# Program Specification

— (Postgraduate)

| | |
|---|---|
| **Program Name:** | **MS in Cybersecurity and Digital Forensics (CSDF)** |
| **Program Code** (as per the Saudi Standard Classification of Educational Levels and Specializations): | *Enter Program Code.* |
| **Qualification Level:** | M Sc. |
| **Department:** | INFORMATION TECHNOLOGY |
| **College:** | COLLEGE OF COMPUTER & INFORMATION SCIENCES |
| **Institution:** | Majmaah University |
| **Program Specification:** | New ☐    updated* ☒ |
| **Last Review Date:** | 15 Sept 2023 |

*Attach the previous version of the Program Specification.

# Table of Contents

## A. Program Identification and General Information:

**1. Program's Main Location:**

**MAJMAAH UNIVERSITY**

**2. Branches Offering the Program (if any):**

Main Campus of College of Computer and Information Sciences

**3. System of Study:**

☐ Coursework & Thesis          ☐ **Coursework** ✓

**4. Mode of Study:**

☐ **On Campus** ✓          ☐ Distance Education          ☐ Other ……………(specify)

**5. Partnerships with other parties (if any) and the nature of each: NA**

- Partnership Arrangement:
- Type of Partnership:
- Duration of Partnership:

**6. Professions/jobs for which students are qualified:**

- **Information Security Crime Investigator/Forensics Expert**
- **Cyber Security Project Manager**
- **Cybersecurity Analyst**
- **System, Network, and/or Web Penetration Tester**
- **Security Architect / Security Analyst**
- **Application Penetration Tester and Incident Responder**
- **Software / Application Development Security**
- **Disaster Recovery/Business Continuity Analyst/Manager**

**7. Relevant occupational/ Professional sectors:**

Cyber Security | Network Security | Ethical Hacking Incident Handling | Forensics Investigation

**8. Major Tracks/Pathways (if any):**

| Major track/pathway | Credit hours (For each track) | Professions/jobs (For each track) |
|---|---|---|
| 1.     N/A | | |
| 2. | | |

**9. Total credit hours:**

30 Hours

# B. Mission, Goals, and Program Learning Outcomes

## 1. Program Mission:

Prepare qualified national graduates with high skills and enough experience to join and engage into labour market in the fields of Cybersecurity and Digital Forensics by providing the graduates with the latest knowledge, exposure to innovative research and strong moral values to serve the community and Kingdom of Saudi Arabia.

## 2. Program Goals:

**The program goals are to produce graduates who can:**

1. Practice as computing professionals in areas of Cybersecurity and Digital Forensics with an appropriate combination of theoretical knowledge and hands-on skills.
2. Enhance their skills in wide aspects of the security of information systems and specialized skills in computer security incidents and crime evidence and master new computing technologies through self-directed professional development or conduct research in Cybersecurity and Digital Forensics field.
3. Follow a career path toward leading positions in the Cybersecurity and Digital Forensics field.

## 3. Program Learning Outcomes:*

### Knowledge and Understanding:

| K1 | An ability to understand a problem and identify the computing requirements appropriate to its solution |
|---|---|

### Skills:

| S1 | Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions |
|---|---|
| S2 | Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline |
| S3 | Communicate effectively in a variety of professional contexts |
| S4 | Identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems. |
| S5 | An ability to apply knowledge of computing and mathematics appropriate to the discipline |

### Values, Autonomy, and Responsibility:

| V1 | Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline |
|---|---|
| V2 | Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles |

## C. Curriculum:

### 1. Curriculum Structure:

| Program Structure | Required/ Elective | No. of courses | Credit Hours | Percentage |
|---|---|---|---|---|
| Course | Required | 5 | 15 | 50 |
| | Elective | 4 | 12 | 40 |
| Graduation Project (if any) | | 1 | 3 | 10 |
| Thesis (if any) | | | | |
| Field Experience(if any) | | | | |
| Others (.....) | | | | |
| Total | | 10 | 30 | 100 |

* Add a separated table for each track (if any).

### 2. Program Courses:

| Level | Course Code | Course Title | Required or Elective | Pre-Requisite Courses | Credit Hours | Type of requirements (Institution, College, or Program) |
|---|---|---|---|---|---|---|
| Level 1 | IT 601 | Cybersecurity Foundations | Required | N/A | 3 | Department |
| | IT 602 | Digital Forensics Technology and Practices | Required | N/A | 3 | Department |
| | IT 603 | Information Security Law, Policy, and Ethics | Required | N/A | 3 | Department |
| Level 2 | IT 604 | Cybersecurity Technology and Management | Required | N/A | 3 | Department |
| | IT 6XX | Elective- Group A | Elective | IT 601 | 3 | Department |
| | IT 6XX | Elective- Group B | Elective | IT 602 | 3 | Department |
| Level 3 | IT 605 | Research Methods and Engineering Statistics | Required | IT 604 | 3 | Department |
| | IT 6XX | Elective- Group A | Elective | N/A | 3 | Department |
| | IT 6XX | Elective- Group B | Elective | N/A | 3 | Department |
| Level 4 | IT 650 | Research Project | 3( 0, 0, 6) | IT 605 | 3 | Department |
| | | | | | | |

* Include additional levels (for three semesters option or if needed).
** Add a table for the courses of each track (if any)

## 3. Course Specifications:

Insert hyperlink for all course specifications using NCAAA template (T-104)

<div style="border:1px solid black;">

Link--- Please use updated Course Specification

</div>

## 4. Program learning Outcomes Mapping Matrix:

Align the program learning outcomes with program courses, according to the following desired levels of performance
*(I = Introduced      P = Practiced         M = Mastered).*

| Course code & No. | Program Learning Outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Knowledge and understanding | | | | | Skills | | | | | Values, Autonomy, and Responsibility | | |
| | K1 | K2 | K3 | --- | S1 | S2 | S3 | S4 | S5 | V1 | V2 | ---- |
| IT 601 Cybersecurity Foundations | I | | | | I | | | | | I | | |
| IT 602 Digital Forensics Technology and Practices | I | | | | I | | | | | | I | |
| IT 603 Information Security Law, Policy, and Ethics | I | | | | I | | | | | | I | |
| IT 604 Cybersecurity Technology and Management | P | | | | P | P | | | | | P | |
| IT 605 Research Methods and Engineering Statistics | M | | | | M | | | | | M | | |
| Electives | | | | | | | | | | | | |
| | K1 | | | | S1 | S2 | S3 | S4 | S5 | V1 | V2 | |

| Course code & No. | Program Learning Outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Knowledge and understanding | | | | | Skills | | | | Values, Autonomy, and Responsibility | | |
| | K1 | K2 | K3 | --- | S1 | S2 | S3 | S4 | S5 | V1 | V2 | ---- |
| IT 612 Malware and Vulnerability Analysis | P | | | | P | | | | | | | |
| IT 613 Cryptography and Cryptanalysis | P | | | | P | | | | | P | | |
| IT 614 Software Security | M | | | | M | | | | | | M | |
| IT 615 Penetration Testing and Ethical Hacking | M | | | | M | | | | | | | |
| IT 616 Special Topics in Cybersecurity | M | | | | M | | | | | | | |
| IT 621 Computer Forensics and Investigations | P | | | | P | | | | | | | |
| IT 622 Advanced Computer Forensics | M | | | | M | | | | | M | M | |
| IT 623 Mobile and Network Forensics | P | | | | P | | | | | | | |
| IT 624 Malware Development and Countermeasure | P | | | | P | | | | | | P | |

| Course code & No. | Knowledge and understanding | | | | | Skills | | | | Values, Autonomy, and Responsibility | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | K1 | K2 | K3 | --- | S1 | S2 | S3 | S4 | S5 | V1 | V2 | ---- |
| IT 625 Forensics Management of Digital Evidence | P | | | | P | | | | | P | P | |
| IT 626 Digital Forensics Response and Analysis | M | | | | M | | | | | | | |
| IT 627 Special Topics in Digital Forensics | M | | | | M | | | | | | | |
| IT 650 Research Project | M | | | | M | M | M | M | M | M | M | |

\* Add a separated table for each track (if any).

IT 650 Research Project Handbook ( Updated ) upload in Folder to be corrected and link required

## 5. Teaching and learning strategies applied to achieve program learning outcomes:

Describe teaching and learning strategies, to achieve the program learning outcomes in all areas.

Teaching Methods include: Interactive Classroom and lectures. Exercise and Assignment. Research projects. Class discussions. Lab training.

Learning Activities

On the other hand, the program conducts numerous curricular and extra-curricular activities,

such as:

Academic support committee for students to seek help and counseling for academic issues.

Workshops on subjects like Cyber Security, Cyber defense etc.

| NCAAA Category | NCAAA Code | SO Descriptor | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|

| | NCAAA Code | SO Descriptor | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| **Knowledge** | K1 | An ability to understand a problem and identify the computing requirements appropriate to its solution | Classroom Teaching | Class Test, Mid Exam, Final Exam |
| **Skills** | S1 | Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions | Classroom Teaching | Class Test, Mid Exam, Final Exam |
| | S2 | Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in thecontext of the program's Discipline | Mini Project, Lab Exercises | Lab Based Assignments, MiniProject |
| | S3 | Communicate effectively in a variety of professional contexts | Oral /Written Communication, Seminar | Group Assignments, Mini Project |
| | S4 | Identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems. [IT] | Mini Project, Graduation Project, Lab Exercises | Case Study Implementation/ Laboratory /Mini project |
| | S5 | An ability to apply knowledge of computing and mathematics appropriate to the discipline | Classroom Teaching | Class Test, Mid Exam, Final Exam |
| **Values** | V1 | Function effectively as a member or leader of a team engaged in activities appropriate to the program's Discipline | Mini Project, Graduation Project, Lab Exercises | Oral or Written Communication, Seminar |
| | V2 | Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles | Classroom Teaching, Graduation Project | Class Test, Mid Exam, Final Exam |

## 6. Assessment Methods for program learning outcomes:

Describe assessment methods (Direct and Indirect) that can be used to measure the achievement of program learning outcomes in all areas.

The program should devise a plan for assessing Program Learning Outcomes (all learning outcomes should be assessed at least once in the program's cycle).

| NCAAA Category | NCAAA Code | SO Descriptor | Teaching Strategies | Assessment Methods | |
|---|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Knowledge | K1 | An ability to understand a problem and identify the computing requirements appropriate to its solution | Classroom Teaching | Class Test, Mid Exam, Final Exam |
| Skills | S1 | Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions | Classroom Teaching | Class Test, Mid Exam, Final Exam |
| | S2 | Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in thecontext of the program's Discipline | Mini Project, Lab Exercises | Lab Based Assignments, MiniProject |
| | S3 | Communicate effectively in a variety of professional contexts | Oral /Written Communication, Seminar | Group Assignments, Mini Project |
| | S4 | Identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems. [IT] | Mini Project, Graduation Project, Lab Exercises | Case Study Implementation/ Laboratory /Mini project |
| | S5 | An ability to apply knowledge of computing and mathematics appropriate to the discipline | Classroom Teaching | Class Test, Mid Exam, Final Exam |
| Values | V1 | Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline | Mini Project, Graduation Project, Lab Exercises | Oral or Written Communication, Seminar |
| | V2 | Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles | Classroom Teaching, Graduation Project | Class Test, Mid Exam, Final Exam |

(PLO) Assessment process

The assessment of student outcomes is performed every semester through direct and indirect assessments. All student outcomes are considered to be attained when the average score reaches 70 % and above .Direct assessment:

o The assessment is performed on the defined assessment tools for all the courses. The assessment tools are provided in the course portfolio.

Indirect assessment:

o This is mainly used as a supplementary assessment measure and is done through the following surveys:

  ▪ Course surveys

  ▪ Summer internship survey

- Graduation project survey

- Exit survey

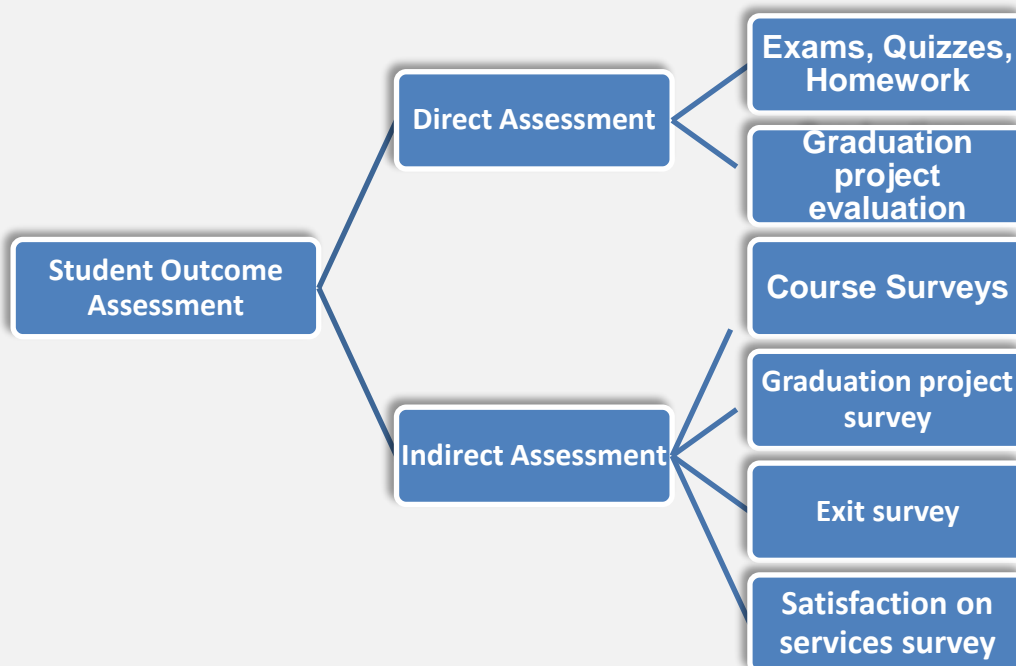Figurebelow, illustrates various direct and indirect assessment methods



Figure: Student outcomes assessment

assessment of student outcomes.

*Table:* below, describes the instruments that are used in direct and indirect assessment of student outcomes.

*Table: Students outcomes assessment tools – Direct and Indirect*

|  | Assessment Tool | Frequency | Media | How Collected | Source | Collected and evaluated by |
|---|---|---|---|---|---|---|
| Direct Assessment | Mid exam, Class test, Quiz, Assignment, Final Exam | Every Semester | Course Assessment Report | Electronic | Faculty Members | Quality Unit |
| Indirect Assessment | Course Surveys | Every Semester | Survey | Electronic | Faculty Members | Faculty Members |
| | Exit Surveys | Every Semester | Survey | Electronic | Quality Unit | Quality Unit |

| | Graduation Project Surveys | Every Semester | Survey | Electronic | Faculty Members | Graduation Project Coordinator |
|---|---|---|---|---|---|---|
| | Satisfaction Surveys | Every year | Survey | Electronic | Quality Unit | Summer Training and Employability Unit |

**Direct Assessment**

In the IT -MSCSDF program, each course targets a subset of the student outcomes with a certain percentage. These outcomes are directly assessed in every course using pieces of student work (questions in exam, homework, project, etc.,) Specific questions from the desired assessment tools are designed to assess a targeted outcome in the course. The designated level of performance (70% and above) indicates the achievement of PLOs in the course.

In every course, the faculty member is expected to assess the achievements of the relevant student outcomes in the course. The final assessment is preferably done close to the end of the semester.

The faculty member prepares a direct assessment report and evaluates the student outcome achievement in each course. If the assessment revealed any weaknesses in a specific student outcome, the faculty should identify the cause and propose corrective action plan that can be implemented in the course or in one of the prerequisite courses in order to improve that specific outcome achievement in the future.

The proposed corrective actions are implemented in the following semester and their impact on the specific outcome achievement shall be assessed.

The measurement and evaluation unit aggregate the outcomes achievement in all courses in MSCSDF program and computes the average score. If an outcome achievement appears to be unsatisfactory, the faculty member/department propose corrective action plan at the course level, the curriculum level, or both.

Different courses contribute to a specific outcome achievement at the program level depending on their number of credit hours and the percentage by which they target that specific outcome.

The student outcomes' assessment process is conducted every semester.

Each course instructor provides direct assessment reports and outcome evidences:

- o Brief description of the student works used to measure the achievement of student outcomes (assignments, projects, exams, etc.),
- o A description of which specific work is meant to assess which outcome.
- o Student outcomes achievement.
- o Analysis of the student outcomes achievements and identifying strengths and weaknesses.
- o Proposals to fix any identified weaknesses to be applied during the following semester.

- Samples of students' work.

The measurement and evaluation unit reviews the provided material and checks:

- to what extent did the students demonstrate they attained every outcome,
- whether the work evidence is appropriate for the assessment and
- the adequacy of the improvement proposals with regards to the identified improvement area.

The measurement and evaluation unit then writes a report to the quality unit with their findings. The findings are processed by the quality unit and forwarded to department.

The measurement and evaluation unit keeps track of the improvement proposals and checks the achieved improvement at the end of the following semester.

Indirect Assessment

The indirect assessment consists of the following processes:

- Course survey
- Graduation project survey
- Exit survey

The surveys are described in the following sections.

Course survey

Faculty are required to conduct course survey to assess the course learning outcomes(CLOs) achievement from the students' point of view.

Faculty members need to analyze the survey data in order to assess the achievement of the CLOs of their courses and consequently the student outcomes. The students' perception should also be discussed in the light of the direct assessment results obtained from students' work. Faculty write an indirect assessment report, where they identify issues and their causes (if any) and suggest corrective actions or improvements to be applied in the following semester. The assessment report is submitted to the measurement and evaluation unit to check adequacy of the proposed actions and follow up their implementation. All courses' surveys and their results are available with the faculty members.

Graduation project survey

After the students present their graduation projects, they are asked to fill in a survey to assess their project experience and outcomes. The graduation project coordinator analyzes the survey data and submits a report to the measurement and evaluation unit, where in which corrective actions may be suggested.

Exit survey

An exit survey is filled in by the graduates at the end of their graduation semester. The exit survey contains questions that directly target every one of the student outcomes. At the end of every semester, the survey data are analyzed by the measurement and evaluation unit and a report identifying weaknesses is produced and submitted to the department.

Based on the students' outcome direct and indirect assessment reports, the assessment will compute the program outcomes achievement at the program level. In addition to keeping track of the identified weaknesses at the course levels, the measurement and evaluation unit will identify weaknesses that may need a global corrective action at the program level. It may propose corrective actions to the accreditation and quality unit and department council. Those actions may relate to the curriculum by changing some courses or adding new ones in order for the IT program to better achieve the student outcomes.

Frequency of Assessment

The assessment frequency is detailed in Table: below

*Table: Assessment frequency*

| | |
|---|---|
| Formative | Every semester |
| Summative | |
| Course survey | |
| Graduation project survey | |
| Exit survey | |
| Satisfaction on services  survey | Every year |

Assessment Process

The assessment and evaluation of SOs of an individual course during the semester based on data collection is explained in detail.

1. Data Collection

   a) The direct assessment is evidence of student outcome. It is tangible, visible, measurable and tends to be more compelling evidence of exactly what students have and does not learned. The evidence of students' performance to determine what they've learned is available in the course portfolio.

   b) Indirect assessment evidences tend to be composed of proxy signs that students are probably learning. An example of indirect evidence is a survey through which asking students their self-report that what they have learned. This is evidence that students probably are learning what they report to have learned, but it is not as compelling as a faculty member looking at students' work. It is not uncommon in students' self-reports to either inflate or undervalue what they have learned.

c) Course assessment report is a consolidated evidence by the instructor of each and individual section. It contains the data collected from direct and indirect assessments, which were practiced during semester. The information is gathered using several instruments at regular intervals. For example, an exit survey is a data collection instrument that is used to gather information about the graduating students' opinion to measure the SOs achievement. These instruments are described in detail at later sections.

2. Data Preparation: The data preparation involves validation and transformation to make it ready for use in evaluation of PLOs. For example, the paper-based survey data is converted to electronic format. The illegible, incomplete, erroneous or duplicate submissions are discarded whenever necessary.

Evaluation Processes

1. Data Interpretation: Metrics are used to summarize data and its interpretation based on the points of interest. For example, the survey responses are used to calculate weighted averages scored of PLOs

2. Attainment Evaluation: The attainment of evaluation for all the PLOs are measured in this step. For example, the verification of the PLOs achievement from various data sources with reference to the threshold values (EE-Exceeding Expectation, ME-Meeting Expectation, PE-Progressing towards Expectation & DNME-Does Not Meet Expectation) are carried out.

3. Issue Analysis: Wherever the evaluation of targeted SOs are not achieved, an issue based deeper analysis is conducted. For example, reviewing faculty course assessment reports, discussing with faculty and students to determine underlying issues for poor achievement.

4. Improvement plan: An action plan is developed to remedy the identified issues and recommended implementation over the issue.
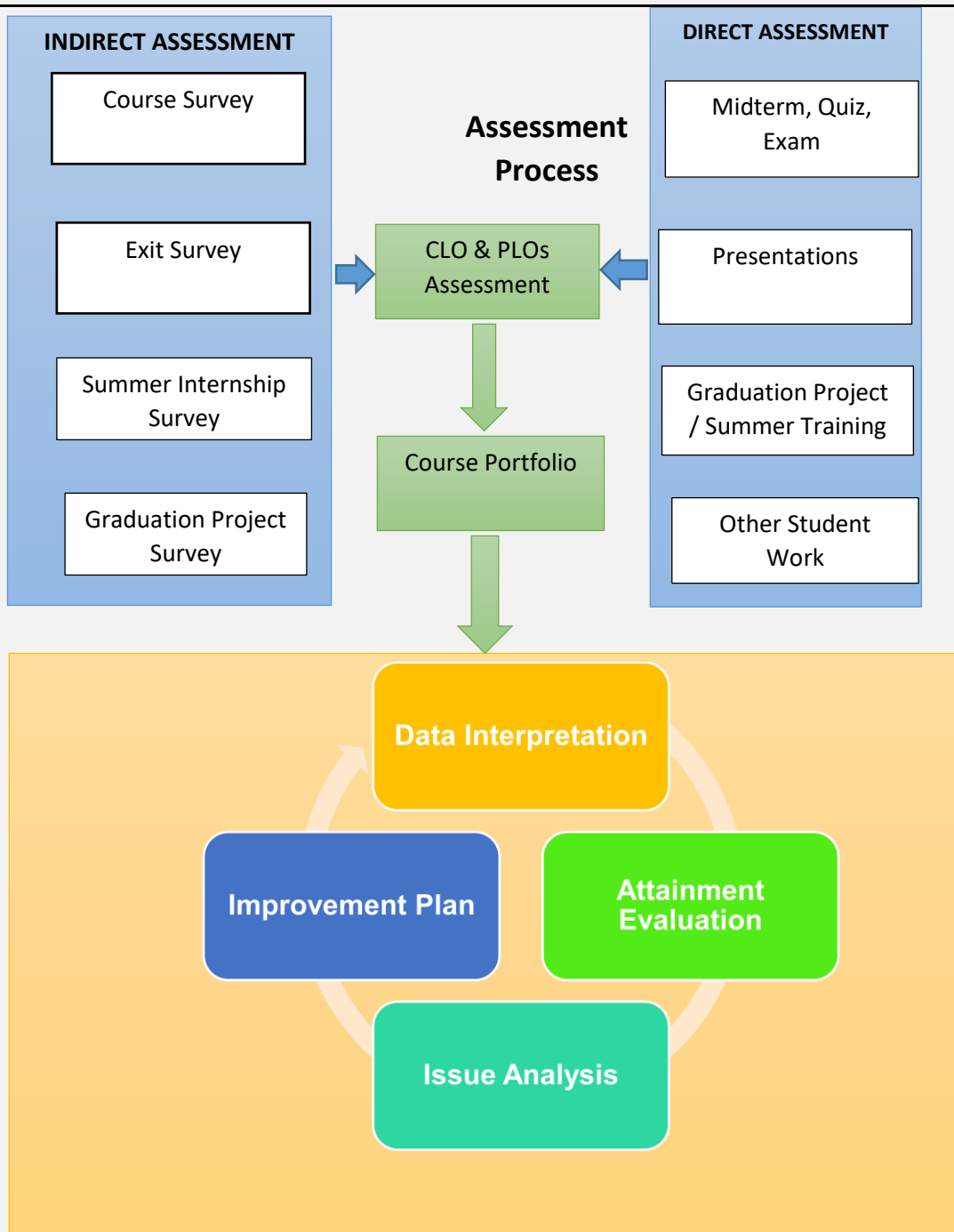
**INDIRECT ASSESSMENT**

Course Survey

Exit Survey

Summer Internship Survey

Graduation Project Survey

**Assessment Process**

CLO & PLOs Assessment

Course Portfolio

**DIRECT ASSESSMENT**

Midterm, Quiz, Exam

Presentations

Graduation Project / Summer Training

Other Student Work

Data Interpretation

Improvement Plan

Attainment Evaluation

Issue Analysis

Figure: Assessment and Evaluation Processes

**Expected levels**

The expected levels of satisfaction are defined as follows:

For direct assessment:

For direct assessment, when evaluating an outcome achievement using students' work, the evaluated outcome is considered to be attained, if the student achieved a score of 60% or above in the corresponding work.

Five levels of satisfaction have been defined:

- Excellent is given to a student whose score in a specific outcome is above 90%.
- Very Good is given to a student whose score in a specific outcome is between 80% and
- Good is given to a student whose score in a specific outcome is between 70% and 80%,
- Unsatisfactory is given to a student whose score in a specific outcome is less than 70%
-

For indirect assessment:

For indirect assessment (surveys), an outcome is considered to be attained if the student answer to the corresponding question is "Agree" or "Strongly Agree". Five levels of satisfaction have been defined:

- Excellent: corresponds to Strongly Agree in a specific outcome.
- Very Good corresponds to Agree in a specific outcome.
- Good: corresponds to Neutral in a specific outcome.
- Fair: corresponds to Disagree in a specific outcome.
- Unsatisfactory: corresponds to Strongly Disagree in a specific outcome.

# D. Thesis and Its Requirements (if any): N/A

## 1. Registration of the thesis:

(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)

## 2. Scientific Supervision:

(The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/ mechanisms of the scientific supervision and follow-up)

## 3.Thesis Defense/Examination:

(The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)

## H. Student Admission and Support:

### 1. Student Admission Requirements:

1. BS or BSc degree in Computing domain, such as CS, IT, IS, CE, or a related field (degree in other field is accepted only if candidate has either previous work experience or in-service training in IT, with coordinator's approval)
2. Grade-Point average (GPA) of at least 3.50 on a scale of 5.00 or equivalent.
3. Proof of English, Completion of TOEFL with minimum Score of 520 (PBT), 190 (CPT), or 68 (IBT)
4. At least two letters of Recommendations.
5. One motivation letter

### 2. Guidance and Orientation Programs for New Students:

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

- Orientation day is arranged for the newly admitted students ,to explain the important aspects of the university, college and the department and provide him/her with needed information to understand the program and department objectives..
- Workshops offered by the Different Units.

### 3. Student Counseling Services:

(Academic, professional, psychological and social)

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level)

- Academic Advising
- Career/ Professional Advising
- Psychological and social at University Level

**Role of the Academic Advising Unit**

- The goal of academic advising unit is to connect faculty members with students through following-up, guidance and observation of students academically. This process can be achieved through:

- 
- Welcoming the new students in their first day of the academic year, and notifying them of the University and College systems and the environments.
- Distributing the students according to their specialties all over the college staff.

- General supervising of Academic advisors and following up what are raised to him from student cases.
- Resolving the cases that are raised to him from academic advisors or raising them to the academic vice dean or the dean according to the situation.
- Organizing events and meetings with students at various levels related to academic advising.

## Enrollment Advising

The academic advising unit is primarily responsible for advising students prior to the start of each academic year. The unit allocates groups of students to faculty members, which, in turn, is recorded into the university's electronic registration system, EduGate. The student can see his/her advisor's name in the electronic registration system, and the advisor has access to the records of his/her advisees through the EduGate portal.

## Academic advisors

Academic advisors are meant to provide educational counseling for students. The academic advisor's primary responsibility is to evaluate the student's study plan to ensure it will satisfy university requirements while it meets each student's specific needs. To be effective, the advisor must recognize that each student has different abilities, interests, aspirations, needs, experiences, and problems so that his/her approach in dealing with students can be different from one to another. Academic advising cannot, therefore, be a mechanical, routine matter. To fulfill this requirement, the general advising duties can be stated as follows:

- Students are encouraged to meet with their academic advisors regularly during the semester for consultation and guidance. The relation between academic advisors and students can be summarized as follows:
- Revising and studying the student academic register, including the courses studied and his academic plan and its data. This is to ensure that each student comply with the study plan he/she enrolled in and to avoid delays in graduation
- Helping student in choosing the courses among his academic program.
- Following up the student continuously, and resolving the problems that may appear during his study.
- Raising statistical reports about the department students to the department chief.
- Preparing a complete file for each student advised by him, including his academic schedule, transcript, study plan and attendance during current semester.
- Academic advisors are requested to conduct group meeting with all students at the beginning of each semester.
- Advisors should regularly follow up student 4 times during the term to check his/her attendance and academic progress rate during fifth, eighth, eleventh and fourteenth weeks.

- Students can meet his advisors in other times during the semester to discuss any academic-related issues that may arise and be of concern to the study progress of any student.

After assigning an academic advisor for each student in the program, the student is required to meet his/her academic advisor for the purpose of registration based on his/her study plan, addressing any academic or career issues, and meeting graduation requirements. Each student has his/her own study plan based on the progress in his/her academic study and his/ her choice of the program's tracks. The student is required to maintain an updated study plan each semester to help him/her in choosing appropriate courses for registration in the following semester and to easily follow up the academic progress. The study plan is available for both students and academic advisors .

The student can add/drop courses during the first week of each semester after obtaining the permission from the academic advisor. The student is allowed to register up to 18 credit hours per semester but not less than 12. Exceptions to this rule can be made after getting the approval of academic advisor and Department Chair.

## Career Advising

Career advising is provided to the students through academic advisors, industry/governmental affiliates, experts in the fields, etc. and organized by the Academic Advising Unit.

## 4. Special Support:

(Low achievers, disabled, , and talented students).

The performance of the student in his/her courses is evaluated by the instructor using course assessment tools such as final exams, midterms, quizzes, homework, projects, reports etc. that fulfill the course/student outcomes. The instructors are invited to submit list of students who suffer difficulties in their classes to academic advisors. This will help the advisors to present assistance to those students in order to improve their performance in the class. In addition, students are encouraged to stop by their instructor's office during the office hours to discuss with them any concerns regarding the course. Special Care of low achievers, disabled, gifted and talented students by Academic Advisor.

## E. Faculty and Administrative Staff:

### 1. Needed Teaching and Administrative Staff:

| Academic Rank | Specialty | | Special Requirements / Skills (if any) | Required Numbers | | |
|---|---|---|---|---|---|---|
| | General | Specific | | M | F | T |
| **Professor** | IT | Cybersecurity | | 1 | 1 | 2 |
| **Associate Professor** | IT | Cybersecurity & Digital Forensics | | 2 | 2 | 4 |
| **Assistant Professor** | | | | | | |
| **Technicians and Laboratory Assistant** | | | | | | |
| **Administrative and Supportive Staff** | | | | | | |
| **Others (specify)** | | | | | | |

## F. Learning Resources, Facilities, and Equipment:

### 1. Learning Resources:

Learning resources required by the Program (textbooks, references, and e-learning resources and web-based resources, etc.)

- Under the supervision of the Deanship of Students' Affairs, the university provides aid to the students under the Students Fund Board through several programs; examples are students loans, students employment, and academic text books.
- All library needs (textbooks, e-books, journals, publications, periodicals, databases, etc.) are available through the central library.
- In addition, 10 laptops and 6 iPADs are available in innovation center to access Saudi Digital Library(SDL) containing access to several e-text books and journal papers.
- In addition, the college has provided (286) textbooks serving (29) titles from our offered courses.
- Student Information System (EduGate )-The Deanship of Admission and Registration provides an electronic services portal (EduGate) for students and faculty, through which, students can perform online registration, review their academic progress, view and print transcripts/grades, and monitor their absence rates. While instructors can monitor students under their academic advising, view their academic progress and results, insert marks and absences for students in their class, edit self-profiles, view their academic schedules.
Learning Management System – BLACK BOARD-The Deanship of E-Learning and Distance Learning is providing a learning management system BLACK BOARD to manage courses electronically and provide other possible learning opportunities to the students. It

provides not only an easy way for course material management, but also a way of communication between faculty, colleagues, and students through virtually any device connected to the Internet, anytime, anywhere.

## 2. Facilities and Equipment:

(Library, laboratories, classrooms, etc.)

Under the supervision of the Deanship of Students' Affairs, the university provides aid to the students under the Students Fund Board through several programs; examples are students loans, students employment, and academic text books.

• All library needs (textbooks, e-books, journals, publications, periodicals, databases, etc.) are available through the central library.

• In addition, 10 laptops and 6 iPADs are available in innovation center to access Saudi Digital Library(SDL) containing access to several e-text books and journal papers.

• In addition, the college has provided (286) textbooks serving (29) titles from our offered courses.

• Student Information System (EduGate )-The Deanship of Admission and Registration provides an electronic services portal (EduGate) for students and faculty, through which, students can perform online registration, review their academic progress, view and print transcripts/grades, and monitor their absence rates. While instructors can monitor students under their academic advising, view their academic progress and results, insert marks and absences for students in their class, edit self-profiles, view their academic schedules.

Learning Management System – BLACK BOARD-The Deanship of E-Learning and Distance Learning is providing a learning management system BLACK BOARD to manage courses electronically and provide other possible learning opportunities to the students. It provides not only an easy way for course material management, but also a way of communication between faculty, colleagues, and students through virtually any device connected to the Internet, anytime, anywhere.

## 2. Facilities and Equipment

## (Library, laboratories, medical facilities, classrooms, etc.).

The Information Technology Department's faculty offices are in the first floor which is shared with the other departments as well; Information Technology, Information Systems, and Computer Engineering departments. All other infrastructure (including classrooms, labs) are distributed among the rest of the building, which are also accessible to all departments. Attached to the Dean's office is a meeting room enough to hold up to 25 people and equipped with a modern teleconference/presentation facility to conduct national and international meetings and/or interviews.

In addition to the above, the building is equipped with four e-classrooms used to conduct seminars/workshops and/or classes between both male & female sides and equipped with two TV and camera sets and two desktop sharing screens with fast meeting capability. Also, a telepresence room attached to the Dean's office for meetings and interviewing new faculty

members. All internal communication is managed through IP phones. The building is equipped with (63) ready-use IP phones, but only (45) are used by faculty, TAs, and administrative staff.

## A. Offices, Classrooms and Laboratories

Offices (such as administrative, faculty, clerical, and teaching assistants) and any associated equipment that is typically available there.

1.The department main facilities reside in the first floor, which comprises the department head's office, department secretary, ten offices (four faculty, four TAs, and 2 shared offices for lecturers), one shared meeting room equipped with presentation facilities and enough to hold up to nine people, all offices are around 9´×9´ in size, equipped with large working desk area, book shelves, folders cabinet, chairs to conduct students' meetings, desktop (or laptop) computer with regular software installed (Windows, MS Office, etc.), office stationeries (messages keeper, stapler, puncher, pen holder), IP phone, wired and wireless Internet access, and air-conditioned. Most offices are also equipped with desk-size printers, in addition to a large shared networked printer in the same floor. All offices have access to fresh air and daylight. In addition, there are two large shared offices in the female side (33´×16´ and 23´×23´) for TAs (7 and 4 TAs, respectively).

Other shared resources are spread over the lobby and fourth floor include: six large displays for important announcements, rest area, general meeting room that can hold up to 90 people, prayer room, recreation area, and cafeteria. All the shared resources are air-conditioned and have access to fresh air and daylight.

2.    Classrooms -There are total twenty-three classrooms (12 for the male side and 11 for the female side) to conduct lectures distributed over the second and third floors shared between all the departments. Classrooms are of various sizes and capacities; they can accommodate students ranging from (15) up to (38) students each. All classrooms are equipped with presentation podiums, wired (dedicated to the podiums) and wireless Internet access, single students' chairs (right- and left-handed), and fully air-conditioned. All classrooms have access to fresh air and most of them have daylight access.

Four of the above classrooms are e-learning classrooms used mainly to conduct faculty seminars, general assembly meetings between male & female sections, and is used to communicate lectures to the female side in some courses. Classrooms projection walls are painted with ideal paint to make the wall interactive.

3.    Laboratory facilities including those containing computers (describe available hardware and software) and the associated tools and equipment that support instruction. Include those facilities used by students in the program even if they are not dedicated to the program and state the times they are available to students.

Five laboratories equipped with dual operating systems (Windows and Mac) are being used to conduct tutorials, experiments and/or lectures. Some of these labs are for special courses only while

the others are for general programming courses. In addition to five labs available in the female side for certain courses that require lab work.

Currently, the IT program has full access to Digital Forensics, Network, Computer Engineering, Database, and Operating Systems Labs totaling a capacity of (108) seats in addition to instructors' seats and a total of (121) seats in the female side in addition to instructors' seats. In addition, the innovation center is accessible to students for discussions and for using e-library from iPADs.

Some of the laboratories are utilized for research purposes as well as educational courses. They contain all necessary equipment, hardware, and software needed for faculty to conduct research in different areas, including:

- Digital Forensics, Cyber Security,Cloud Computing,Image Processing ,Network Security etc.

B. Computing Resources

A total of (8) servers, (13) switches, (2) core switches, (2) routers are used to manage the whole network of all labs, administrative staff offices, and faculty offices totaling (504) Ethernet nodes. In addition, a total of (28) wireless access points are distributed all over the CCIS facility as an open source for the students to access the Internet using their own usernames and passwords.

## 3. Procedures to ensure a healthy and safe learning environment:
(According to the nature of the program)

- Use and Update Labels and Signs One way of adhering to health and safety procedures, apart from the obvious aspect of providing safe and protective tools and equipment, is to use labels and signs.
- Provide Protective Equipment and Safe Tools.
- Implement Safety Protocols.
- Train The Staff Frequently.
- Encourage Open Communication

## G. Program Quality Assurance:

### 1. Program Quality Assurance System:
Provide a link to quality assurance manual.

Link

### 2. Program Quality Monitoring Procedures:

- Monitoring by Academic Follow-up Unit of CCIS.

- Reviewing faculty member course evaluation for all courses each semester.

- Reviewing student course evaluations for all courses each semester.

- Student interviews.

- Course file evaluation of the faculty members

## 3. Procedures to Monitor Quality of Courses Taught by other Departments: N/A

## 4. Procedures Used to Ensure the Consistency between within the main campus:

**N/A** (including male and female sections)**.**

## 5. Assessment Plan for Program Learning Outcomes (PLOs):

Attached

## 6. Program Evaluation Matrix:

| Evaluation Areas/Aspects | Evaluation Sources/References | Evaluation Methods | Evaluation Time |
|---|---|---|---|
| Facility | Students | Survey | Mid of semester and End of Semester |
| Leadership | Students | Survey | End of Semester |
| Effectiveness of Teaching | Students | Exams and Survey | Beginning of semesters, Mid of semester and End of Semester |
| Assessment (Direct) | Students | Exams | Beginning of semesters, Mid of semester and End of Semester |
| Assessment (In Direct) | Students | Survey | Mid of semester and End of Semester |

**Evaluation Areas/Aspects** (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)

**Evaluation Sources** (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others.

**Evaluation Methods** (e.g., Surveys, interviews, visits, etc.)

**Evaluation Time** (e.g., beginning of semesters, end of the academic year, etc.)

## 7. Program KPIs:*

### KEY PERFORMANCE INDICATOR (KPI)

The Master in cyber security & digital forensics (MSCSDF) has developed, based on its mission "Prepare qualified national graduates with high skills and enough experience to join and engage into labour market in the fields of Cybersecurity and Digital Forensics by providing the graduates with the latest knowledge, exposure to innovative research and strong moral values to serve the community and Kingdom of Saudi Arabia" an ambitious and well established strategic plan to achieve the mission and the strategic goals of the program, given a full consideration to the Saudi Vision 2030, the societal perspectives, and the accreditation requirements

In MSCSDF program 13 KPIs are measured which identified by the NCAAA, based on the collected statistics, to present evidence that program meets the expected quality assurance level. The KPIs tables includes a description and analysis of the results of each indicator with identification of strengths and aspects that need improvement. To measure the performance of MSCSD program, a committee of experienced faculty members was formed, to collect the relevant data from different sources and write the program specification, Annual report and measured the KPI.

### Methodology used to identify the Internal and External Benchmarking

A) KPIs' internal benchmarking: For the internal benchmarks, previous year actual KPIs values are reference points for the current year
B) The external benchmark is selected according to the following criteria:
1. The mode of study.
2. The accreditation and reputation of the program benchmark
3. The benchmark university offers similar specialization for the Master program ( Cyber Security & Digital Forensics)
4. The availability of benchmarking data.

### Setting up the new KPIs' target values the new target has been set for each KPI based on the following criteria:

• The analysis of the historical data and statistics collected from the college and Majmaah University entities.

The period to achieve the target (2023-2024) year(s).

KPIs' internal benchmarking: For the internal benchmarks, previous year actual KPIs values are reference points for the current year

The external benchmark is blank due to no availability of similar Master program (Cyber Security & Digital Forensics)  in KSU .

| Standard | Cod e | KPI | Description | Actual performance | Targeted performance level | Internal benchmark ( Previous Yr attainmen t | (External bench mark)* | New target performance level |
|---|---|---|---|---|---|---|---|---|
| -2- Teachi ng and Learni ng | KPI-PG-1 | Studen ts' Evaluat ion of quality of learnin g experie nce in the progra m | Average of overall rating of final year students for the quality of learning experience in the program on a five- point scale in an annual survey | | 4.5 | 4.1 | | 4.5 |
| | KPI-PG-2 | Studen ts' evaluat ion of the quality of the courses | Average students overall rating for the quality of courses on a five-point scale in an annual survey | | 4.5 | 4.4 | | 4.5 |
| | KPI-PG-3 | Studen ts' evaluat ion of the quality of acade mic supervi sion | Average students' overall rating of the quality of scientific supervision on a five- point scale in an annual survey. | | 100% | 100% | | 100% |

| | KPI | Indicator | Measurement | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **KPI-PG-4** | **Averag e time for studen ts' gradua tion** | Average time (in semesters) spent by students to graduate from the program. | | 2 years | 2 years | | 2 years |
| | **KPI-PG-5** | **Rate of studen ts droppi ng out of the progra m** | Percentage of students who did not complete the program to the total number of students in the same cohort. | | 10% | 21% (In First Semeste r) | | 10% |
| | **KPI-PG-6** | **Employ ers' evaluat ion of the progra m gradua tes' compet ency** | Average of overall rating of employers for the competency of the program graduates on a five point scale in an annual survey. | | 4 | 4 | | 4 |
| **-3- Stude nts** | **KPI-PG-7** | **Studen ts' satisfac tion with the provid ed service s** | Average of students' satisfaction rate with the various services provided by the program(food, transportatio n, sport facilities, academic advising,) an annual survey. | | **90%** | **60%** | | **90%** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| -4- FACUL TY MEM BERS | KPI-PG-8 | Ratio of studen ts to faculty membe rs | Ratio of the total number of students to the total number of full-time and full-time equivalent faculty members participating in the program. | | 6:1 | 6:1 | | 6:1 |
| -6- RESEA RCH AND PROJE CTS | KPI-PG-9 | Percen tage of publica tions of faculty membe rs | Percentage of faculty members participating in the program with at least one research publication during the year to total faculty members in the program. | | 60% | - | 100% | 60% |
| | KPI-PG-10 | Rate of publish ed researc h per faculty membe r | The average number of refereed and/or published research per each faculty member participating in the program during the year (total number of refereed and/or published research to the total number of faculty members during the year) | | 1 | 5 | | 1 |

| | KPI-PG-11 | Citations rate in refereed journals per faculty member | The average number of citations in refereed journals from published research (total number of citations in refereed journals from published research for faculty members to the total | | 3 | 3 | | 3 |
|---|---|---|---|---|---|---|---|---|
| | KPI-PG-12 | Percentage of students' publication | Published research (Percentage of students who : a. published their research in refereed journals b. presented papers in conferences to the total number of students in the program during the year. | | 100% | 75% | | 100% |
| | KPI-PG-13 | Number of patents, innovative products, and awards of excellence | Number of: a. Patents and innovative products National and international excellence awards obtained annually by the students and staff of the program. | | 1 | 1 | | 1 |

## H. Specification Approval Data:

| | |
|---|---|
| **Council / Committee** | IT –DEPARTMENT COUNCIL |
| **Reference No.** | 6 |
| **Date** | 1445-03-25 |

*Alodhyani*