Kingdom of Saudi Arabia
Ministry of Education
Prince Sattam bin Abdulaziz University
College of Computer Eng. & Sciences
Department of Computer Engineering

المملكة العربية السعودية
وزارة التعليم
جامعة الأمير سطام بن عبدالعزيز
كليـة هنـدسـة وعلـوم الحاسب
قسم هندسة الحاسب

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Policies Guide
for
Master of Engineering in Cybersecurity 2019-2021

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1. Introduction

The Kingdom's Vision 2030 came to draw a road map for the economic and development work of the Kingdom, and one of its most important goals is to build education that contributes to advancing the economy by bridging the gap between education outcomes and labor market requirements. In this regard, Prince Sattam bin Abdulaziz University has embarked on building academic programs that keep pace with developments and updates in various fields and specializations and are in line with national priorities and labor market requirements. The Master of Engineering in Cybersecurity program is considered one of the distinguished graduate programs that were prepared at the College of Engineering and Computer Science, as the admission of male and female students began in the academic year 1440-1441 H (2019-2020). This guide briefly describes the procedures for approving and amending the program and academic courses based on the articles of approval of postgraduate programs in the unified regulations for postgraduate studies, and its executive rules at Prince Sattam bin Abdulaziz University.

2. Postgraduate programs approval rules in the unified regulations for postgraduate studies

المادة السابعة:

يضع مجلس الجامعة المعايير التفصيلية لإقرار برامج الدراسات العليا بناءً على توصية مجلس عمادة الدراسات العليا مع مراعاة ما يأتي:

1- أن يكون قد توافر لدى القسم، العدد الكافي من أعضاء هيئة التدريس من الأساتذة والأساتذة المشاركين المتخصصين في مجال البرنامج، بالإضافة إلى توافر الإمكانات البحثية من معامل ومختبرات وتسهيلات الحاسوب وغيرها، وذلك لضمان نجاح البرنامج من حيث التدريس والإشراف والبحث.

2- أن يكون القسم قد اكتسب خبرة مناسبة على مستوى المرحلة الجامعية إن كان البرنامج لدرجة الماجستير، أو مرحلة الماجستير إن كان البرنامج لدرجة الدكتوراه.

3- أن يكون عدد الطالب المتوقع قبولهم في البرنامج مناسبا لضمان استمراريته.

المادة الثامنة:

مع مراعاة ما ورد في المادة (7) يتقدم القسم إلى مجلس الكلية بمشروع تفصيلي عن البرنامج يوضح فيه ما يأتي:

1- أهداف البرنامج ومدى احتياج المجتمع السعودي له.

2- طبيعة البرنامج من حيث تركيزه الأكاديمي والمهني ومنهجه العلمي.

3- أهمية البرنامج ومسوغات تقديمه، بعد الاطلاع على ما تقدمه الأقسام الأخرى داخل الجامعة أو الجامعات الأخرى في المملكة في مجال التخصص.

4- الإمكانات المتوافرة، أو المطلوب توافرها بالقسم لتقديم البرنامج على مستوى تعليمي ومهني رفيع، وبصفة خاصة تحديد المجالات البحثية الرئيسة بالقسم.

5- معدل استقرار هيئة التدريس بالقسم على مدى السنوات الخمس الماضية.

6- السير الذاتية والعلمية لأعضاء هيئة التدريس بالقسم، ولمن لهم صلة بمجال البرنامج في الجامعة.

المادة التاسعة:

يدرس مجلس عمادة الدراسات العليا مشروع البرنامج، ويتولى التنسيق بين متطلباته ومتطلبات البرامج الأخرى القائمة إن وجدت لتفادي الازدواجية فيما بينها، وفي حال اقتناعه يوصي به إلى مجلس الجامعة لاعتماده .

المادة العاشرة:

يكون التعديل في المقررات، أو متطلبات البرنامج، أو شروط القبول، بقرار من مجلس الجامعة بناءً على توصية مجلس عمادة الدراسات العليا بالتنسيق مع القسم المختص.

3. Mechanisms and Procedures for Designing and Developing the Program

Firstly: Forming a committee or work team for the program at the department level: the committee is formed from faculty members who are specialized in the program field as well as good experience in modern education methods and strategies, and designing programs, curricula, and courses.

Secondly: Studying the basis for creating or modifying and developing an academic program:

    a.   **Determining the reasons that led to the need to create a new program**: The committee studies and determines the reasons for creating a new program in the department, including:

        1. Guidance from inside or outside the university from those responsible for higher education or recommendations from various institutions need to develop new programs in the departments to meet the needs of the labor market.

        2. Studying and following up on new developments in modern scientific fields as well as research recommendations and studies in various fields.

        3. Studying the needs of the labor market and the increase in the unemployment rate among the graduates of the existing traditional programs.

    b. **Studying the reasons for modifying or developing an existing academic program at the university**: Among the most important of these reasons that lead to the modification of an existing academic program at the university are the following:

        1. Evaluation and periodic review of the program and the resulting recommendations or special proposals by the program.

        2. Opinions of the program advisory committee regarding approving the development and modification of the program according to the needs of the program society and the labor market.

        3. Recent developments in the field of the program in the scientific and technical aspects, as well as research and studies recommendations.

4. Labor market variables and available jobs considering changes in the program field.

5. Recommending the university or any outside institutions to develop the existing programs.

6. The results of program beneficiary opinions (the program graduates).

7. National development needs.

8. Academic accreditation requirements.

Through the previous study, the reasons that called for the development of an existing program or the creation of an existing program are determined. A new program with comprehensive reports prepared and presented to officials to make appropriate decisions regarding modifying or developing academic programs.

Thirdly: Formulating the program's mission, goals, and learning outcomes:

1. The mission of the program should explain what the program performs and who are the beneficiaries from the program and how to present the program in a realistic way.

2. The program learning outcomes (PLOs): determine what the student is expected to be able to perform after completing the academic program. Formulated in clear, measurable terms that focus on the learner's behavior and not the learning activity. The learning outcomes are in line with the requirements of the Saudi Qualifications Framework and with the standards academic, professional, and labor market needs.

Fourthly: Preparation of the study plan: Building study plans is one of the most important parts of the academic program, especially if it is to be built in light of quality standards, academic accreditation requirements and the Saudi Qualifications Framework. The preparation of the study plan includes the following:

1. Choosing courses.

2. Preparing a learning outcomes matrix at the program level.

3. Components of the study plan of the program.

4. Credit hours and teaching activities for the courses.

5. Coding and numbering the courses in the plan.

6. Preparing the program specification according to the National Center for Academic Accreditation and Assessment model.

7. Preparing course specifications for the program

8. Fulfilling program needs (laboratories, faculty members, equipment, technicians, classrooms, libraries and learning resources ... etc.)

9. Review and arbitration

	4. Program approval mechanisms and procedures			
Step no	Procedure	Tasks/Actions/Decisions	Regulations & Forms	Responsible Body/Unit
1	Preparation of the program proposal	– Determining the teaching requirements for the academic degree. – Determining the courses of the program, the number of credit hours for each course. – Distributing core and elective courses, and the research project. – Coding and describing each course of the program. – Presenting the program proposal to the Department Council for approval.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (8) القواعد التنفيذية للمادة الثامنة من لائحة الدراسات العليا (ت، ج، ح) – NCAAA program specification form. – NCAAA course specification form. – A request form for the creation of postgraduate programs. – A form for academic programs to adhere to the Saudi Standard Classification of Levels.	Department Program Committee

2	Approval of the program proposal at the department level	- Discussion of the program proposal. - Approval of the program proposal. - Submitting the draft program to the College Council.	- The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (8) القواعد التنفيذية للمادة الثامنة من لائحة الدراسات العليا (خ)	Department Council
3	Approval of the program proposal at the college level	- The draft program is reviewed by the Graduate Studies Unit/Committee (supervised by the Vice Dean for Graduate Studies at the College), and then it is presented to the College Council. - Approval of the program proposal. - Submitting the draft program to the Council of the Deanship of Postgraduate Studies according to the approved form.	- The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (8) القواعد التنفيذية للمادة الثامنة من لائحة الدراسات العليا (خ)	College Council
4	Study of the program proposal at the postgraduate deanship level	- The Permanent Committee for the Development of Postgraduate Studies Programs undertakes the study of the draft program in accordance with the rules and standards of the Unified Regulations for Postgraduate Studies.	- The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (9) القواعد التنفيذية للمادة التاسعة من لائحة الدراسات العليا (9-1، 9-2).	Council of the Deanship of Postgraduate Studies

		-After completing the required modifications to the program, the committee recommends it for submission to the Council of the Deanship of Postgraduate Studies. -The Council of the Dean of Postgraduate Studies recommends the draft program to the University Council for approval.		
5	Approval of the program	– Approval of the program.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (9) المادة التاسعة من لائحة الدراسات العليا.	University Council

		5. Program amendment mechanisms and procedures		
Step no	Procedure	Tasks/Actions/Decisions	Regulations & Forms	Responsible Body/Unit
1	Preparation of the program evaluation reports	– Preparing the necessary reports to evaluate the program periodically every five years as a maximum. - Analyzing the results of direct measurement of course learning outcomes and program learning outcomes, and preparing their own reports. – Analyzing the results of program stakeholder opinions and making the necessary reports. - Preparing the annual report of the program. - Formulating the justifications for modifying the program, if any. - Presenting program reports to the Department Council.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (10) القواعد التنفيذية للمادة العاشرة من لائحة الدراسات العليا (10-1) – NCAAA Annual Program Report – NCAAA Course Report – Self-assessment scales for postgraduate programs. – Self-study report for postgraduate programs.	Department Program Committee
2	Approval of periodic review reports for the program	- Discussing program reports. - Approval of program review reports and justifications for modification.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (10)	Department Council

				القواعد التنفيذية للمادة العاشرة من لائحة الدراسات العليا (10-3)	
		- Submit any modification in the courses, program requirements or admission requirements (if there is a need for an amendment in the courses, program requirements or admission requirements) to the College Council.			
3	Approval of program modifications	– The proposal to amend the program is reviewed by the Graduate Studies Unit/Committee (supervised by the Vice Dean for Postgraduate Studies at the College), and then it is presented to the College Council. – Adoption of the proposed modifications to the program. – Submitting the proposed program modifications to the Council of the Deanship of Postgraduate Studies, including the justifications for the request for modification.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (10) القواعد التنفيذية للمادة العاشرة من لائحة الدراسات العليا (10-3)	College Council
4	Study of the proposed program modifications at the postgraduate deanship level	– The Permanent Committee for the Development of Postgraduate Studies Programs undertakes the study of the proposed amendments to the program, their justifications, and the extent to which they can be presented to external arbitration bodies.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (10) القواعد التنفيذية للمادة العاشرة من لائحة الدراسات العليا (10-2)	Council of the Deanship of Postgraduate Studies

		– The Council of the Deanship of Postgraduate Studies recommends the proposed amendments to the program to the University Council for approval.		
5	Approval of the proposed modifications to the program	– Approval of the program modifications.	– The Unified Regulations for Postgraduate Studies in Saudi Universities - Executive rules (10) المادة العاشرة من لائحة الدراسات العليا	University Council

6. Mission, Goals & Program Learning Outcomes (PLOs)

Reasons for Establishing the Program

The program is urgently required to satisfy the following national needs:

1. Enhancing the Kingdom's national security related to cybersecurity using technologies and through skilled specialists in the field.

2. Transferring the concept of cybersecurity technology to students and researchers as well as transferring it to the community.

3. There is an urgent need for highly trained experts to enable them to carry out the mission of ensuring the safety and security of information in the various institutions of the Kingdom, whether governmental or private.

4. There is an urgent need to educate community members about the importance of security and how to secure data, information, and devices.

Program Mission

To provide a suitable environment for producing highly qualified Cybersecurity engineers, capable of solving security issues and assuming leadership to make significant contribution in knowledge society.

Program Goals

PG1: Provide graduates with an in-depth specialization knowledge in cybersecurity, selected from areas such as hardware security, network security and systems security.

PG2: Enhance the ability of graduates to succeed in dealing with the latest developments in the field, formulate solutions to address attacks, and plan for a secure world through cyber security.

PG3: Provide graduates with the necessary skills in Cybersecurity to contribute to enhancing the national security of the Kingdom of Saudi Arabia associated with cybersecurity through the adaptation of developed technologies.

PG4: Qualify graduates to pursue more postgraduate studies and scientific research in the field of cybersecurity.

Program Learning Outcomes (PLOs)	
Knowledge and Understanding	
K1	Describe complex computing problems related to cybersecurity.
K2	Recognize the principles of computing applications and optimum security solutions.
Skills	
S1	Implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of cybersecurity.
S2	Apply security principles and practices to maintain operations in the presence of risks and threats.
Values	
V1	Communicate effectively in a variety of professional contexts.
V2	Respect professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V3	Function effectively as a member or leader of a team engaged in activities appropriate to cybersecurity.

Assessment Plan for Program Learning Outcomes (PLOs)

The Assessment Plan for Program Learning Outcomes (PLOs) rely on direct and indirect assessments. The following table illustrates the scheduling for a complete cycle of PLOs using direct measurements based on Course Learning Outcomes (CLOs) of the program core courses. As seen the cycle consists of 4 levels (semesters) or 2 years, where at the end of each semester the contribution of all offered courses to the relevant PLOs will be computed.

Domain	PLO	First Year				Second Year	
		1st Level			2nd Level	3rd Level	4th Level
		CE600	CS651	CE603	CE602	CS617	CE616
Knowledge	K1			■ (pink)	■ (blue)	■ (green)	
	K2	■ (pink)	■ (pink)	■ (pink)	■ (blue)		
Skills	S1			■ (pink)	■ (blue)	■ (green)	■ (red)
	S2			■ (pink)	■ (blue)	■ (green)	■ (red)
Values	V1		■ (pink)			■ (green)	■ (red)
	V2	■ (pink)				■ (green)	■ (red)
	V3	■ (pink)	■ (pink)	■ (pink)			

- A colored cell in each course column indicates that course contributes to the corresponding PLO.
- Each course effectively contributes to 3 to 5 PLOs, and each PLO directly measured by 3 to 4 courses.
- Direct assessment of two PLOs (K2 and V3) is completed by end of the 1st year, while the assessment of the remaining PLOs will be completed by end of the 2nd year.
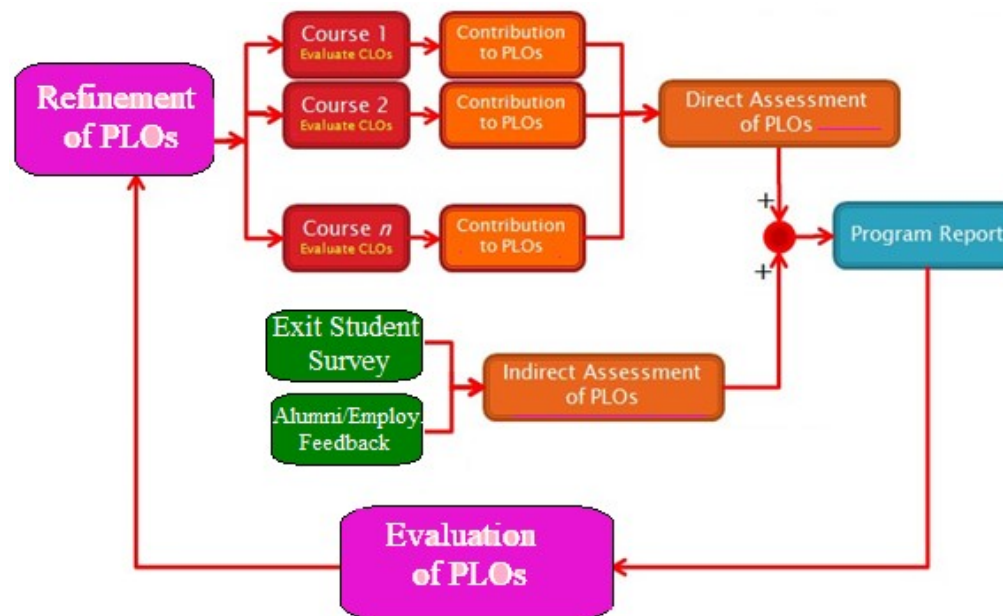
- On the other hand, the indirect assessment can be accomplished through a PLOs survey that will be conducted to exit students at the end of the last semester. Also, feedback from alumni and employers can be considered in the assessment and evaluation process after one year from time of graduation or employment.

Using of PLOs Assessment Results in the Development Processes

At the end of the program cycle the overall core courses contributions to all PLOs together with the indirect results will be reported, discussed, and used in the development processes as shown in the following figure.

Thus, the direct and indirect assessment results of all PLOs can be reported within the program cycle (2 years). The program report can be discussed and evaluated by the Curriculum and Assessment Committee (CAC), which may prepare an action plan. The action plan will be approved by the Department Council and hence used as feedback for developing and improving the program in the next cycle.

Forms and Templates	Link & Content
Program Development	**https://dps.psau.edu.sa/ar/content/2021–12–08** – **Program Specification** (NCAAA) – **Course Specification** (NCAAA) – نموذج طلب استحداث برامج دراسات عليا (نموذج رقم 1) – SASCED–20– مدى تقيد البرامج الأكاديمية بالتصنيف السعودي الموحد للمستويات والتخصصات نموذج داخلي للجامعة: التعليمية
Program Amendment	**https://etec.gov.sa/en/productsandservices/NCAAA/AccreditationProgrammatic/Pages/graduateprograms.aspx** **Standards for Postgraduate Program Accreditation** **Self–Evaluation Scales for Postgraduate Programs** **Self–Study Report for Postgraduate Programs** **Program Key Performance Indicators** **Annual program Report** **Course Report**

9– Program related regulations and guides	
Guide/Regulation	**Link**
Study Plan and Course Description of the Master of Engineering in Cybersecurity	https://dps.psau.edu.sa/sitesuploads/dps/page/2020–12/0_السيبراني20%الامن20%في20%الهندسة20%ماجستير20%وتوصيف20%خطة.pdf
Masters' Program Guide for the Academic Year 1442 H	https://dps.psau.edu.sa/sitesuploads/dps/prints2021–02/هـ20%201442للعام20%الجامعي20%العليا20%الدراسات20%برامج20%دليل.pdf
The unified regulations for postgraduate studies in Saudi universities and their executive rules at Prince Sattam bin Abdulaziz University 1439-1440 H	https://dps.psau.edu.sa/sitesuploads/dps/prints2021–02/سلمان20%بجامعة20%وقواعدها20%العليا20%الدراسات20%لائحة.pdf

Regulations for study and examinations for the undergraduate level and the executive rules	https://dar.psau.edu.sa/sitesuploads/dar/node/7164/%2020%الدراسة.com pressed.pdf
Research writing guide	https://dps.psau.edu.sa/sitesuploads/dps/prints2021–02/دليل%20كتابة%20البحث%20العلمي.pdf