Curriculum Review and Development Manual

College of Computer Science

King Khalid University

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1.   Executive Summary

This document presents the "Curriculum Review and Development Manual" for the College of Computer Science at King Khalid University. It outlines a structured approach to maintaining and enhancing the academic curriculum to ensure it meets current industry standards, responds to technological advancements, and aligns with the strategic goals of the institution. The manual establishes clear guidelines for curriculum governance, detailing the roles of various committees and stakeholders involved in the review and development process.

The document differentiates between minor and major curriculum revisions. Minor revisions, implemented each semester, involve updates to course content, references, and assessment methods to keep the curriculum relevant. Major revisions, occurring every four to five years, involve substantial changes such as redesigning the curriculum structure, introducing new courses, and revising pedagogical approaches. These revisions are subject to a rigorous approval process, involving internal and external reviews to ensure quality and alignment with academic and industry standards.

The manual also outlines a systematic review cycle, which includes short-term, medium-term, and long-term reviews, each serving to maintain the curriculum's relevance and effectiveness. The curriculum development process includes phases such as assessment, benchmarking, redesign, stakeholder feedback, implementation, and final approval, ensuring a comprehensive approach to curriculum enhancement.

Overall, the manual provides a detailed framework for continuous improvement in the curriculum, aiming to enhance educational outcomes and ensure that academic programs meet the needs of students, employers, and the broader community.

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2. Overview

In today's rapidly evolving educational landscape, maintaining a dynamic and relevant curriculum is essential for preparing students to meet the challenges of the modern world. This Curriculum Revision Policy is designed to ensure that our academic programs remain current, rigorous, and aligned with both industry standards and the institution's strategic goals. By systematically reviewing and updating our curriculum, we strive to provide students with high-quality educational experiences that foster critical thinking, innovation, and lifelong learning.

In response to the requirements of growth and development driven by the national development plans of the Kingdom of Saudi Arabia, it is necessary to continuously develop the study plan to enrich society from scientific aspects. Hence, this policy has been developed to guide the creation and development of study plans. From this standpoint, the policy regulates the procedures for creating and developing study plans, ensuring consistency and alignment with higher education regulations.

This policy was built with reference to the **Permanent University Curriculum & Plans Committee** [Link], and the **Permanent Committee for Graduate Studies Programs and Study Plans** [Link]. It follows the official framework of the Procedures to be followed in case of major or minor modifications to study plans and curricula, thereby ensuring compliance with national and institutional standards.

The policy outlines the principles, processes, and timelines for curriculum development and revision (minor and major revisions). It establishes a structured framework for continuous improvement, encouraging active participation from faculty, students, and stakeholders.

By adhering to this policy, we aim to foster a culture of continuous improvement and innovation, ensuring that our curriculum remains responsive to advancements in knowledge, technology, and pedagogy. This policy serves as a guide for all stakeholders involved in the curriculum update process, providing clear guidelines and procedures to support the development and implementation of curriculum changes that enhance the educational experiences and outcomes for our students.

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The main goals of the Curriculum Review and Development Policy are as follows:

1. To establish a clear guide for periodically reviewing and developing the curriculum.

2. To contribute to the assurance and enhancement of curriculum quality.

3. To define the timeframe for regular curriculum reviews and/or new curriculum developments.

4. To standardize the administrative procedures required for approving curriculum modifications.

This document is divided into three parts:

1. Roles and Responsibilities in Curriculum Governance.
2. The policies for minor and major changes.
3. Curriculum Development Process.

3. Roles and Responsibilities in Curriculum Governance.

The organising committees/councils for curriculum development are:

a) *Curriculum and Study Plan Committee*: This committee is formed at the beginning of each year by the Head of Department. The committee consists of PhD-holder faculty members with different computer science specialisations. Members of the committee are responsible for designing and reviewing Curriculum in line with the policy development guidelines.

b) *Academic Development and Quality Committee (ADQC)*: This committee is responsible for carrying out required revision on the changes made to the courses/curriculum to ensure it meets the quality guidelines.

c) The *Head of the Department (HoD)* holds the leadership and authority to guide academic staff in curriculum development and decision-making processes. He/she is responsible for overseeing revisions within the department. The head should appoint a chair and members to the curriculum revision committee and ensure that the committee designs and reviews Curriculum in accordance with policy development guidelines.

d) *Department Council*: The Department Council plays a crucial role in the curriculum update process by providing oversight, ensuring alignment with standard academic requirements and benchmarking.

e) *College Curriculum Committee*: serves as the central academic body that reviews and consolidates departmental curriculum proposals, ensuring alignment with college strategy, quality standards, and accreditation requirements before forwarding them to the College Council and higher university bodies.

f) *College Council*: The College Council plays a pivotal role in overseeing and guiding the curriculum update process within the college. It is responsible for ensuring that curriculum

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changes align with the college's strategic goals, standard academic requirements, and job market needs.

g) The *Permanent University Curriculum and Plan Committee*: This committee confirms that all modifications meet the university policies for modifying Curriculum and then sends the document to the next level.

h) *University Council*: It approves the developed /revised curriculum.

4. Curriculum Revision Types and Review Cycle

- **Curriculum Review Types:** Based on the processes discussed in the previous section, curriculum updates might require two types of revision as follows:

a) Minor Revision

Minor revisions are adjustments that fine-tune existing Curriculum without fundamentally altering the program's structure or objectives. These revisions often include updates to course content, references' lists, assessment methods, and instructional materials to reflect the latest developments in the field and feedback from students and faculty, and it is implemented after each semester as shown in Section 5.

Minor revision should be undertaken at the *Permanent University Curriculum and Plan level*, and it includes the following:

1. Clarifying or adjusting course learning outcomes without altering approved program outcomes.
2. Adding or modifying course requirements or credit hours.
3. Changing the sequence of courses in a study plan.
4. Changing course topics, teaching activities, or assessment methods.
5. Updating the course description.
6. Adding or deleting some references or textbooks.
7. Modifying requirements for training or graduation projects

b) Major Revision

As part of the program review, a curriculum review is also carried out every four years (one batch of graduate students completed the program) by the department Study Plan & Curriculum committee. Major revision requires external reviewers, and approval from the concerned committees and department, college, and university levels, as it involves substantial changes that significantly impact

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the curriculum's structure and content. For a comprehensive overview of the entire curriculum development process, please refer to Section 5.

Major revision includes the following:

1. Establishing or developing a new academic program.

2. Changing the name of a program.

3. Modifying the mission and objectives of a program.

4. Updating the program specification.

5. Adding, deleting, or merging a major specialization.

6. Modifying the main learning outcomes of a program.

Major revision should be undertaken at the departmental, college and university levels.

- **Curriculum Reviewing Cycles:** Curriculum review cycles are essential for maintaining the relevance and quality of educational programs. By systematically evaluating and updating Curriculum through these cycles, institutions can ensure that their programs meet the evolving needs of students, employers, and the broader community. Regular, structured review processes also help institutions remain competitive and compliant with accreditation standards, fostering a culture of continuous improvement in education. Table 1 shows the Curriculum review cycle that is followed by the college.

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Table 1: Curriculum Review Cycles

	Short-Term Cycle (Each semester)	Medium-Term Cycle (2 year)	Long-Term Cycle (4/5 years)
Objectives	Minor revision	Major revision	Major revision
Triggers	Course report review	Annual program report review or any emerging issues	Strategic scheduled Review
Timelines	End of the semester	Every two years	Every fourth/fifth year
Processes	Continuous course improvement process	Curriculum development	Curriculum development
Approval Responsibility	Department. Council	Department Council College Council	Department Council College Council

5. Curriculum Development Process

The curriculum development process is a systematic and organised approach for designing, implementing, evaluating, and revising educational programs. The process ensures that a curriculum aligns with program objectives and learning outcomes, meets the needs of job markets, and reflects current standard academic requirements, such as NCAAA, ABET, and ACM. The stages in curriculum development process are shown in Figure 3 and Table 2:

Table 2: Curriculum Development Stages

Assess	Evaluate the existing curriculum to identify areas for improvement.
Review with benchmarking	Compare the current program with national, regional, and international universities and educational standards.
Implement	Redesign the curriculum to address identified areas for improvement.
Monitor	Assess the effectiveness of the changes made to the curriculum over time.

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The process of developing a current curriculum is carried out by the Curriculum and Study Plan Committee, and they follow the phases shown in Figure 3, and are as follows:
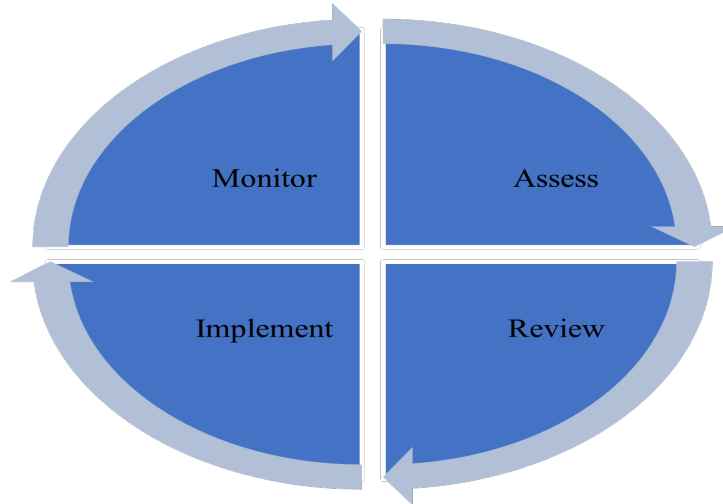

Figure 3: Curriculum Development Stages

- Phase 1: Assessment of the Current Curriculum
- Phase 2: Benchmarking
- Phase 3: Curriculum Re-design
- Phase 4: Stakeholder/External Reviewer Feedback
- Phase 5: Implementation of the Final Updated Curriculum
- Phase 6: Program Approval

5.1. Assessment of Current Curriculum

To properly assess the current program and study plan, it is helpful to consider several key factors that can influence its effectiveness and efficiency:

a- **Reviewing the Program**: Examine the current curriculum, syllabi, teaching materials, and assessment methods. Make sure that the program meets the following criteria:
- Alignment with current standards and practices.
- Relevance of course content and learning outcomes.
- Effectiveness of teaching methodologies and technologies.

b- **Gathering Feedback**: Analyse feedback on the current curriculum based on survey responses from various stakeholders:
- Student Course Evaluations,
- Alumni,
- Faculty Members,

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- Industry Partners.

c- **Evaluate Students' Performance**: Investigate the students' performance through course assessments, such as exam scores, as well as project outcome, course learning outcome, and program learning outcome measurements. Such performance measures will indicate if there is a gap in the course teaching strategies and identify areas where the curriculum may need to be adjusted to align with the desired learning outcomes.

d- **Graduation and Retention Rates**: Graduation and retention rates provide valuable insights into the effectiveness of a curriculum and play a vital role in guiding curriculum redesign efforts to better serve students, improve educational quality, and enhance institutional reputation and accountability. High graduation and retention rates often indicate that students find the curriculum engaging, relevant, and meaningful to their academic and career goals. Conversely, low rates may suggest that the curriculum needs adjustment to better meet students' needs and interests.

e- **Analyse Data and Identify Areas for Improvement**: Consolidate all the collected data and insights to identify key areas for improvement.

5.2 Benchmarking

Benchmarking is a powerful tool for enhancing learning outcomes and optimizing educational strategies. It plays an important role in enhancing student performance by supporting the adoption of best practices, helping students achieve better academic outcomes. Benchmarking also improves engagement with other institutions, and it is a good opportunity to gain exposure to different approaches that can inspire innovative teaching methods and educational tools.

Benchmarking involves the following:

❖ Identify Benchmarking Partners:

Benchmarking programs will be selected based on the following:

a- Identify top-ranked international universities, for example, based on QS rankings as well as leading BSc Computer Science Fields' programs.

b- Identify top national BSc Computer Science Fields' programs.

c- Full compliance with the requirements specified in the Saudi Unified Classification for educational levels and specialisations.

d- The alignment with the Jahiziah Project (جاهزية) from the National Centre for Academic Accreditation and Evaluation, which aims to enhance the readiness of higher education graduates for the job market.

e- Ensure alignment with the NCAAA Consistency with National Qualifications Framework (Level 6 and 7).

f- Incorporate standards such as ABET, ACM, The Saudi Cybersecurity Higher Education Framework, and/or EDISON Data Science Framework, when redesigning a curriculum, it is essential to consider both international and national standards to

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ensure quality and relevance, thus ensuring that the redesigned curriculum meets not only local requirements but also global best practices in education.

❖ **Collect and Analyse Data and Identify Areas for Improvement:**

Analyse the data from the current study plan in comparison to the selected benchmarking partners. Examine the study plan design, courses, teaching strategies, and resources used to identify gaps between the current study plan and the selected universities. This can be done through the following:

a- Construct a matrix to identify the consistency in learning outcomes between the national framework of qualifications, benchmarking, and the learning outcomes of the program target using the template matrix in Form 2 of the university curriculum development guidebook.

b- Compare the study plan's structure, organization, and courses with those of the chosen university.

c- Identify resources and teaching strategies used in other universities.

d- Identify the gap based on the report results, taking this into account when revising the program's learning outcomes, selecting coursework, field training, and other educational activities to bridge the gap.

5.3 Curriculum Redesign:

Based on the insights gained from reviewing the current curriculum, collecting survey results, evaluating student performance, and benchmarking, the committee shall plan and implement changes to align with best practices. Tailor these practices to fit the program's goals, KPIs, desired learning outcomes, and job market needs.

❖ *Curriculum redesign involves a comprehensive process that includes the following:*
  ❖ Revising course content and materials to ensure they are up to date and relevant.
  ❖ Introducing new teaching methods or technologies to enhance learning.
  ❖ Adjusting assessment methods to better measure student learning and outcomes.
  ❖ Ensuring consistency with qualification frameworks and curriculum guidelines, such as SAQF, NCAAA, ABET, and IEEE/ACM.

When developing the curriculum the following criteria should be considered:

- Ensure alignment with the NCAAA Consistency with National Qualifications Framework (Level 6 and 7).

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- Consider the university's strategic goals in the development of academic programs.
- The courses to be offered/updated are identified and structured according to the program/students' learning outcomes.
- The credit hours for each semester should be in the range of 15 to 20 credit hours for full-time study as per the university curriculum development guidebook.
- Prerequisite courses are to be fully considered for relevant courses to ensure effective and progressive learning development.
- A capstone design project is a necessary required course that should be kept in the study plan.
- Elective courses can be added to the study plan depending on the various tracks offered by the program.
- The modernity of the core references for the courses.
- The course codes are framed as suggested by the university curriculum development guidebook.

5.4 Stakeholder/External Reviewer Feedback:

It is important to ensure that any changes are well documented and communicated to all stakeholders to maintain transparency. Gathering and analysing feedback from stakeholders is a crucial part of assessing the effectiveness of improvements made to a study plan. Surveyed stakeholders typically include the following:

- ❖ Faculty
- ❖ Employers
- ❖ Academic scholars
- ❖ Alumni

The perspectives of these stakeholders can provide invaluable insights into how well the changes are mapped with the program PLOs and meet current job market needs and expectations.

5.5 Implementation of the Final Updated Curriculum:

Analyse all feedback, evaluation results, and recommendations gathered throughout the process and incorporate stakeholders' perspectives and suggestions into the curriculum redesign process to ensure alignment with diverse needs and expectations.

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5.6 Program Approval:

The major changes in the BSc curriculum and study plans should follow the following procedures:

1. The "Study Plans and Curriculum" Committee of the department submits the updated curriculum plan to ADQC to review quality aspects of the proposed amendments.

2. The "Study Plans and Curriculum" Committee of the department submits the curriculum plan to the Department Council for review and to suggest any necessary amendments.

3. The Department Council reviews the curriculum plan, and if there are any amendments or comments, it is returned to the Committee.

3. After the Department Council recommends approval of the curriculum plan in its final version, it is sent to the "Study Plans and Curriculum" Committee at the college level for review to ensure compliance with the standards of the Education and Training Evaluation Commission and that all previous stages have been met.

4. The plan is then presented to the College Council for discussion and recommendation, either to forward it to the "Permanent University Curriculum and Plan Committee" or to return it to the college's "Study Plans and Curriculum" Committee with a list of comments and suggestions for further revision by the department.

5. After the plan is approved by the College Council, it is sent to the Permanent University Curriculum and Plan Committee at the University's Educational Affairs Vice-Presidency, where it is reviewed by the "Permanent Committee for Plans and Curriculum" to ensure it meets the standards and general conditions according to the Saudi Qualifications Framework, the requirements of the Education and Training Evaluation Commission, and takes into account the university's strategic plan and Vision 2030. The plan is then either approved or returned to the college's "Study Plans and Curriculum" Committee with reasons for the decision.

6. If the Permanent Committee for Plans and Curriculum at the university recommends approval of the curriculum plan, it is forwarded to the University Council Secretariat for final approval or return to the committee with justifications.

7. If the University Council approves the curriculum plan, after verifying that all procedures and requirements for the plan's development are met, the plan becomes a binding

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document. All relevant departments and colleges within the university offering the same program must implement it exactly as approved by the University Council without any modifications.

Table 3 outlines the procedures involved in curriculum and study plan minor and major changes for the BSc programs, as specified in the Curriculum and Study Plan Update Policy issued by the Permanent University Curriculum & Plans Committee [Link]:

Table 3: BSc Curriculum Development Minor and Major Changes Approval

Type of Change (Major/Minor)	Department Curriculum Committee	Department Council	College Curriculum Committee	College Council	Permanent University Curriculum & Plans Committee	University Council
Major – Establish or develop a new academic program	✓	✓	✓	✓	✓	✓
Major – Change of program name	✓	✓	✓	✓	✓	✓
Major – Modify program mission and objectives	✓	✓	✓	✓	✓	✓
Major – Update program specification	✓	✓	✓	✓	✓	✓
Major – Add/Delete/Merge a specialization	✓	✓	✓	✓	✓	✓
Major – Modify program learning outcomes	✓	✓	✓	✓	✓	✓
Minor – Clarify/adjust course learning outcomes	✓	✓	✓	✓	✓	
Minor – Add/modify course	✓	✓	✓	✓	✓	

requirements or credit hours						
Minor – Change course sequence	✓	✓	✓	✓	✓	
Minor – Change topics, activities, or assessment methods	✓	✓	✓	✓	✓	
Minor – Update course specification	✓	✓	✓	✓	✓	
Minor – Add/Delete references or textbooks	✓	✓	✓	✓	✓	
Minor – Modify training or graduation project requirements	✓	✓	✓	✓	✓	

On the other hand, for the graduate studies, the major and minor changes in the curriculum and study plans can be found in the following (Link). Table 4 outlines the procedures involved in curriculum and study plan minor and major changes, for the MSc programs and the relevant committees and councils responsible for approvals at the department, college, and university levels.

Table 4: Graduate Studies Curriculum Development Approval

Procedure	Department's relevant Committees [ADQC and Curriculum and Study Plans-Committee]	Department Council	College Council	Permanent Committee For Graduate Studies Programs and Study Plans	Permanent Committee For Graduate Studies	University Council
New program	✓	✓	✓	✓	✓	✓
Add new Track	✓	✓	✓	✓	✓	✓
Pedagogy Change	✓	✓	✓	✓	✓	✓
Change the Program system [Courses and thesis / Courses and Capstone project)	✓	✓	✓	✓	✓	✓
Course Deletion	✓	✓	✓	✓	✓	
Course Addition	✓	✓	✓	✓	✓	
Update a course specification	✓	✓	✓	✓	✓	
Changing an elective course to a compulsory course or vice versa	✓	✓	✓	✓	✓	
Changing the name of the program	✓	✓	✓	✓	✓	✓
Changing the number of credit hours or more	✓	✓	✓	✓	✓	
Modification in the Sequence of courses in the study plan	✓	✓	✓	✓	✓	
Change in graduation requirements	✓	✓	✓	✓	✓	