of their teaching and research skills by joining different courses and workshops in quality and course assessment.

* including action time, number of participants, results and any other statistics.
** including performance evaluation on these activities

3. Research and Innovation

Activities Implemented	Brief Description*
Conference Participation	Academic staff and students are encouraged to attend conference and publish their research results in conferences and journals. During 2019-2020, 34 papers were published.

Comment on Research and Innovation **

From the numbers provided, this year's publications rate of published research per faculty member is satisfactory.

* including action time, number of participants, results and any other statistics.
** including performance evaluation on these activities

4. Community Partnership

Activities Implemented	Brief Description*
Agreement with companies and vendors	The college continuously look for partnerships and agreements with vendors. Recently an agreements was signed with IBM KSA.

Comment on Community Partnership **

The CCI College continuously look for partnerships and agreements with vendors.

* including action time, number of participants, results and any other statistics.
** including performance evaluation on these activities

5. Analysis of Program Activities

(including strengths, Areas for Improvement:, and priorities for improvement)

Strengths :

The dean of the CCI and other administrative staff held a meeting with students and discussed many topics regarding teaching and exams. Also, the issues that students faced during the semester were addressed by the dean.

Areas for Improvement:
The CCI College should work with the students affairs department to organize workshops for unemployed alumni.
Priorities for Improvement:
The CCI College should get evolve with alumni students regularly. Alumni unit should be activated.

F. Program Evaluation

1. Evaluation of Courses

Course Code	Course Title	Student Evaluation (Yes-No)	Other Evaluations (specify)	Developmental Recommendations
CS501	Research Methods in Computational Studies	Yes	N.A	clearer instructions about coursework at the beginning of the course. More practice on report writing, more practice in general. Project requirements should be clear from the start of semester, divided into phases, apply and evaluate different phases during the semester. Some of the requirements in the critical thinking and discussion were not clear. Decrease the content of each chapter, as there is some duplicate information. Virtual classes are suggested for the course as the face to face hours are not enough as the content are quite lengthy.

Course Code	Course Title	Student Evaluation (Yes-No)	Other Evaluations (specify)	Developmental Recommendations
CS507	Introduction to Cyber Security and Digital Crime	Yes	N.A	To enhance the learning experience, consider reducing the amount of class discussions and critical thinking activities. Introduce a laboratory component to provide practical hands-on experience. Additionally, consider adopting a textbook that is more accessible and reader-friendly. Students have expressed a positive response to the assignments given in the courses. To keep up with emerging technologies, ensure that the course materials are updated with relevant information. Female students appreciate materials that help them develop their knowledge and skills. However, some female students have mentioned that there is an excessive amount of information to cover.
CS512	Cryptography Fundamentals	Yes	N.A	Students like the course materials. However, they suggested to have a lab for this course and to have more examples.
CS564	Cyber Defense in Web Based Attacks	Yes	N.A	An individual project was given with thorough discussion. A group project could also be introduced.
CS566	Securing the Enterprise Infrastructure with Cyber Security Techniques	Yes	N.A	Some chapters are outside the course outline. A big revision should be conducted for this course. The course requires an elevated level of instruction and would benefit from the incorporation of additional laboratory sessions.

Course Code	Course Title	Student Evaluation (Yes-No)	Other Evaluations (specify)	Developmental Recommendations
CS663	Digital Forensics and Investigations	Yes	N.A	The textbook and course materials should be regularly reviewed and updated to reflect the latest developments and advancements in the field, ensuring their continued relevance and accessibility.

2. Students Evaluation of Program Quality

Evaluation Date : Semester 1: 18 Dec 2019 Semester 2: 22 Mai 2020	**Number of Participants:** 13 from 29 : 44.82%
Students Feedback	**Program Response**
Strengths: • The program increased the student ability to keep pace with development and meet the requirements of the labor market • The program developed the student self-learning ability and increased my desire for lifelong learning • The program enabled the student to take responsibility and prepare him/her to rely on them in their studies and life. • The program has improved the student communication skills and working effectively with groups • - The information about the program and its requirements was sufficient	The department continuously evaluates the courses and their contents to assure enabling students the ability to develop thinking and solving problems skills. In addition, the IT department evaluates the performance of faculty members and encourages them to establish good communication with the students and use technology effectively to deliver course content more efficiently
Areas for Improvement:: - The course activities	In the course activities we should increase the number of labs and prepare the students to pass certified exams.
Suggestions for improvement: **CS507** Reduce discussions and critical thinking activities. Add labs. Use a textbook that is easier to understand and read. Students likes assignments given in the courses. Update some information on new technologies. Female Students likes the materials which develop their knowledge and skills. Some female students think that there is too much information. **CS512**	 **CS507** The course offers a large set of technologies used in Cyber Security and Digital Crime. This field is evolving and technologies are introduced rapidly. This point should be considered in the new revision cycle of the course. In addition, I suggest to add lab to practice the theoretical concepts. **CS512**

Students like the course materials. However, they suggested to have a lab for this course and to have more examples.	The students are satisfied with the quality of the course. However, we should consider their recommendation about having more examples.
CS566 This course needs more live and professional lab with the face to face instructor. Increase the labs activities and adopt more advanced environment like cloud services to conduct the virtual lab. Re-design PowerPoint slides to cover the suggested topics in the syllabubs. Improve the course by selecting new textbook.	**CS566** More labs are needed for this course. Reduce the number of assessments will help students to focus more on the technical parts.
CS501 One comment from a student asking for clearer instructions about coursework at the beginning of the course. More practice on report writing, more practice in general. Project requirements should be clear from the start of semester, divided into phases, apply and evaluate different phases during the semester. Some of the requirements in the critical thinking and discussion were not clear. Decrease the content of each chapter, as there is some duplicate information. Virtual classes are suggested for the course as the face to face hours are not enough as the content are quite lengthy.	**CS501** The syllabus gives clear description of the required assignments, however, orientation at the program level could clarify things further. All assessment questions are clear enough to help students have the right skills. The content of the course is quite lengthy with less practical examples. It would be good if the course has a lab session to experiment the use of essential software tools for research such as citation and analysis tools.
CS663 Provide physical lab resources to students to practice the computer forensics. Need of hardcopy or softcopy of the textbook. Introduce virtual labs.	**CS663** Give access to students to practice computer forensics in a real lab. Assign a lab room and install the necessary machines for student practices. Improve the quality of the course materials. Purchase the textbook.
CS564 Some students suggested providing the books through the university in preferable prices.	**CS564** We hope the suggestion of offering the books can work to save the students.

* Attach report on the students evaluation of program quality

3. Other Evaluations

(e.g. Evaluations by independent reviewer, program advisory committee, and stakeholders (e.g., faculty members, alumni, and employers)

Evaluation method: NA	**Date:** NA	**Number of Participants:** NA
Summary of Evaluator Review		**Program Response**
Strengths: •		

•	
Points for Improvements:: • •	
Suggestions for improvement • •	

* Attach independent reviewer's report and stakeholders' survey reports (if any)

4. Key Performance Indicators (KPIs)

List the results of the program key performance indicators (including the key performance indicators required by the National Center for Academic Accreditation and evaluation)

No	KPI	Target Benchmark	Actual Value	Internal Benchmark	Analysis	New Target Benchmark
1	Percentage of achieved indicators of the program operational plan objectives	88%	100%	75%	Achieved	100%
2	Students' Evaluation of quality of learning experience in the program	4.0	3.86	**3.6**	Not achieved	4.0
3	Students' evaluation of the quality of the courses	4.0	4.1	**3.9**	Not achieved	4.5
4	Students' evaluation of the quality of scientific supervision	**4.2**	4.28	**4.1**	Not Achieved	4.5
5	Average time for students' graduation	**4**	4	**4**	Achieved	4
6	Rate of students dropping out of the program	10%	21.9%	**15%**	Not Achieved	10%
7	Graduates' employability	90%	93.5%	**88%**	Achieved	94%
8	Employers' evaluation of the program graduates' proficiency	4.3	4.4	**4.2**	Achieved	4.5
9	Students' satisfaction with the offered services	3.5	3.0	**2.5**	Not Achieved	3.5
10	Ratio of students to teaching staff	Less than 25 for male and female	Male : 6.2:1 Female: 3.3:1	Male : 5.6:1	Achieved	Less than 25 for male and female
11	Percentage of faculty members' distribution based on academic ranking	Assoc. Pro. = 25% Assist. Pro. = 70% Full Prof 5%	Assoc. Pro. = 26.7% Assist. Pro. = 73.3%	Assoc. Pro. = 8.3% Assist. Pro. = 91.7%	Achieved	Assoc. Pro. = 25% Assist. Pro. = 70% Full Prof 5%
12	Proportion of teaching staff leaving the program	1%	0% total (M 0%, F 0%)	0% total (M 0%, F 0%)	Achieved	**1%**
13	Satisfaction of beneficiaries with learning resources	4	4.5	**3.5**	Achieved	4
14	Satisfaction of beneficiaries with research facilities and equipment	4	4.7	**3.2**	achieved	4.8
15	Percentage of publications of faculty members	80%	86.6%	**80%**	achieved	90%
16	Rate of published research per faculty member	2.5:1	2.9:1	**1.05:1**	achieved	3:1
17	Citations rate in refereed journals per faculty member	10:1	11.9:1	**9.7:1**	achieved	12:1
18	Percentage of students' publication	Journals: 5% Conference: 5%	Journals: 0% Conference :4.8%	Journals: 0% Conference: 0%	Not achieved	Journals: 5% Conference :5%

19	Number of patents, innovative products, and awards of excellence	No. Patent: 5 No. awards:5	No. Patent: 0 No. awards:0	No. Patent: 0 No. awards:0	Not achieved	No. Patent: 5 No. awards:5

Comments on the Program KPIs and Benchmarks Results :

The actual values of several KPIs need to be improved.

5. Analysis of Program Evaluation

(including strengths, Areas for Improvement:, and priorities for improvement)

Strengths :

1. Great satisfaction in conduct of courses in blended learning environment.

Areas for Improvement:

-

Priorities for Improvement:

-

G. Difficulties and Challenges Faced Program Management

Difficulties and Challenges	Implications on the Program	Actions Taken
-	-	-

*Internal and external difficulties and challenges

H. Program Improvement Plan

No.	Priorities for Improvement	Actions	Action Responsibility	Date		Achievement Indicators	Target Benchmark
				Start	End		
1	Lab support for all courses requiring practical training at all levels of the graduate program	Provision of lab and hardware/ software support to faculty members responsible for delivering the courses.	Faculty members teaching in the master program	Sep. 2020	Aug. 2021	Number of courses have seed labs	3
2	Specializations courses during level 03 and 04 should be reviewed and more specialization tracks should be offered.	A review committee should be established to offer more specialization tracks and upgrade existing specialization courses content.	Faculty members teaching in the master program	May 2020	May 2021	Number of reviewed courses	3
3	Enhance the quality of slides and interactive lectures.	Revise and improve existing slides and lecture materials to enhance clarity, engagement, and visual appeal.	Faculty members teaching in the master program	May 2020	May 2021	Visually appealing and well-organized slides that effectively	3

						convey key concepts.	
4	Evaluate and consider adopting a more accessible and reader-friendly textbook	Establish a textbook evaluation committee, review available options, and select a textbook that is accessible, reader-friendly, and aligned with course requirements.	Faculty members teaching in the master program	May 2020	May 2021	Adopt a textbook that is easy to comprehend, well-structured, and student-friendly	3
5	Update course materials with information on new technologies.	Conduct a comprehensive review of the course materials, identify areas that require updates to incorporate new technologies, and revise or add relevant content to ensure the materials remain current and aligned with industry advancements.	Faculty members teaching in the master program	May 2020	May 2021	Updated course materials include the latest information and examples of new technologies.	3
6	Reduce the number of assessments to focus more on technical aspects.	Analyze current assessments, eliminate redundancies, and redistribute the weightage to prioritize technical proficiency.	Faculty members teaching in the master program	May 2020	May 2021	Balanced assessment plan that prioritizes technical skills and knowledge	3
7	Adjust course outcomes if a new textbook is selected.	Align course outcomes with the content and focus of the selected textbook, updating related materials, lectures, and assessments accordingly.	Faculty members teaching in the master program	May 2020	May 2021	Revised course outcomes aligned with the content and focus areas of the new textbook.	3

I. Report Approving Authority

Council / Committee	CCI Quality and Academic Accreditation Committee
Reference No.	01/2020
Date	8-September-2020

J. Attachments :

- **A separate cohort analysis report for male and female sections and for each branch**
- **A report on the program learning outcomes assessment results for male and female sections and for each branch (if any)**
- **A report on the students evaluation of program quality**
- **Independent reviewer's report and other survey reports (if any)**