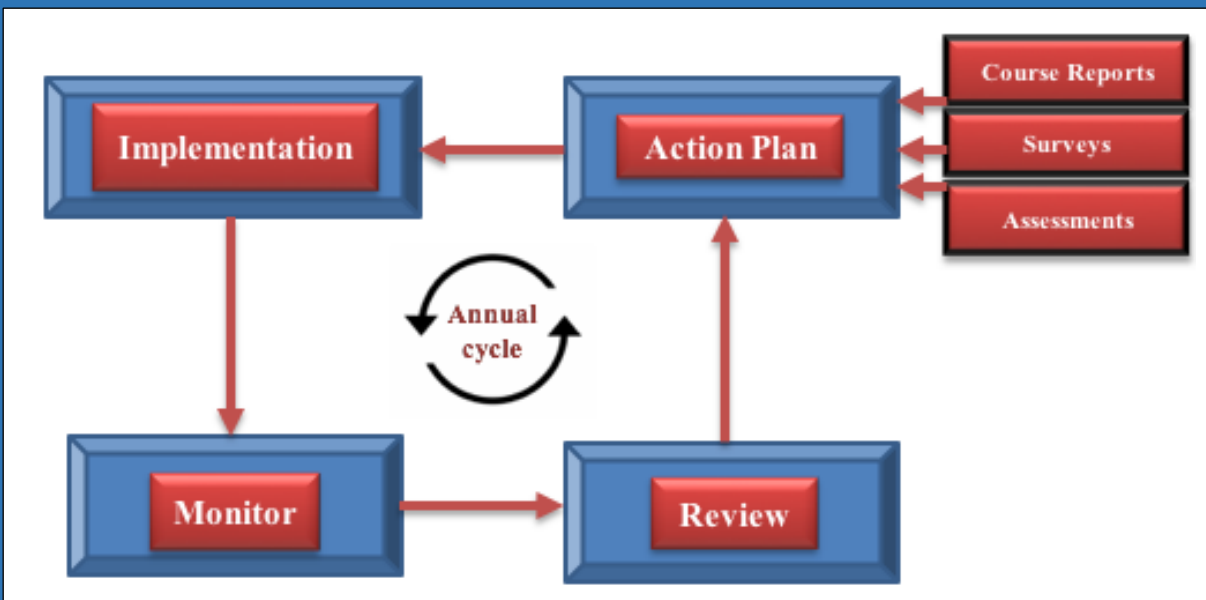


Quality Assurance Management System



Department of Mathematics

Regarding quality assurance, the Mathematics Program follows the University of Tabuk's policies and procedures available at the UT website (A detailed policies and procedures manuals are available at the university website [1](#)):

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Introduction:

The ultimate goal of the system for quality assurance is to support continuing quality improvement and hence ensure students, employers, parents and members of the community of the good international standards in all practices that takes place in the program. This document deals with standard good practices, policies and procedures followed by the Mathematics program in carrying out all its activities.

About the Mathematics program:

The Department of Mathematics was established under the decision of the Board of Higher Education on 15/37/1426 H, in order to meet the needs of the local community in the Tabuk region of qualified mathematicians. In 1431-1432 H the Mathematics Department offered a postgraduate program leading to the master's degree in mathematics. In 1435 H, the Mathematics program was accredited by the ASIIN accreditation commission.

Reasons for Establishing the Program:

In today's data-driven marketplace, mathematical skills are in high demand across the economy. Hence high-tech industry, scientific/engineering research as well as businesses and industrial organizations are always in need for those who are able to apply mathematical and computational skills to solve real-life problems and make a positive impact. Therefore mathematicians are one of the key players in executing the Kingdom 2030 mission.

The mathematics program offers its students the best opportunity to learn and develop a high level of concrete mathematical as well as computational skills, and that would allow them to participate in developing the country and the community as well.

The program mission:

The primary focus of the Mathematics Department is defined by its new statement of mission. The new mission addresses instruction, research and community service, also it explains the department's character, individuality and its harmony with the mission and vision of the University of Tabuk. The new mission of the mathematics program propagates a message that resonates with students, faculty members and all stakeholders, in such a way that reflects the uniqueness of the mathematics program and provides a constant reminder to all the stakeholders of why the program is developed.



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The Statement of Mission of the department of mathematics is as follows:

Providing mathematical and computing skills to graduates in an environment that encourages scientific research and community service.

The program goals:

- 1) Create a curriculum that promotes critical thinking, analysis, and the application of mathematical programs
- 2) Raise students' academic achievement.
- 3) Strengthening and improving faculty and staff members' abilities
- 4) Encourage participation in research programs and specialized scientific conferences.
- 5) Encourage effective community cooperation and communication.
- 6) Providing an efficient administrative and organizational environment.

The development and quality management goals:

The quality assurance management system has the following main goals:

1. Ensure good practices for quality assurance processes.
2. Ensure continuous improvement of the Mathematics Program.
3. Ensure high quality of outcomes.

The program learning outcomes:

Learning outcomes of Mathematic Program are specified clearly in the program specification using the National Qualification Framework (NQF) provides five learning domains. They are:

1. Knowledge:

- 1.1 Recall the fundamental theories and concepts of mathematical science.
- 1.2 Recognize the utilization of mathematics in other fields.

2. Cognitive Skills:

- 2.1 Analyse problems in advanced areas of mathematics using analytic and computational methods.



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- 2.2 Prove theorems using the language of mathematics
- 2.3. Apply knowledge of mathematical principles, theories and procedures in real life and scientific domains.
- 2.4. Demonstrate rigorous reasoning, critical thinking and problem solving skills.

3. Interpersonal Skills & Responsibility

- 3.1. Perform research individually and in conjunction with others.
- 3.2. Manage duty, and time with other members of the group
- 3.3. Demonstrate ability of presentation skills.

4. Communication, Information Technology, Numerical

- 4.1. Communicate mathematical ideas with clarity and coherence, both written and verbally
- 4.2. Demonstrate mathematical problems by mathematical packages.

The program graduate attributes:

- 1) Knowledge in the various branches of mathematics.
- 2) Use of scientific and analytical thinking and drawing conclusions.
- 3) Digital capability.
- 4) Constructive interaction with colleagues and faculty members of the program.
- 5) Commitment to professional values and ethics.
- 6) Responsibility towards serving the community.

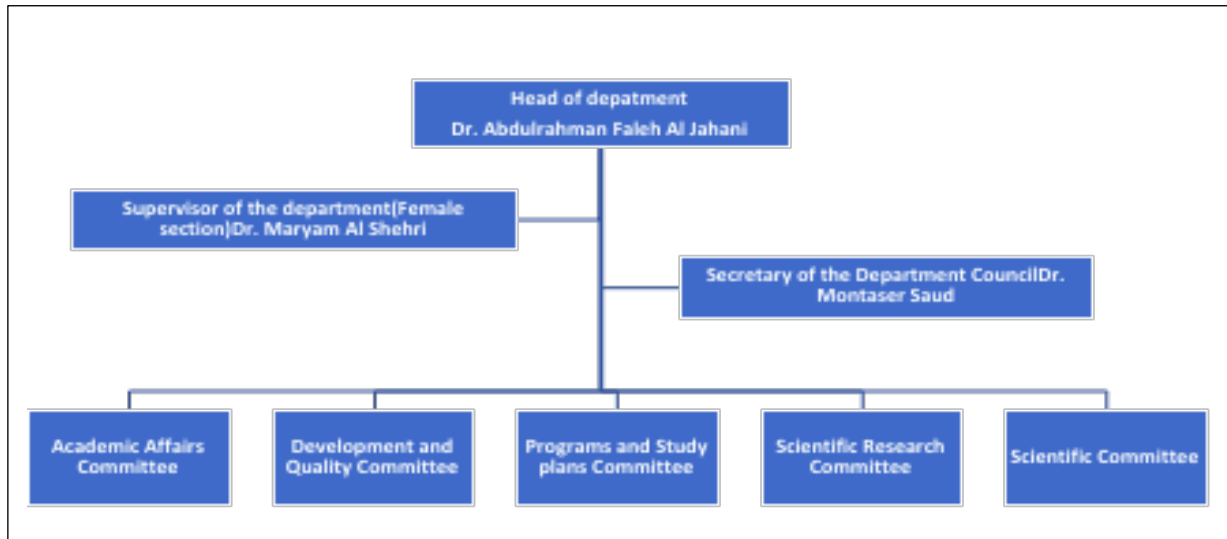
The organizational structure of the program:

The Program has a well-designed organizational structure of tracking and reporting, on its operational objectives figure 1. The HOD of the Mathematics department is advised by five Department Committees on all matters affecting the department. The HOD is responsible for initiating and maintaining policies within the program which promote and support learning, teaching, research and community outreach. Also the HOD is responsible of ensuring that the Department functions take place according to policies and regulations established by the institution, College of Science and Department of Mathematics. The HOD is accountable to the faculty council for the performance of their duties.



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Figure 1: The department organizational chart





Standards for Quality Assurance:

The Mathematica Program follows the NQF standards for quality assurance, these standards categorize all the programs activities in the following general six areas:

- 1) Mission and goals.
- 2) Program management and quality assurance.
- 3) Teaching and learning.
- 4) Students.
- 5) Teaching staff.

Under each standard the NQF has specified a number of sub-standards, that identifies the general set of good practices that must be followed by all higher education institution in the KSA. These sub-standards are presented in the following table:

The evaluation of the Mathematics Program is based on how well the Program is doing in carrying out these good practices. A self-evaluation scales form is designed by the NQF to provide guidance to the program administrators and staff planning, self-review, and quality improvement strategies. The elements used for evaluation level of the good practices followed by the Mathematics program are presented in the following table:

Table 1: Evaluation level of the good practices matrix.

Levels of Evaluation Elements of Evaluation	NA	Unsatisfactory Performance		Satisfactory Performance		
		Non-Compliance	Partial Compliance	Compliance	Perfect Compliance	Distinctive Compliance
		1	2	3	4	5
Extent of availability of elements and components of the criterion		<ul style="list-style-type: none"> There are no available elements of the criterion Or there are few available elements 	<ul style="list-style-type: none"> Most of the elements of the criterion are available 	<ul style="list-style-type: none"> All of the elements of the criterion are available 	<ul style="list-style-type: none"> All of the elements of the criterion are available 	<ul style="list-style-type: none"> All of the elements of the criterion are available
Quality level of application for each element		<ul style="list-style-type: none"> The elements of the criterion are not applied at all, (or) are 	<ul style="list-style-type: none"> The elements of the criterion are applied at low level 	<ul style="list-style-type: none"> The elements of the criterion are applied at good level 	<ul style="list-style-type: none"> The elements of the criterion are applied at perfect level 	<ul style="list-style-type: none"> The elements of the criterion are applied at distinct level

Levels of Evaluation Elements of Evaluation	NA	Unsatisfactory Performance		Satisfactory Performance		
		Non-Compliance	Partial Compliance	Compliance	Perfect Compliance	Distinctive Compliance
		1	2	3	4	5
		applied at a very low level				
Regularity of application and assessment, and availability of evidence		<ul style="list-style-type: none"> Rarely applied 	<ul style="list-style-type: none"> Applied irregularly, (or) there is no assessment, or it is there but is irregular, (or) there is insufficient evidence 	<ul style="list-style-type: none"> Applied regularly, There is a regular and effective assessment, Sufficient evidence is available 	<ul style="list-style-type: none"> Applied regularly, There is a regular and effective assessment, Sufficient and varied evidence is available 	<ul style="list-style-type: none"> Applied on a regular basis, There is a regular, effective, and excellent assessment, and Various, comprehensive, and cumulative evidence is available,
Continuous improvement and level of results in the light of indicators and benchmarking		-----	<ul style="list-style-type: none"> There may be some limited improvement procedures 	<ul style="list-style-type: none"> There are regular improvement procedures and good results. 	<ul style="list-style-type: none"> There are regular procedures for improvement and higher results compared to previous results. 	<ul style="list-style-type: none"> There are regular procedures for improvement and distinct results compared to other programs
Excellence and creativity in practices of the elements of the criterion		-----	-----	-----	-----	<ul style="list-style-type: none"> There is creativity in the practices of the elements of the criterion.



The Annual working plan for the Mathematics Program:

The main stage of the Mathematics Program life cycle are presented in the following table

Table 2: The Mathematics Program annual life cycle.

Time	Goals
Before the start of the semester	Welcome all the staff and faculty members.
	Orientation for new faculty members.
	Approval of the course reports, as well as the improvement plans.
	Approval of the program report and the operational plan.
	Appointment of course coordinators and instructors.
	Appointment of committees heads and members.
	Repreparation of the operational plan.
	The first meeting between course instructors.
First meeting between committees members.	
1st week of the semester	Orientation for students.
During the semester	The start of courses delivery and all other curricular and extracelluar activities.
	The start of plans implementation.
	Monitoring of all pogram activities.
Before the 1st, 2nd & final exams	Meeting between course instructors and coordinators.
	Decide on the outcomes to be assessed.
	Preparation and revision of exam papers.
After every exams	Analyse students' performance in all the prespecified outcomes.
	Write a report about learning outcomes assessment.
	Prepare course reports



At the end of the semester	Prepare program reports
	Prepare the operational plan report.
	Honour distinguished members in teaching, research.

The Mathematics Program carries out these stages every semester. At the end of the academic year a comprehensive program report about all the quality of performance in all aspect of the program is prepared by the program and study plan committee.

Students admitted at the Mathematics program are given orientation programs on services, facilities available and their rights and responsibilities as well as advice on curriculum matters and career opportunities . The orientation program is conducted once at the beginning of every academic year. Both the academic advisors and the senior students participate in the orientation program

In orientation program, students received a package that includes:

- ÷ The Student guide Handbook
- ÷ Contact information
- ÷ Academic counselling guide
- ÷ Executive rules for students grievance
- ÷ The rules of study and exams in UT
- ÷ The Academic Calendar.
- ÷ Location of the classrooms prior to the beginning of classes
- ÷ IT guide including how student can activate their email account and changing the password
- ÷ Welcome gifts

In addition, Students' satisfaction about the orientation program is evaluated through a questionnaire.

New faculty members are also given orientation program, where the HOD and heads of the departmental committees meet with the new academic faculty members to inform them about the rules and regulations concerning all the program activities, and they are recommended to refer to the Handbooks, specifications and forms available on the university website. Also new faculty members are nominated to attend special workshops and training programs to help them fit into the program and the institution smoothly.



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New faculty members are nominated to attend professional development training programs in different areas of academic work such as teaching strategies, methods of assessment, and research activities. Training programs, workshops and other activities are provided via different bodies at the university such as Deanship of Development, Quality and Deanship of Electronic and Distant Education and the development and quality agency of the FSUT. In addition the Vice Deanship of Quality and Development at the Faculty of Science provides workshops in teaching strategies and assessment methods. The training programs include:

- 1) Writing learning outcomes for programs and courses.
- 2) Program and course specifications
- 3) Annual course and program reports.
- 4) Learning outcomes assessment.
- 5) Scientific research skills.



How are we?

Mission and goals development polices procedures

Mission: The mission and goals of the Mathematics Program are developed to motivate the efforts of the students, faculty members and all stakeholders and provide them with a clear direction to the future state of the program. The mission and the core values of the Mathematics Program clearly provide a view of why the mathematics program exists, where it wants to be and what it stands for, and most importantly, they create a target for the operational planning of the program. As a result of starting the second strategic plan cycle the university of Tabuk has developed a new, as a response the Mathematics Program has updated its mission to be aligned with the new mission of UT as well as the new mission of the faculty of science.

To guarantee a high quality mission, and values statements, their development must be done through a collaborative process that involves students, faculty members, administrative staff and a sample of stakeholders from the local community. After their final approval by the departmental council, the mission and values are then adopted by the Mathematics Program and widely circulated among internal and external stakeholders. Figure 1, shows the main phases in the development process of the mission statements.

The standards that are followed in developing the mission statement:

- 1) Provide inspirational guidance. (the underlying rationale for its development and implementation).
- 2) Meet the needs of the internal and external stakeholders. (drive stakeholders satisfaction)
- 3) In line with the mission of the Faculty of Science and Tabuk University.
- 4) Communicate the cause, actions and the key impacts.
- 5) Appropriate, realistic and achievable.
- 6) Brief and clear.
- 7) Focused.

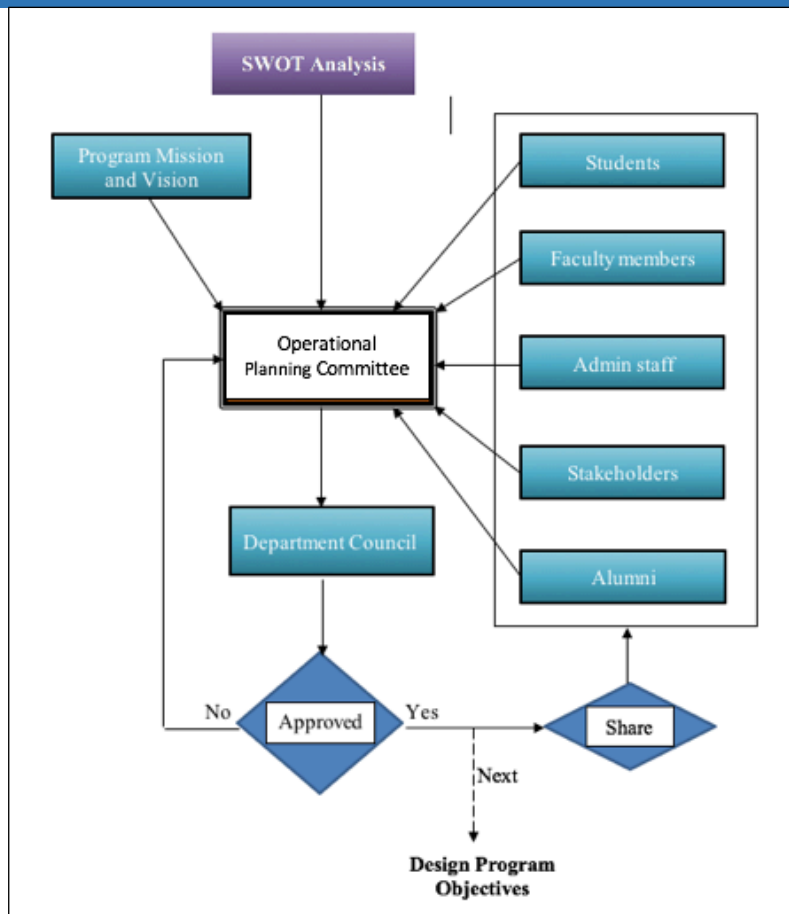
8) Reflects the uniqueness of the Mathematics Program

All these qualities are adopted in order to enhance the effectiveness of the Mathematics Program mission statement in communicating its core purpose of being. The mission statement of the Mathematics Program clearly highlights four primary areas of focus:

1. Education.
2. Research.
3. Community service.

These areas of focus establish strong foundations for the department's operational plan as well as a platform for communicating the overall vision of the university, by capturing all the important aspects of that vision.

Figure 2 Vision and Mission development Process Flowchart





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Based on the mission statement the Mathematics Program has forward-looking operational planning processes that will enable it to advance steadily toward achieving its ultimate goals. We also anticipate a future of prominence and strong influence for our department among the nation's leading institutions of higher education. It is important to recognize that the development of the mission, and goals is not a one-time activity, it is a regular, ongoing process, in order to align them with the faculty and University mission, vision and goals.

Operational goals: The mission needs to be translated into a set of clear goals for facilitating its achievement. Program operational goals are the targets that need to be achieved in order for the program to execute its mission, they also promote performance indicators by which we can gauge the success of the Mathematics program. The operational goals of the Mathematics Program define the foundation of all the educational experiences at the program. The ultimate objective of these operational goals is to graduate ethical, self-guided learner:

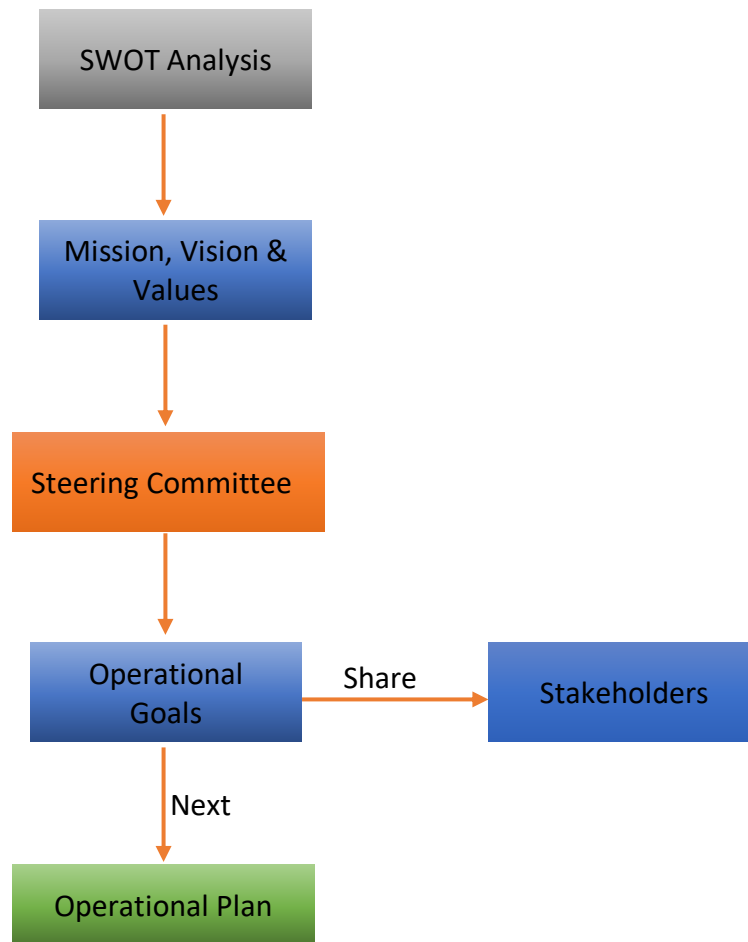
The operational goals of the Mathematics Program are distributed over five focus areas, education, academic environment, research, professional development and community services.

The standards that are followed in developing these goals:

1. Specific.
2. Measurable.
3. Appropriate.
4. Realistic.
5. Time-bounded.

All these characteristics are critical for the designing of the associated key performance indicators. The operational goals do not only create targets for the operational planning but they also provide a framework for instructional and developmental activities in all the focus areas. Figure 3 shows the development of the goals process. Faculty members are also advised to incorporate these goals in the design of the courses.

Figure 3 Developing Program Goals Process Flowchart





How we will realize our mission?

Operational Plan development polices and procedure

Operational planning requires not only a well-defined mission statement and goals but also a set of underlying core values that unite all the stakeholders in the program. These core values establish what the Mathematics Program stands for, and they provide the beliefs that guide the conduct, activities and all the goals of the program.

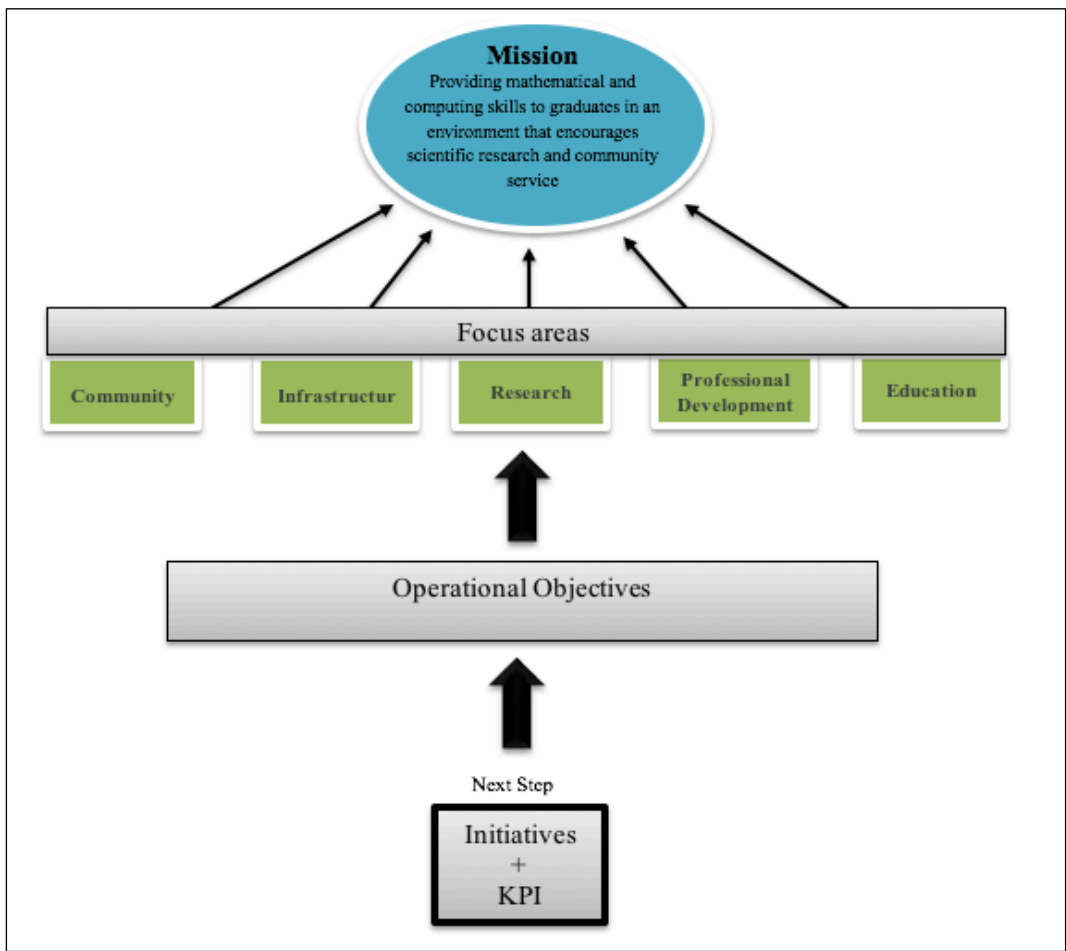
The core values that guide the Mathematics program courses, strategies and actions are:

1. **Supportive Environment:** We strive to provide and sustain a supportive and inspiring educational environment through, a well-established laboratory and library, effective guidance, mentoring, academic advisement and collaborative research.
2. **Integrity:** We are committed to move the program vision forward through our commitment to honesty in carrying out each action and continuously do what is moral, just and fair in every situation.
3. **Excellence in Education:** We adhere to provide our students with a comprehensive curriculum that promotes knowledge, cognitive skills; written and verbal communication skills; and professional and ethical conduct. We adopt a learner-centered approach to instruction that allows active student engagement and personal interactions with faculty.
4. **Excellence in Research:** We are dedicated to provide an educational environment that encourages and supports collaborative research activities with peers and with students.
5. **Professional Development:** We remain current in professional practices and dedicated to quality and continuous improvement to ensure competitive graduates, high quality research output.
6. **Community Outreach:** We enhance mathematical education in the local community, by developing appropriate educational programs.

All these values naturally emerge from the personality of the Mathematics Program, where they reflect what the internal and external stakeholders believe in. In fact the fulfilment of all these values is one of the crucial criteria in the assessment process when it comes to hiring new staff members.

In the coming sections of this report we will see how these values promote the realization of the mission of the mathematics program through a well-defined set of operational goals. Figure 4 shows how the program mission and objective fit together into the big operational picture. Every action in the program is contributing to fulfil its mission.

Figure 4 the organizational Structure underlying the operational planning





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The structure of the Mathematics Program operational plan starts by doing SWOT analysis, followed by the formation of the program mission and a vision statements, then flow into values and focus areas and operational goals, these goals are then realised in the action plan through a set of initiatives and KPIs to measure how well the program succeeded in achieving the operational goals.

The first step in creating an efficient operational plan is to specify operational focus areas that help realize the program vision statement. The focus areas of the Mathematics program are:

1. Students.
2. Faculty members.
3. Research.
4. Infrastructure.
5. Community.

These focus areas lay the foundation of the Mathematics Program operational plan. They expand the program vision statement and provide guidance to how the program will achieve its goals. These high level focus areas are what the Mathematics program is focusing on while striving to move the vision forward.

The structure elements of the Mathematics program operational model are as follows:

1. Carry out SWOT analysis.
2. Identify the Mission Statement.
3. Identify the Mission Statement.
4. Define the Values.
5. Specify the Focus Areas.
6. Create Operational Goals.
7. Set up an operational plan which includes Initiatives, KPIs, deadlines.

The excision of the operational plan is done through an annual planning process, where at the end of every academic year all the committees and course coordinators report to the department council and based on these reports action plans are set up to deal with the different matters presented before the council.



The operational plan has a clear and well-focused set of initiatives that are devised to advance the Mathematics Program in all its focus areas, serving as a roadmap for the Department of Mathematics mission. The operational plan has a five-year overlapping cycle as shown in figure4.

The operational planning committee reviews the operational plan on an annual basis. The examination of the KPIs and the benchmarks allows the Mathematics Program to assess its own performance and compare it to similar programs, helping it to identify areas of improvement.

After the setup of the highest level operational plan of the Mathematics Program, the next step is to cascade it down through all the organizational levels and stakeholders in the program. Cascading the operational plan gets all committees, teams, and individuals working together towards fulfilling the program mission and moving the highest level operational vision and goals forward in their own way.

Program KPIs

Table 3: KPIs of the Mathematics Program (The period to achieve the target (one) year)

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
1	KPI-P-01	Percentage of achieved indicators of the program operational plan goals		reports	End academic year
2	KPI-P-02	Students' Evaluation of quality of learning experience in the program		Survey	End academic year
3	KPI-P-03	Students' evaluation of the quality of the courses		survey	End of each term
4	KPI-P-04	Completion rate		report	End academic year
5	KPI-P-05	First-year students retention rate		report	End academic year

6	KPI-P-06	Students' performance in the professional and/or national examinations	General Exam	Every two years
7	KPI-P-07	Graduates' employability and enrolment in postgraduate programs	Survey	End academic year
8	KPI-P-08	Average number of students in the class	report	Beginning of each term
9	KPI-P-09	Employers' evaluation of the program graduates proficiency	survey	End academic year
10	KPI-P-10	Students' satisfaction with the offered services	survey	End academic year
11	KPI-P-11	Ratio of students to teaching staff	report	End academic year
12	KPI-P-12	Percentage of teaching staff distribution	report	End academic year
13	KPI-P-13	Proportion of teaching staff leaving the program	report	End academic year
14	KPI-P-14	Percentage of publications of faculty members	report	End academic year



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15	KPI-P-15	Rate of published research per faculty member		report	End academic year
16	KPI-P-16	Citations rate in refereed journals per faculty member		report	End academic year
17	KPI-P-17	Satisfaction of beneficiaries with the learning resources		survey	End academic year



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Development and modification of the curriculum polices and procedures

([The UT policies and procedure guide](#))

The Bachelor of Mathematics requires the successful completion of 130 credit hours distributed across the courses provided by the program as well as the capstone project in the final year. The distribution of 130 credit units required for the B.Sc. degree in the Mathematics Program.

Rationale: The curriculum generally details the teaching, learning and examination materials for all the courses in the program. The curriculum of the Mathematics Program is planned and developed according to the needs of the students, the local community and the professional bodies. The curriculum model structure is shown in figure 5.

The Mathematics Program curriculum development process goes through the four major phases:

Phase 1: Planning

During this curriculum development phase the program and study plans committee has done research collected and analysed data regarding:

1. Issues and trends of mathematics education at the local area and nationwide. Identifying key issues and trends allows the program and study plans committee to design an appropriate Curriculum that is responsive to the needs of the students, the local community and the professional bodies and assess.
2. Resources that can be provided to implement the curriculum.
3. Policies and guidelines from the Faculty, University and national education and accreditation bodies.

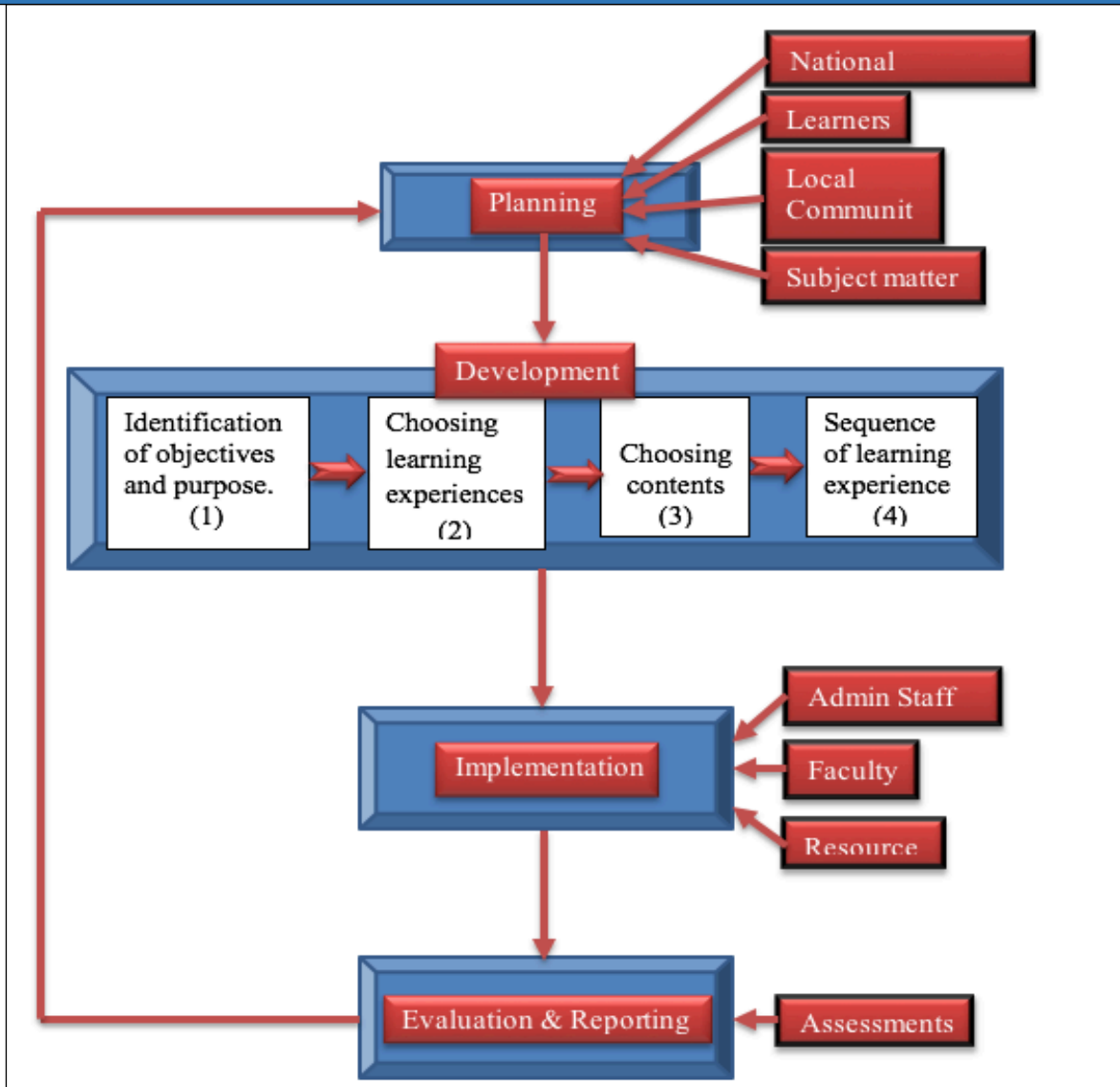
The data sources include exam papers, assignments, lecture notes, text books, surveys of students, faculty members, professional bodies and local community, surveys of students, faculty members, local community and local. The work done on this phase will inform the curriculum development.

Phase 2: Developing

During this curriculum development phase the program and study plans committee has reviewed decided on the following:

1. **Learning Outcomes:** Identify what appropriate learning outcomes students must acquire by the end of the program.
2. **Contents:** Refer to instructional materials and resources needed to facilitate an effective learning experience.

Figure 5 The curriculum development model





3. **Learning experience:** Refer to all the activities devised for learners to reinforce learning.
4. **Sequence of learning experience:** How the learning experiences should be organised to ensure effectiveness of instructions.

Courses made by the program and study plans committee about curriculum goals and outcomes are motivated by the following factors.

1. The Subject matter.
2. The National Standard Policies on education.
3. The needs of the learners.
4. Local Community.

Phase 3: Implementation

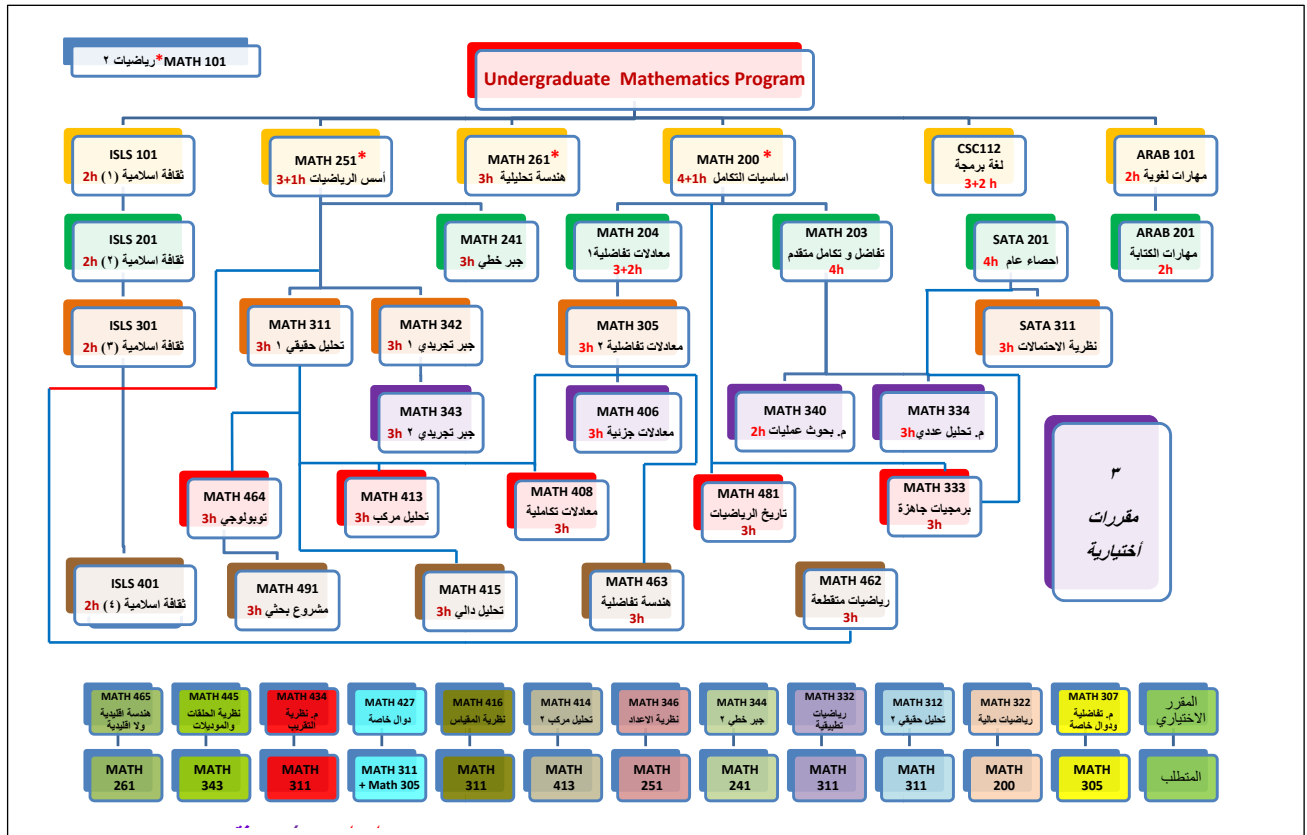
After a new curriculum has been approved to commence it must be executed in no more than 12 months. Otherwise the approval will lapse.

Phase 4: Evaluation and Reporting

During this curriculum development phase the program and study plans committee has discussed and made courses about the appropriateness of the following elements:

- 1) **The curriculum Flow Chart:** The mathematics department offers a wide range of courses in pure and applied mathematics for its majors and for students in other disciplines. The Program prerequisite flowchart has been designed to assist students and faculty advisors in planning and map out their path towards graduation see figure 5.
- 2) **Outcomes Assessment:** What kinds of tasks will reveal the effectiveness of the learning experience and the extent to which the educational outcomes being realized?

Figure 5: The curriculum flowchart





The Mathematics Program cyclical Review Policies and Procedures

Rationale: The annual program review is one of the mechanisms adopted by the Mathematics program to ensure that the program is on continual quality progress in order to meet the highest standards of academic excellence.

Every 5 years the Mathematics Program conducts a comprehensive program review and deliberation, which might leads to major or minor program modifications. Table 4 shows the main evaluation focus areas and standards.

Table4: Areas of the program core evaluations and the associated goals

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
KPIs	All stakeholders	Surveys, interviews, Assessments	End of every term
learning resources	students, graduates, faculty	Surveys, interviews	End of every term
Program evaluation	students, graduates, faculty	Surveys, interviews	End of every year
Alumni satisfaction	Surveys	Surveys	End of every year
Employers satisfaction	employers	Surveys	End of every year
awareness of the mission statement and objectives	All stakeholders	Surveys, interviews	Every 5 years
A comprehensive Program review	independent reviewers	Reports, interviews, visits	Every 5 years
Research productivity	faculty	Surveys, interviews	End of every year
Effectiveness of community partnerships	Faculty, community leaders	Surveys, interviews	End of every year

The approval and implementation of any modifications is conducted using the university templates, forms, policies, procedures as well as the authority matrix for approval of modifications.

Annual review: The University Curriculum Committee is responsible for ensuring that annual review of all academic programs are in place. Annual Program review starts by collecting data from using the standard university templates and forms of course reports, students, graduates,



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faculty members and admin staff surveys as well as professional bodies surveys. Data analysis, action plans and performance indicators are documented in the annual program report university of Tabuk's template. The HOD sends the program report towards the end of the academic year to the faculty quality assurance unit which is responsible for ensuring that the report is well written and meets all quality standards recommended by the University of Tabuk and the NCAAA. The Mathematics program is responsible for preparing the annual review report and of implementing the proposed action plans for quality improvements. The whole review process is presented in figure 6 and in figure 7 the review and approval flowchart is presented.

Core review: Core review of the Mathematics Program is carried out every 5 years in alignment with the faculty of science and the UT strategic plan development. The core review major steps are as follows

Step 1: The HOD initiate the review commissioning processes and elect internal and external reviewers.

Step 2: The goals of the review are clearly identified.

Step 3: All internal and external stakeholders are informed of the review initiative.

Step 4: SWOT Analysis is done with participation of internal stakeholders and representatives of the professions.

Step 5: Self-study report is prepared using the standard memo templates provided by the University.

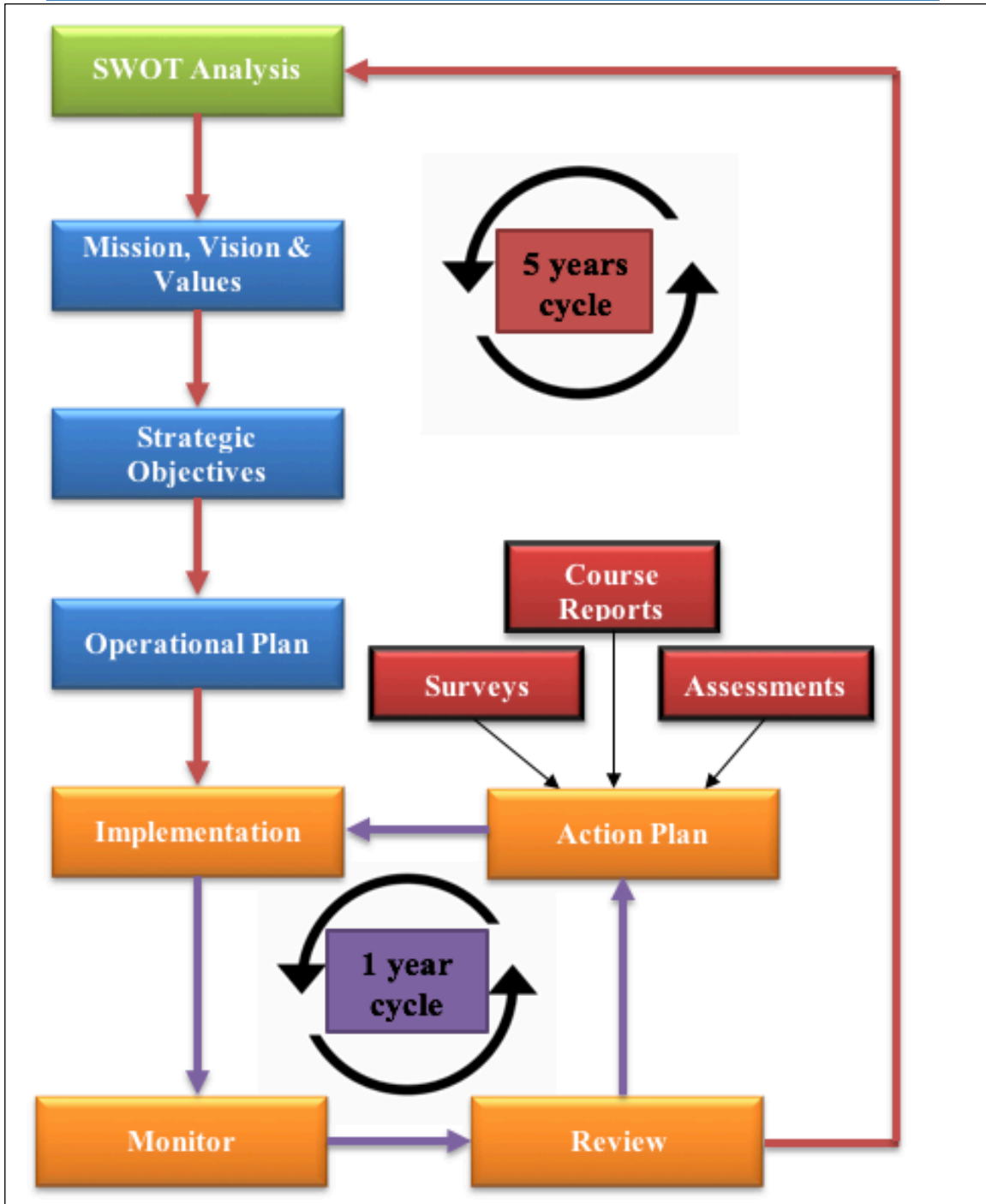
Step 7: The reviewers site visit.

Step 9: The HOD formally accepts the review after ensuring that all the issues raised are clear and factual error are corrected.

Step 10: The review report is publicized to all faculty members.

Step 10: An operational plan is prepared, the plan includes, initiatives that realize the goals, deadlines for execution, key quality indicators to measure the progress, and bench mark.

Figure 6 the Mathematics Program cyclic review flowchart



Step 6: The Self-study, SWOT analysis reports and all relevant data are submitted to the internal and the external reviewers. The site visit schedule is prepared and circulated to all relevant stakeholders.

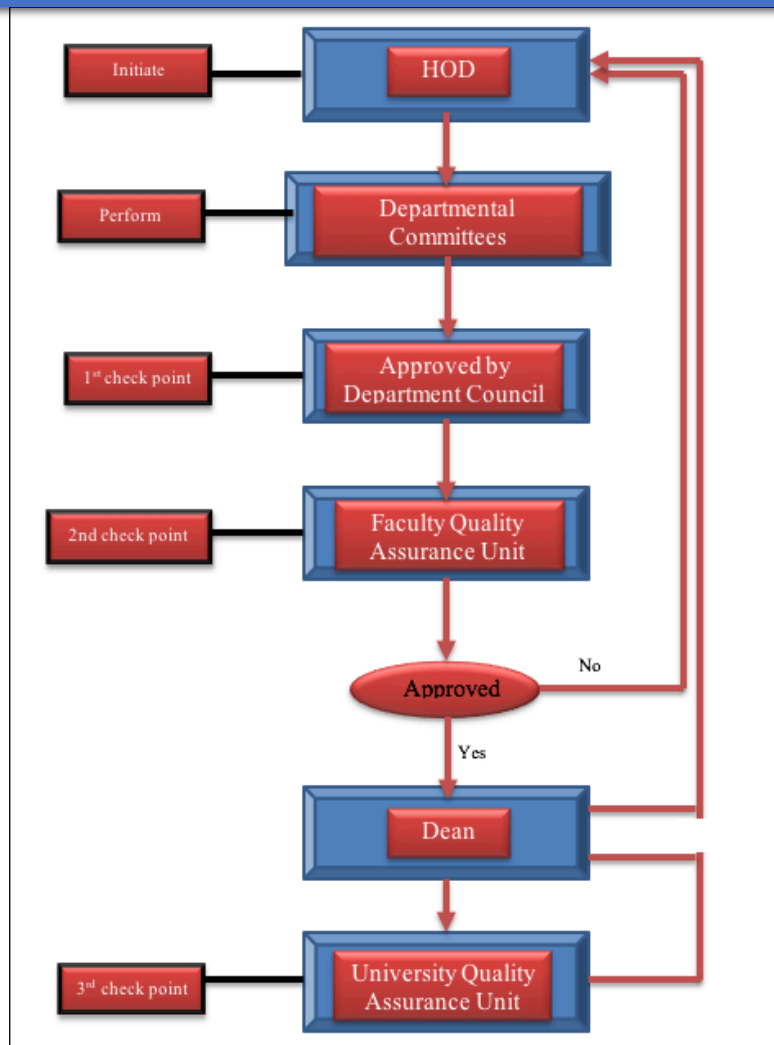
Step 11: Approval of the operational plan by the department council.

Step 12: Approval of the operational plan by the dean.

Step 13: The Dean send the operational plan to the UT.

Step 15: Implementation of the operational plan and monitoring of the progress by the Mathematics department, the faculty quality assurance unit and the UT.

Figure 7: Program review and approval Flowchart





New programs proposals: Proposals for new programs must first demonstrate and justify strong rationale behind the need of the program through consultation with expert advisors, colleagues and the administration, the proposed programs must. proposals must be submitted to the department program and study plans committee, department faculty, and the HOD using the Program specification template provided by the University Curriculum Committee. The approval of the new program proposal follows the same procedure of the new course proposals. To assist in developing high quality program proposals the Mathematics Program has setup the following series of instructions:

1. The proposal must demonstrate a clear mission vision and underlying values together with set of overarching goals that guide the entire program and the decisions that affect each aspect of the program. The mission and values must be appropriately aligned with the mission and vales of the University.
2. In pursuing the program goals to fulfil its mission the curricula at all levels must realize the competences specified by the University and the national higher education and accreditation bodies such as NCAAA; NQF and as well as the competences needed by the relevant professional bodies and in both the private and public sector.
 1. Suggest a framework for all the learning experiences; activities devised for learners to reinforce learning.
 2. Specify methods of assessing the achievement of the program's goals.
 3. provides a reporting and review system to ensure continual improvement.

Major Program Modification: Major change includes, Significant changes to admission or program requirements, Significant changes to courses and curriculum, Changes to admission requirements, learning outcomes and/or delivery mode. Proposals for major program changes should clearly justify the rationale behind any proposed modification. All major modifications require a recommendation for approval by the University Curriculum Committee. To ensure alignment with the university and the NQF polices the department program and study plans committee uses the templates, documents, instructions, and guidelines regarding programs modifications which are available on the University Curricula Committee website.

Minor Program Modifications: Minor modification are essential for continual improvement. Minor modifications include, name changes, Contact and address, exam procedures and timing. Minor modifications are managed by the HOD in conjunction with the program and study plans



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committee. Once a minor modification has been approved it will be publicized via the department website to all stakeholders.

Program Closure: To make an informative decision about a program closure data about assessing program demand, financial impacts, trends of students enrollment, industry trends and student outcomes should be collected and analyzed. Reasons for closing a program includes:

1. Low enrolment
2. Lack of faculty resources
3. Changing higher education landscape
4. Make room for new opportunities
5. Shifting students' interests
6. Changing external contexts

Proposals for program closure should be clearly articulate the reasons for closing the program using the memo template provided by the University Curriculum Committee, also timeline plan for action must be in place to take care of all the expected consequences and guarantee a well synchronization with the university system. The University Curriculum Committee is the final approval agency for any program closure.



Assessments Policies and Procedures

The aim of assessment is to firstly ensure that the Program is meeting its goals in terms of teaching and learning and, secondly, to improve the quality of future teaching and learning, where throughout the delivery of the course material, faculty members not only communicate the information they planned but also continuously assess students learning in order to foster student learning more effectively.

Regarding assessment strategies the Mathematics Program embody the perspective that the primary goals of assessment are:

- 1. Making instructional decisions:** Teachers gather assessment data continuously in order to ascertain how effective their teaching has been and to make changes in what and how they teach.
- 2. Monitoring students' progress:** Utilizing different assessment strategies allows teachers to analyse what their students have learned, and also provide multiple indicators of the areas of understanding and misunderstanding of every student
- 3. Evaluating the Programs:** The effectiveness of the program is evaluated using a Variety of assessment tools which includes students' performance in the different courses.

To realize this perspective the Mathematics Program utilizes multiple assessments not only at the end of the course but during the learning process itself. Thus at the Mathematics Program the assessment of students learning outcomes is a continuous process that involves a variety of assessment strategies, to address weaknesses and misunderstandings after the assessment, faculty members are advised to identify areas of understanding and misunderstanding and write action plans in the course report.

Learning assessment: Learning is assessed through what students can do with their learning. At the Mathematics Program, learning is assessed through the following direct as well as indirect assessment methods, as shown in Table 3.

Table 3: Direct and indirect assessments.

Direct methods	Indirect methods
Classroom Observation: Classroom discussion allows faculty members to gain	Student survey to explore the opinions of the students currently enrolled in the program.



information about students level of interest and understanding of the material.	
Student Presentations	Course evaluation to explore the opinions of the academic staff.
Graduation Projects	Students' graduation rates / grades.
Course Portfolio (Student's achievement file), Quizzes, Midterm exams, Final Exam	Program evaluation to explore the opinions of the graduates.

Direct assessment: Direct assessment includes tests, examinations Course Portfolio etc. The examinations approaches, is used by most faculty members at Department of mathematics in association with cognitive learning outcomes in order to assess students achievement with regard to a general body of critical thinking, problem solving and knowledge associated with the specific courses. While, in portfolio evaluation, includes home works, quizzes, essays etc.

Indirect assessments: Indirect assessment gives students an opportunity to reflect on their learning experiences, and is usually done through multiple surveys which includes (course evaluation survey, program evaluation survey, student experience survey). Students at the Mathematics Program evaluate their instructors and courses electronically through the University's' Sahel system for all taught courses every semester.

All the assessment outcomes are discussed in detail in the following report:

1. Annual Program Report: Which is prepared by the program and study plans Committee at the end of each academic year. The annual program report is an aggregate report that contains, data, KPI's common issues across all the course reports as well as action plans for improvements ref.
2. Course report: Which is prepared by the faculty members at the end of each course. The report present students direct and indirect assessment results, analysis issues related to the learning, teaching and assessment processes, suggestion and action plans for improvements. The course report is a part of the course file, the contains of the course file includes samples of students work as well ref.



Learning Outcomes Assessment

Learning outcomes of Mathematic Program are specified clearly in the program specification using the National Qualification Framework (NQF) provides five learning domains. In the program specifications, the learning outcomes are linked with suitable teaching strategies that fit and align with the assessment methods. In addition, the learning outcomes of Mathematics Program are also linked with the program courses that are required to achieve these learning outcomes with different levels as Introduction, Proficient and Advanced. Please refer to the program specifications for the Program Learning Outcomes Mapping Matrix.

Learning outcomes are indicators of success of an academic program. Where they give a clear idea of what can be achieved by joining the Mathematics Program. Assessment of Mathematics Program learning outcomes is an important factor which guarantees quality in the teaching-learning process, because it allows to establish whether or not goals have been reached and what is the overall learning pace.

Matching of Mathematic Program learning outcomes with courses learning outcomes:

In order to measure the Mathematics Program learning outcomes, the program learning outcomes were matched with the course's learning outcomes through the following matrix, which presented in the program specification.

Courses/Learning domains	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
	0	0	0	0	0	4	5	6	0	0	1	1	2	3	3	3	3
	0	1	0	3	4	1	1	1	5	7	1	2	2	2	3	3	4
Knowledge																	
1.1	I	I	P	P	I	I	I	I	P	P	P	A	P	P	P	P	I
1.2			I	I	I	I	I	I	P	P		P	A	A	P	P	P
Cognitive																	
2.1	I	I	I	I	P	P	P	I	P	P	P	A	P	P	P	P	P
2.2		I	I	I		I	I	I	I	I	P	A					P
2.3					I				P	I			A	A	P	P	P
2.4	I	I	I	I	I	I	P	I	P	P	P	P	P	P	P		P
Interpersonal skills and responsibility																	
3.1	I	I	I	I	I	I	I	I	P	P	P	P	P	P	P	P	P
3.2			I		I			I									
3.3																I	
Communication, information technology ; Numerical																	
4.1	I	I	I	I	I	I	I	I	I	P	P	P	P	P			P
4.2																P	P



Course s/Learning domains	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	0	0	1	1	1	1	2	3	4	6	6	6	6	8	9
	0	2	3	4	6	6	8	3	4	5	6	7	4	5	2	3	4	5	1	1
Knowledge																				
1.1	I	P	A	A	A	P	A	A	A	A	A	A	A	A	A	A	A	A	P	A
1.2	P			A	P	P	P		P				P		P				P	A
Cognitive																				
2.1	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
2.2		P	A	A	A	P	P	P	A	A	A	A	A	A	A	A	A	A	P	A
2.3	P								P				P		P				P	A
2.4	I	P	A	A	P	A	A	A	A	A	A	A	A	A	A	A	A	A	P	A
Interpersonal skills and responsibility																				
3.1	I	I	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
3.2																				A
3.3						P													P	A
Communication, information technology ;Numerical																				
4.1	I	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
4.2	P																			A

Method of measuring Mathematics Program learning outcomes: The learning outcomes of courses will be measured by the courses' coordinators using the methods specified in course specifications. The following formula will be used for measuring learning outcomes:

$$\text{Score of learning outcomes} = \frac{(A \times 5) + (B \times 4) + (C \times 3) + (D \times 2) + (F \times 1)}{A + B + C + D + F}$$

Where;

A = Number of students who achieved 90.0% - 100.0% of Marks in the learning outcome.

B = Number of students who achieved 80.0% - 89.9% of Marks in the learning outcome.

C = Number of students who achieved 70.0% - 79.9% of Marks in the learning outcome.

D = Number of students who achieved 60.0% - 69.9% of Marks in the learning outcome.

F = Number of students who achieved less than 60.0% of Marks in the learning outcome.

The value of measurement of the program learning outcomes will be calculated as the average of all values of measured courses learning outcomes that are linked to that program learning outcome according to the above table.



Schedule of measuring Mathematics Program learning outcomes:

The methods and schedule for measuring Mathematics Program learning outcomes are summarized in the following table.

In the academic year

According to the plan of measuring Mathematics Program learning outcomes, the following learning outcomes were measured in the academic year

Code#	Mathematic Program learning outcomes	Linked course outcomes		Value of measure
		Course name	Learning outcomes	
1.2	Recognize the utilization of mathematics in other fields			
		Average		
2.2	Prove theorems using the language of mathematics			
		Average		
2.4	Demonstrate rigorous reasoning, critical thinking and problem solving skills.			
		Average		
3.2	Manage duty, and time with other members of the group			
		Average		
4.1	Communicate mathematical ideas with clarity and coherence, both written and verbally			
		Average		



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In the academic year

According to the plan of measuring Mathematics Program learning outcomes, the following learning outcomes were measured in the academic year

Final results of first cycle of measuring learning outcomes of Mathematic Program:

Code	Mathematic Program learning outcomes	Result
1.0	Knowledge	
1.1	Recall the fundamental theories and concepts of mathematical science.	
1.2	Recognize the utilization of mathematics in other fields	
2.0	Cognitive skills	
2.1	Analyse problems in advanced areas of mathematics using analytic and computational methods.	
2.2	Prove theorems using the language of mathematics	
2.3	Apply knowledge of mathematical principles, theories and procedures in real life and scientific domains.	
2.4	Demonstrate rigorous reasoning, critical thinking and problem solving skills.	
3.0	Interpersonal skills & responsibility	
3.1	Perform research individually and in conjunction with others.	
3.2	Manage duty, and time with other members of the group	
3.3	Demonstrate ability of presentation skills	
4.0	Communication, information technology, numerical	
4.1	Communicate mathematical ideas with clarity and coherence, both written and verbally	
4.2	Demonstrate mathematical problems by mathematical packages	
5.0	Psychomotor	



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Improvement plan of Mathematic learning outcomes

	Mathematic Program learning outcomes	Actual KPI	Target KPI	Internal KPI	New target KPI
1.0	Knowledge				
1.1	Recall the fundamental theories and concepts of mathematical science				
1.2	Recognize the utilization of mathematics in other fields				
2.0	Cognitive skills				
2.1	Analyse problems in advanced areas of mathematics using analytic and computational methods.				
2.2	Prove theorems using the language of mathematics				
2.3	Apply knowledge of mathematical principles, theories and procedures in real life and scientific domains.				
2.4	Demonstrate rigorous reasoning, critical thinking and problem solving skills.				
3.0	Interpersonal skills & responsibility				
3.1	Perform research individually and in conjunction with others.				
3.2	Manage duty, and time with other members of the group				
3.3	Demonstrate ability of presentation skills				
4.0	Communication, information technology, numerical				
4.1	Communicate mathematical ideas with clarity and coherence, both written and verbally				
4.2	Demonstrate mathematical problems by mathematical packages				



The courses are assessed within the framework of the University’s regulations, (students must attain 60 % in mid-term exams and other activities and 40% in the final exam). Students must be required to achieve a minimum Grade Point Average (GPA) of 2.0 at each level in each course (out of a possible 5.0); if they fail to achieve this level, they do not pass and must retake the course. The GPA is determined by dividing the total number of points from all the courses the student has attended by the number of units in the student’s schedule. Further to evaluate students’ learning and experiences, the Department gather data by conducting a course evaluation survey, graduates surveys and a student experience survey. A student's GPA is determined by dividing the cumulative point value of all courses attempted by the number of units in the student's semester schedule. The cumulative grade point average is translated in Tables 5; 6 below:

Table 5: Cumulative Grade Point Average

Grade	GPA
Excellent	> 4.50
Very Good	3.75-4.50
Good	2.75-3.75
Pass	2.00-2.75
Fail	<2.00

Table 6: Grading System

Average Point	Numerical	Grade
5.0	95-100	A+
4.75	90-less than 95	A
4.5	85-less than 90	B+
4.0	80-less than 85	B
3.5	75-less than 80	C+
3.0	70-less than 75	C
2.5	65-less than 70	D+
2.0	60-less than 65	D
1.0	Below 60	F



Learning Resources Assessment

The Mathematics Program provides a well-ventilated classrooms equipped with all required facilities. Moreover the computer lab has efficient computers connected with the internet. Besides academic activities, there are non-academic activities (cultural and sports). Along with special considerations made for people with disabilities.

Moreover, Tabuk university's deanship of student affairs offers smartphones and laptops to students on a monthly payment plan, since smartphones and laptops come with useful apps like BlackBoards, CamScanner, Microsoft programs and university of Tabuk (My service)

Also in cooperation with the General Administration of Maintenance and Operations at UT, which is supervised by the Vice-President, the Faculty of Science established a Learning Resources Committee consisting of faculty members and employees from both males and females sections to oversee and facilitate the teaching and learning process. The learning resources committee has the following responsibilities:

- ≠ Regular assessments at the beginning of each semester for all learning resources and services in both sections which include:
- ≠ Classrooms and their facilities as light, smartboards, and adequate seats
- ≠ Electronic resources such as Blackboard, Up-To-Date and other electronic resources that are used by staff members and students.
- ≠ Labs and its equipment.
- ≠ Computer labs.
- ≠ Non-academic services provided to support student learning (such as religious, sports, and dining facilities) used by staff members and students.
- ≠ Offices of the faculty staff members and its facilities.
- ≠ Collect the data relevant to the learning resources and facilities obtained from the student's experience surveys and Program evaluation surveys to execute action plans for improvement.
- ≠ Contact the scientific departments to inquire about any learning resources requirements.
- ≠ Write a report about the adequacy of the resources compared with the number of students and staff members and the problems if any.



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The learning resources committee submitted reports to the Vice-dean to contact the higher administration to solve these problems as soon as possible according to UT regulations. In alignment with the faculty efforts, the Vice President starts to contact the faculties before the end of the semester to set a deadline for the faculties to submit the learning resources requirements. Staff members are strongly committed to provide students with the necessary requirements and resources for teaching and learning before starting each semester. The needed learning resources for each course are submitted to the head/supervisor of the department who collect the requirements of all courses in the department and raise a request to the Learning Resources Committee

Another way to evaluate the adequacy of and appropriateness of learning resources and services provided to support student learning is through the evaluation of student's surveys. Such as student experience survey, program evaluation survey.



Teaching Assessment policies and procedures

The crucial criteria for quality assurance of teaching and learning is the extent to which students are challenged and engaged in learning, and are learning at the right level.

Faculty development activities are designed on the basis of the priorities of the University system, the future strategic plan, and the specific needs of the faculty members. For the last two years, the activities of the Faculty Development Plan, were in the focus areas of:

- 1) Technical and professional skills of the faculty members and other staff.
- 2) Academic teaching and research skills.
- 3) Leadership and administrative skills of all staff.
- 4) Critical and creative thinking skills.

In order to ensure the quality of learning and teaching, new faculty members involved in learning and teaching methods should attend initial professional development programs, which ensure that they are appropriately prepared for their defined roles in learning and teaching and research degree supervision, and can demonstrate that they have met the relevant level (as determined by the nature and extent of the learning and teaching responsibilities).

Another initiative in supporting quality of teaching at University of Tabuk is the establishment of the Deanship of E-learning and Distance Education. University of Tabuk views e-learning as a promising vehicle to achieve learning goals effectively.

Thus, it established the Deanship of E-learning and Distance Education which aims at:

- 1) Supporting the development of University courses in electronic form.
- 2) Providing faculty members with advice and technical support for the development of educational sites.
- 3) Stimulating electronic communication between faculty members and students.
- 4) Developing faculty member skills to enable them to convert their courses into e-courses.
- 5) Training faculty members to carry out their tasks related to students' evaluation..
- 6) Promoting the culture of e-learning at University of Tabuk



Effective teaching as well as research is highly valued within university. The University recognizes outstanding teaching and research through award. In addition, at the beginning of each academic year, the top ranking teachers based on students evaluations and the top ranking researchers based on ISI publications receive an appreciation letter and certificate from the Dean.

Teaching Strategies: Faculty members at all sites are required to follow course specifications which are available at the department website, the curriculum alignment committee is responsible to ensure that the same curriculum is being delivered at all sites. All the outlines of teaching and assessment strategies set out in the program and course specifications must be followed by teaching faculty members.

The teaching and learning focuses on the needs, abilities, interests and learning styles of the students. The design of curriculum and courses' contents are in support to serve this situation. The teaching methods includes:

- 1) Group work: which allows students to be engaged in the learning process at a high level. where they learn how to solve more complex mathematical problems than they could do on their own. They also get the opportunity to value group work and be open to different perspectives.
- 2) Case study: Many students learn better from examples, therefore presenting ideas and concepts through clear examples can therefore be a very effective technique.
- 3) Free discussion: During this interactive activity students talk with each other about some mathematical problem or concept, and exchange ideas. The Lecturer's main role is to encourage students to participate in the discussions and facilitate the whole process.
- 4) Brain streaming: strategy enhances and helps students to develop higher critical thinking skills.

Each course learning outcome needs special methods for teaching and learning as well as special methods for assessment according to the nature of the learning outcomes. In addition, as the learning outcomes of courses are derived from those of the program, therefore, teaching and learning strategies are varied according to the nature of the course and according to the learning outcomes of the program. As stated in the course's specifications, the intended learning outcomes of the course determine the type of course and the required strategies for teaching, learning and assessment. Courses of lower levels such as Math 100 and Math 101 depend mainly on classic



class lectures and exams with different types of questions, while for courses of higher levels different strategies are used, problem based learning and discussion of applied problems.

Faculty members are expected to develop plans regarding how they will conduct their teaching in order to attain course outcomes. Course plans are prepared on the MISBAR platform, which is accessible by all students registering in the course. Instructors are required to upload all the following information about the course on the MISBAR platform:

- 1) Basic information of the course.
- 2) Instructor information.
- 3) Lecture and lab timetables.
- 4) Course description.
- 5) Course objectives and teaching strategies.
- 6) Course delivery schedule during the academic semester.
- 7) Assessment and evaluation plan and schedule.
- 8) References and further reading materials.
- 9) The instructor's policy of dealing with students within the framework of the university laws, regulations and guidelines.

Students should be encouraged by instructors to refer to this platform to acquire a comprehensive understanding of the course, contents, delivery and assessment processes.

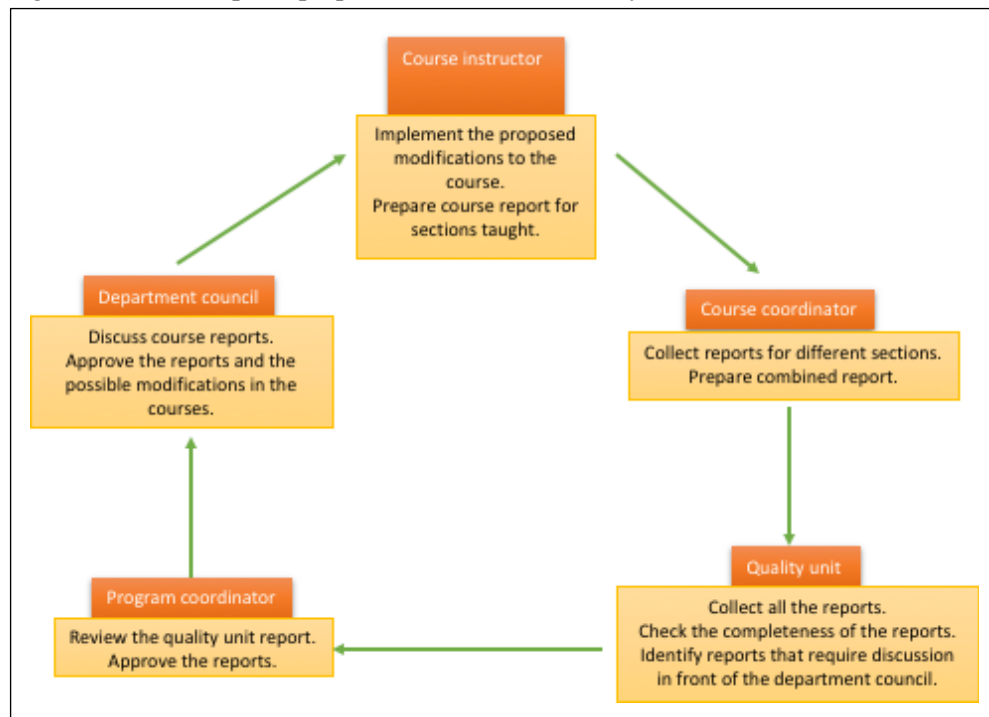
The mathematics program has developed a blueprint specification table 1.1 for preparation of exams, this table is used by all faculty members for exams construction. The specification table figure 3-3-6 is a two-way chart that defines the test content, and links subject matter content to behavioural educational learning outcomes. It shows the relative weight of each educational content topic, and the relative weights of the behavioural learning outcomes at their different levels in Bloom's taxonomy. The purpose of the specification table is to:

- 1) Assure that a representative sample of course contents and course learning outcomes is assessed.
- 2) Grades are distributed fairly over course contents and learning outcomes.
- 3) Allow Faculty members to construct questions that focus on key area

Topics Weight	Marks	Question	Learning Domains				Q & M	# Topics	Topics
			Communication	Interpersonal	Cognitive	Knowledge			
			0	0	12	8			
30%	7,5	3,0	0	0	2	1	Question	6	Chapter 1
			0	0	5	3	Mark		
30%	7,5	3,0	0	0	2	1	Question	6	Chapter 2
			0	0	5	3	Mark		
40%	10,0	4,0	0	0	2	2	Question	8	Chapter 3
			0	0	6	4	Mark		
		10	0	0	6	4	# Q		
	25		0	0	15	10	# M		
100%			0%	0%	60%	40%	Domains Weight		

The evaluation of the teaching strategies and assessment methods are documented in the course reports.

Figure 8: Course reports preparation and utilization cycle.





The course report provides a summary of all the practices before, during and after the delivery of the course, as well as feedback, recommendations and action plans for improvement. By the end of every term course instructors are obligated to prepare a course report using the NCAAA course report form. The reports are then collected by the quality assurance unit at the department which check their completeness and identifies the reports that need to be discussed at the departmental council. Finally the reports are presented in front of the departmental council for approval and discussion of possible changes in course contents, references or teaching strategies, etc. Based on the type of the proposed modifications approval from the faculty council or the university curriculum unit might be required. Course coordinators are responsible of following up with all the course instructors to make sure that all the proposed changes and action plans are implemented during the subsequent term

At the beginning of each course, it is mandatory for the course instructor to provide students with an elaborative explanation to the course inauguration with detailed rationale, significance and relevance of the course, the learning outcomes as well as the methods of assessment. Feedback from students is used to monitor the commitments of the teaching staff to these regulations. Students course evaluation survey is divided into three main sections: The first one is about the start of the course, the second one is about the delivery process and the third one is about the course assessment process. The students' performance and recommendations for further improvements are discussed and approved by the department council.

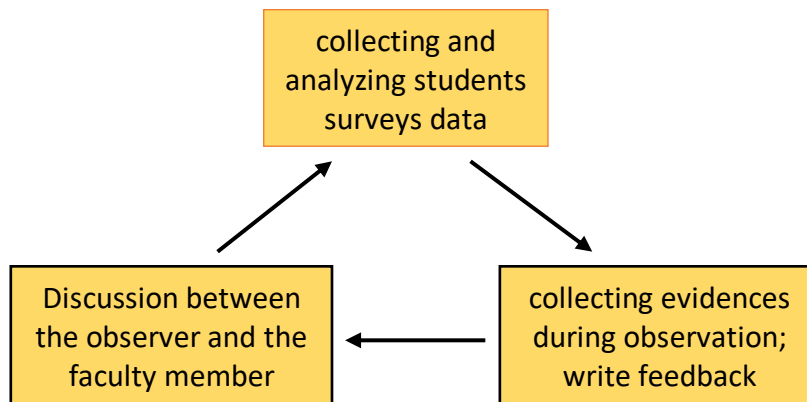
Faculty Member Evaluation survey: Beside giving students an opportunity to reflect on their own learning, the Mathematics program also gives them an opportunity to evaluate the quality of teaching, the focus area of assessment are stated in the survey are:

- 1) Questions about the start of the course.
- 2) Questions about what happens during the course.
- 3) Questions about evaluation of the course.
- 4) Open ended questions.

Peer to peer observations: The purpose of peer review is to provide a constructive and supportive feedback that works alongside other forms of professional development. Peer review is an entirely voluntary process at the Department of Mathematics and it reflects commitment of the department and the faculty members to professional development. Peer observation starts by collecting and analyzing data from students surveys, this step is done by the Department Program and study plans

committee, the next step is to identify focus for observations. The volunteer observer is then requested to attend a lesson and collect needed evidences for the focus areas and feedback discussion afterwards figure 9.

Figure 9: Peer review cycle.



Finally the peer observes the faculty's lectures and reports on strengths and needed improvements to the faculty and the department.