Program Specification

(Postgraduate Programs)

Program Name:	**M.Sc. in Mathematics**
Program Code (per the Saudi Standard Classification of Educational Levels and Specializations):	**054101**
Qualification Level:	7
Department:	Mathematics
College:	Science
Institution:	Jazan University
Program Specification:	New ☒ updated* ☐
Last Review Date:	28/03/1446 H; 01/10/2024 AD

*Attach the previous version of the Program Specification.

Table of Contents

A. Program Identification and General Information:

1. Program's Main Location:

Department of Mathematics, Main Campus (Male & Female)
College of Science, Jazan Universi

2. Branches Offering the Program (if any):

None

3. System of Study:

☒ Coursework & Thesis ☐ Coursework

4. Mode of Study:

☒ On Campus ☐ Distance Education ☐ Other ……(specify)

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

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

6. Professions/jobs for which students are qualified:

- Teachers, Instructors
- Data analysts, Strategic planning, Administrations
- Researchers, Data analysts
- Lecturers, Tutors, Employees

7. Relevant occupational/ Professional sectors:

- Public Teaching Sector
- Economic Sector
- Research and IT Sectors
- Faculties and Universities

8. Major Tracks/Pathways (if any):

Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)
1.		
2.		
3.		
…		

9. Exit Points/Awarded Degree (if any):

Exit points/Awarded degree	Credit hours
1.	
2.	
3.	

10. Total credit hours: (……36….)

B. Mission, Goals, and Program Learning Outcomes

1. Program Mission:

Produce scientific research cadre to enrich advanced mathematical sciences and allied applications to serve the vibrant society in view of KSA vision-2030.

2. Program Goals:

1. Graduating distinguished and highly qualified mathematicians.
2. To teach math proficiency to the students and work on their creativity and capacity for lifelong learning
3. Use critical thinking and problem solving skills to analyze and assess the validity of mathematical information.
4. Supporting scientific research in the field of mathematics and other supporting disciplines.
5. To promote and keep up with the most recent scientific developments and methods in the area of mathematics, according to societal needs.

3. Program Learning Outcomes:*

Knowledge and Understanding:	
K1	Demonstrate in-depth knowledge of Mathematics, both in theories and applications.
K2	Describe appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts as an application.
K3	Integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information.
Skills:	
S1	Discover and apply the most appropriate mathematical and/or statistical techniques.
S2	Communicate knowledge of key mathematical and statistical concepts, both explicitly and by applying them to the solution of Mathematical problems.
S3	Analyze complex problems in Mathematics and propose solutions using research based knowledge.
S4	Conduct scientific research on certain fields of Mathematics.
Values, Autonomy, and Responsibility:	
V1	Demonstrate leadership qualities with sense of Commitment and accountability.
V2	Inculcate values and ethics in thoughts, expression and deeds.
V3	Show responsibility for personal outputs, intellectual independence.
V4	Promote Mathematics in scientific development as well as in the general education of the society.

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

C. Curriculum:

1. Curriculum Structure:

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Course	Required	**6**	**18**	**50%**
	Elective	**4**	**12**	**33%**
Graduation Project (if any)	-	-	-	-
Thesis (if any)	Required	**1**	**6**	**17%**
Field Experience(if any)	-	-	-	-
Others (.....)	-	-	-	-
Total		**11**	**36**	**100%**

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

2. Program Courses:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	MATH 601	Abstract Algebra-1	Required		3	MATH 601
	MATH 602	Real Analysis-1	Required		3	MATH 602
	MATH 603	Complex Analysis	Required		3	MATH 603
Level 2	MATH 604	Numerical Analysis	Required		3	MATH 604
	MATH 605	Theory of Differential Equation	Required		3	MATH 605
	MATH 606	Mathematical Statistics-1	Required		3	MATH 606
Level 3		Elective Course	Elective		3	
		Elective Course	Elective		3	
		Elective Course	Elective		3	
		Elective Course	Elective		3	
Level 4	699 Math	Thesis	Required		6	699 Math

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

3. Course Specifications:

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

Course Specifications (CS) :
https://www.jazanu.edu.sa/en/colleges/sci/math-department/mathmastercs
Program Specification (PS):
https://www.jazanu.edu.sa/en/colleges/sci/math-department/programspecmastersmath

4. Program learning Outcomes Mapping Matrix:

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

Course code & No.	Program Learning Outcomes											
	Knowledge and understanding				Skills				Values, Autonomy, and Responsibility			
	K1	K2	K3	---	S1	S2	S3	S4	V1	V2	V3	V4
601 Math	I	I	I		I		I	I	I	I	I	I
602 Math	I	I	I		I	I	I	I	I	I		I
603 Math	P	P	P		P	P	P	P			P	P
604 Math	P	P	P		P	P	P	P	P	P	P	
605 Math	I	P	M		I	P	P		I	P	M	M
606 Math	I	P	M		I	M		M	I	P	M	M
607 Math	M	M	M		M		M	M	M	M	M	M
620 Math	M	M	M		M	M			M	M	M	M
621 Math	M	M	M		M	M		M	M	M	M	M
622 Math	M		M		M	M		M	M	M		M
630 Math	M	M	M			M	M	M	M		M	
631 Math	M		M			M	M		M		M	
632 Math	M		M		M		M		M		M	M
633 Math		M	M		M		M		M	M		M
640 Math		M	M		M	M		M	M		M	M
641 Math	M	M	M			M		M			M	M
642 Math	M	M	M		M	M		M		M		M
643 Math	M	M			M	M	M	M	M			M
650 Math	M	M	M		M		M	M	M			M
651 Math	M	M	M			M		M	M	M		
660 Math	M	M	M		M			M	M			M
661 Math		M	M		M	M	M	M	M			M
662 Math	M	M			M			M	M	M	M	M
663 Math	M	M	M		M		M	M	M			
672 Math	M	M	M		M		M	M	M	M		
696 Math	M		M		M	M		M	M	M		
699 Math	M	M	M		M	M	M	M	M	M	M	M

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

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

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

Code	Program Learning Outcomes	Teaching strategies
Knowledge and understanding		
K1	Demonstrate in-depth knowledge of Mathematics, both in theories and applications.	Lectures, Tutorials, Seminars, Direct Reading, Discussion
K2	Describe appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts as an application.	
K3	Integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information.	
Skills		
S1	Discover and apply the most appropriate mathematical and/or statistical techniques.	Lectures, Tutorials, Seminars, Direct Reading, Discussion
S2	Communicate knowledge of key mathematical and statistical concepts, both explicitly and by applying them to the solution of Mathematical problems.	
S3	Analyze complex problems in Mathematics and propose solutions using research based knowledge.	
S4	Conduct scientific research on certain fields of Mathematics.	
Values		
V1	Demonstrate leadership qualities with sense of Commitment and accountability.	Dissertation and its oral defense, Activities, group works,
V2	Inculcate values and ethics in thoughts, expression and deeds.	
V3	Show responsibility for personal outputs, intellectual independence.	
V4	Promote Mathematics in scientific development as well as in the general education of the society.	

6. Assessment Methods for program learning outcomes:

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

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

The tools used will be direct and indirect methods of measurements;

Direct measures:

A set of common rubrics will be used for both grading and assessment at the program level. In some cases, student overall grades in courses may be used through impeded questions in Quiz, Midterm exam or Final Exam. The intent by using rubrics to help students understand departmental expectation, to gauge student progress over time, and to provide a basis for faculty discussions concerning possible areas for program improvement. In most cases these rubric lines will be incorporated into a course specific rubric that contains additional elements specific to the course learning outcomes and expectations. The student grades are reflection of their learning outcomes.

Indirect Measures

- On a periodic basis the department will solicit feedback on graduate skills from alumni and their employers using either surveys or focus groups. These mechanisms may allow the department to reevaluate the target student outcomes to match changing needs in the Mathematics community. The department expects that all numerical responses on this survey will be a 3 or higher and that written responses will be generally positive, yet constructive in improving department programs.
- The department will ask for feedback from graduating students using surveys or focus groups to evaluate their perception of whether the degree has adequately prepared them for their chosen career. This may include job placement and graduate/professional school admission rates. The department expects that all numerical responses on this survey will be a 3 or higher and that written responses will be generally positive, yet constructive in improving department programs.
- The department will periodically hold a focus group with existing Mathematics majors and Mathematics club members. This will provide an opportunity to identify emerging problems quickly before they show up in tracked data. The department expects that student responses will be generally positive, yet constructive in improving department programs.
- The department will periodically collect feedback from faculty and instructors on their perceptions of student strengths and weaknesses.
- The department will periodically collect feedback from the graduates at the end of their graduation semester on learning resources, research facilities and faculty supervisions through **an Additional Supervision survey** to meet the requirements for KPIs no. 4, 13 & 14.

D. Thesis and Its Requirements (if any):

1. Registration of the thesis:

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

- The graduate studies student shall submit her/his proposal, if any, to the Department after she/he fulfills the admission requirements and passes at least fifty percent of the courses with a cumulative GPS of 'Very Good' or better. Upon recommending the proposal's approval, the Department Council shall suggest the name(s) of the supervisor and co-supervisor, if any, or the names of the supervising committee members and its chairperson. The proposal shall be submitted to and approved by the College Council before the Deanship of Graduate Studies approval.
- Topics chosen for a Master's Degree should be original and authentic, while those selected for a Doctoral Degree should be creative and innovative with a noticeable contribution in enhancing the field of knowledge related to the student›s specialty.
- Master's dissertations are written in English and can be translated in other languages in some fields according to University Council resolution based on the recommendation of the Department and the Deanship of Graduate Studies Councils. The submitted dissertation should include a detailed synopsis written in Arabic.

2. Scientific Supervision:

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

- Dissertations shall be supervised by Professors and Associate Professors among the University staff

members. Assistant Professors can supervise a Master›s degree if two years have passed since being appointment in her/ his rank, and have written at least two refereed papers in her/his major, whether published or accepted for publication.

- Qualified and distinguished staff members from outside the University may supervise dissertations through resolution by the University Council based on recommendations by the Department and the Deanship of Graduate Studies Councils.
- A staff member from other departments may co-supervise a dissertation depending on the nature of the work, provided that the main supervisor is from the department in which the student is studying.
- A supervisor, whether solely or in collaboration with others, can concurrently supervise a maximum of four dissertations. When extremely necessary, the number shall be raised to five, based on the Department Council recommendation and approval of the College and the Deanship of Graduate Studies Councils. Each dissertation is equivalent to one hour in the staff member›s teaching load if s/he is the only supervisor or the main.
- Upon terminating the University service of the supervisor or her/his inability to continue with the supervision of the dissertation, the Department proposes a substitute supervisor to be concurred by the College Council and approved by the Deanship of Graduate Studies Council.
- The supervisor shall submit a detailed report at the end of each semester to the Department Chairperson regarding the progress of the student›s research study. A copy of the report shall be sent to the Dean of Graduate Studies.
- Upon completing the dissertation by the student, the supervisor submits a report to the Department Chairperson in this respect in order to continue with the procedures specified by the Council of the Deanship of Graduate Studies.
- If proven that the student is not serious about her/his study, or upon violating any of the research duties based on a report submitted by the supervisor, the Department shall sends her/him a warning letter. If the student does not correct the warning causes, her/his registration shall be cancelled by the Council of the Deanship of Graduate Studies based on the Department Council recommendation.

3.Thesis Defense/Examination:

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

- The examination board is formed by the resolution of the Deanship of Graduate Studies Council based on the recommendations of the Department and College Councils.
- The Master›s examination board should fulfill the following:
  1. An odd number of examiners shall be selected, provided the supervisor is the secretariat.
  2. The minimum number of examiners is three provided that the supervisor and the co-supervisor, if any, do not constitute a majority.
  3. The board members are subject to the requirements of dissertation supervision.
  4. A professor, or at least an associate professor, should be on the examination board.
  5. Resolutions are taken upon the approval of at least two thirds of the board members.
- If the dissertation supervisor fails to be among the examination board due to her/his death, service termination, or on a long period mission abroad, the Department shall propose a substitute approved by the College and the Deanship of Graduate Studies Councils.
- A report signed by all examiners shall be submitted to the Department Chairperson within one week of the examination with one of the following recommendations:
  1. Accepting the dissertation and recommending the degree award.
  2. Accepting the dissertation and suggesting some changes without being re-examined. One of the examination board members shall be assigned to award the degree provided that the corrections

are made within a maximum period of three months from the examination date; the University Council is entitled to make exceptions.

3. Re-examining the dissertation after the corrections are made within a period specified by the Council of the Deanship of Graduate Studies based on the Department Council recommendation. The maximum time period is one year from the examination date.
4. Not accepting the dissertation. Each examiner is entitled to make reservations and state her/his contradictory view point in a detailed report submitted to the Department Chairperson and the Dean of Graduate Studies within two weeks form the examination date.

- The Department Chairperson shall submit the report of the examination board to the Dean of Graduate Studies within a minimum time period of three weeks from the examination date.
- Recommendation of degree award shall be submitted by the Dean of to the University Council to decide on the matter.

H. Student Admission and Support:

1. Student Admission Requirements:

- University Council shall determine the number of students admitted each year to graduate studies programs based on the recommendation of the Council of the Deanship of Graduate Studies, and the proposal of the concerned departments and colleges.
- For admission to Graduate Studies, the applicant must fulfill the following requirements:
  1. To be of Saudi nationality or has an official scholarship if the applicant is non-Saudi.
  2. To have a university degree from a Saudi university or another equivalent accredited university.
  3. To be medically and morally eligible.
  4. To submit two recommendation letters from staff members who taught him/her.
  5. To obtain a written undertaking of approval from employer, if the applicant is an employee.
  6. To study full time if the applicant is a doctorate candidate and the University Council may waive this requirement if necessary.
  7. B.Sc. Grade (3.75 or higher)
  8. English language proficiency (TOEFL 400)
  9. Interview (Pass)
- For admission to Graduate Studies program for a Master's Degree, the final grade of the applicant in the university must be ‹Very Good› or better, but the Council of the Deanship of Graduate Studies may also accept applicants with grade ‹Above Average›. The Council of the Deanship of Graduate Studies, based on the Department Council recommendation and College Council approval, may accept applicants with grade ‹Good› in some programs specified by the University Council, provided that the applicant's average grade in the Bachelor’s majoring courses is ‹Very Good› or better. The Council of the Deanship of Graduate Studies, based on the Department Council recommendation and College Council approval may add other requirements deemed necessary for admission».
- A student may be admitted to a Master's program in a field different from her/his major based on the concerned Department and College Councils recommendation, and the approval of the Council of the Deanship of Graduate Studies.
- For admission to the Master's program, the concerned department may specify that the applicant must undertake a number of complementary courses from an earlier stage, in a period not more than three semesters, taking into consideration the following:
  1. The complementary course must be first of a grade of ‘Good’ or better.
  2. The cumulative GPA in the complementary courses must be ‘Very Good’ or better.
  3. Passing the complementary courses before registering in the graduate studies program. The

department may allow registration in graduate studies only if one or two complementary courses remain to be studied.

4. The time period of the complementary courses is not included in the period specified for obtaining the degree.
5. The complementary courses are not included in the calculation of the cumulative GPA of graduate studies.

- Deanship of Graduate Studies shall be responsible for the applicants' admission and registration in coordination with the Deanship of Admission and Registration.
- The student must not enroll in two graduate studies programs simultaneously.

2. Guidance and Orientation Programs for New Students:

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

Guidance and Support for Students:

Academic advising & counseling service provides guidance and support for students to overcome any academic problems or personal difficulties that may hamper student's academic progress, as well as develops the students' capacities and potentials, that enhances their academic performance. Academic advising and counseling services are basic steps that guarantee a collaborative relationship between faculty members and students. The intent of this collaboration is to facilitate learning by providing opportunities for students to achieve their goals and uphold the academic standards of the college. Each student at the Department of Mathematics is assigned a faculty advisor at the time of his initial enrolment. The faculty advisor is available to solve any problem that might arise during the student program. The University considers student advising by faculty as an important teaching-related activity. The faculty advisor is expected to advise students in planning their academic programs during early registration, and throughout their academic year. The faculty advisor has the following main roles-

- Assign Teaching staff member as academic advisor to a group of students
- Announce reminder about the meeting between advisor and the student
- Monitor student attendance record.
- The academic advisor helps his students examine the course offerings in their major and understand their graduation requirements.
- The academic advisor helps the student explore the career fields within his/her major, and obtain related career information and survey job opportunities.
- The academic advisor serves as a link between the student and the administration by counseling the student on matters of failure, on the procedures for dropping and adding courses, course scheduling, and academic progress.
- The academic advisor must alarm students of the exclusion procedure well in advance and of any subsequent changes that might be enforced during the course of their studies.

In the department of Mathematics and the College of Science there are academic guidance units which aim to:

- Provide accurate and up-to-date information.
- Clarify the requirements, policies and procedures of the Programs being offered.
- Approve students' Programs of study and assist them in identifying appropriate resources.
- Facilitate relationships between the student and others within the University who may also be able to provide relevant assistance.
- Advise on and help in realizing educational and career options.
- Uphold the standards of the University

Orientation Programs for New Students:
Prior to the commencement of a course, students have to attend an Orientation, a program designed to assist them understanding the courses, requirement and general guidelines during their study in the college. The orientation program is conducted in form of short seminars. These seminars will cover course related matters, key policies and procedures, IT services, administrative matters, student services, library and learning services and a tour of campus facilities. Students are provided with a comprehensive Student Orientation Package that includes all the required administrative and organizational information and documentation relating to the students enrolment. The orientation program also provides an opportunity for students to meet other students and the staff of the Institutions. Orientation is given by the Vice Dean for academic affairs and Vice Dean of the college of science. Information is given about the college policies and rules and regulations pertaining to different areas including attendances. Program vision and objectives are explained. Academic advisors are introduced.

3. Student Counseling Services:

(Academic, professional, psychological and social)

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

- Student Academic Counseling Committee is in charge of student counseling.
- Each Faculty is assigned a group of students for counseling.
- Faculty will be available for student counseling at specific office hours during on daily basis.
- Faculty should make a file for each student in his counseling group where student contact information, a copy of student timetable, a copy of student academic record are kept and updated every semester.

4. Special Support:

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

Low achievers:

- Teachers assign those students more assignments, help them during office hours and give them opportunities as and when needed.
- If any students remain with low GPA on request and appeal they are given an opportunity to study a subject from or out of the study plan.

Disable:

- The department, along with the college administrators, tries to create the relevant conditions for the study of students and applicants with special needs without reducing the requirements for their study performance and in accordance with the principles of equal treatment.
- During an exam, an applicant with special needs shall be, at his request and based on the evaluation of his special needs, determined a form of the exam and method of taking it, taking regard of his special needs.

Gifted and talented:

There is a Talented Students Committee in the department who are working with the students providing them opportunities in participating in competitions, workshops, department activities, career orientations etc.

E. Faculty and Administrative Staff:

1. Needed Teaching and Administrative Staff:

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	3	None	None	2	1	3
Associate Professor	10	None	None	7	3	10
Assistant Professor	12	None	None	7	5	12
Technicians and Laboratory Assistant	0	0	0	0	0	0
Administrative and Supportive Staff	4	None	None	1	3	4
Others (specify)						

F. Learning Resources, Facilities, and Equipment:

1. Learning Resources:

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

- A copy of learning resources for each course is kept in the relevant Course File in the Program QA Unit.
- A list of learning resources is kept in the Program QA Unit.
- The list of learning resources is annually updated by teaching Faculty and gets approval by Program Board.
- Student assessment of quality of library services carried out by College QA Unit.
- The updated list of learning resources is then raised to College of Science Deanship and hence to Deanship for Library Affairs.

2. Facilities and Equipment:

(Library, laboratories, classrooms, etc.)

- Some Faculty members are selected every year to attend the Jazan University Book fair to recommend acquisition of new titles.
- Selected senior faculties are in charge of annual evaluation of the adequacy of learning resources.

3. Procedures to ensure a healthy and safe learning environment:

(According to the nature of the program)

College of science is committed to providing a safe and healthy campus environment. Among its highest priorities are the health and safety of all faculty, staff, and students, the visiting public, and members of the neighboring community in order to implement environmental and occupational health and safety programs and to ensure compliance with all relevant governmental laws and regulations. A variety of health care services to students, faculty, staff and community members.

- The Campus Health Clinic is located inside the main campus and a small room over the medical support inside the College of Science building.
- Smoking is prohibited in any University facility and on any University grounds.
- First aid boxes are located in calculus café/meeting room.
- The purpose of the Chemical Safety Program is to ensure the proper handling of hazardous chemicals, as well as hazardous waste management and disposal. Exposure to hazardous chemicals is kept at a minimum by using the appropriate Personal Protective Equipment and by performing experiments in a certified chemical fume hood.
- Fire prevention guidelines are listed in all places
- Emergency Exit doors in all parts with sufficient Signboards in all places.
- Safety and security instructions are announced at the laboratories and the places where students gather.

G. Program Quality Assurance:

1. Program Quality Assurance System:

Provide a link to quality assurance manual.

https://www.jazanu.edu.sa/dev/media/sites/61/2020/05/QMS-Manual.pdf

2. Program Quality Monitoring Procedures:

- All faculty members submit course reports at the end of each semester
- Feedback from Student Assessment of Quality of course evaluation questionnaires.
- Feedback from final Student Assessment of Quality of student experience evaluation questionnaires.
- Feedback from Graduate Assessment of Quality of program evaluation questionnaires.
- Consult specialists in the field of Mathematics outside the department and see their point of view on the process of educational department and the suitability of the curriculum with the developments occurring and advances in the field.
- Questionnaires to governmental and private sector agencies to assess the performance of the employed students and their education.
- Feedback from employer assessment of graduate quality and attributes.

3. Procedures to Monitor Quality of Courses Taught by other Departments:

Program QA Committee is continuously communicate with the department that are responsible for the courses offered such as Computer Science Department in terms of course specifications, course reports, and their suggestion for improvement plans for Mathematics Programs

4. Procedures adopted to ensure the consistency between the program's sections:

(male and female sections, if any).

In sections for male and female students the leaders of both sections participate in institutional governance and be fully involved in strategic planning, decision making, and senior administration with effective and continuing communication between sections. Strategic planning ensures equitable distribution of resources and facilities to meet the requirements of program delivery, research, and associated services in each section and quality evaluations consider performance at each section as well as for the institution as a whole.

- Male and female sections are represented in the membership of relevant committees and councils and participate fully in decision making through processes that are consistent with bylaws and regulations of the Higher Council of Education.
- Main campus and branches are represented in the membership of relevant quality assurance and accreditation committees and councils and participate fully in decision making through processes that are consistent with bylaws and regulations of the Higher Council of Education.
- An effective communication between members from each section on these committees and councils was established, and individuals in the different sections carrying out related activities were fully involved in planning, evaluations and decision making.
- Planning processes and mechanisms for performance evaluation lead to comparable standards in each section while taking account of differing needs.
- Quality indicators, evaluations and reports show results for both sections and branches indicating similarities and differences as well as overall performance.

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

The Assessment and Evaluation Process:

The Mathematics program uses different tools and processes to assess and evaluate the extent to which its PLOs are being attained. These processes are used to gather the data, which is necessary for the assessments. Evaluation, in the form of interpreting the data, is then carried out in order to determine how well the outcomes are being attained. The results of both the assessment and evaluation processes are finally utilized for the continuous improvement of the program. The steps used for the assessment, evaluation and feedback to the continuous improvement of the program follow the following three steps:

1. Assessment tools of the PLOs (i.e., collecting data) can be direct or indirect. Direct assessment of PLOs usually relies on the course work, whereas indirect assessments of PLOs are usually obtained by using surveys. This step includes designing forms of surveys and appropriate questions for the specific and applicable data.
2. The collected data is analyzed and compared to a pre-set performance indicator, which constitutes the evaluation processes.
3. Checking the degree to which the data evaluation results meet the pre-set targets will be the force for the continuous improvement processes.

Course mapping to PLOs:

To set the stage for the assessment process, the material covered in each course, together with its expected course learning outcomes (CLOs), are used to identify the certain number of program learning outcomes that are most probably be covered by the course. It is important to mention here that each of the course CLOs should be associated with one of the chosen PLOs. Thus, the PLO with a single CLO

implies that this CLO statement may be identical with that of the PLO. We should also emphasize that the capstone courses are exceptions to the above-mentioned mapping scheme and can have as many PLOs as needed; in fact, we mapped the capstone courses to practically all PLOs.

To this end, each course has identified some specific number of measurable Course Learning Outcomes (CLOs) and these CLOs are mapped to the chosen different PLOs. This process of course-PLO mapping is carried out for each Department course.

Program Learning Outcomes:

In order to assess and evaluate the extent to which the PLOs are being attained, the Mathematics Program uses various processes. These processes are defined to keep data gathering efficient and effective, and the evaluation pertinent to the process of continuous improvement. To achieve these goals, two types of assessments, direct and indirect are performed. The indirect assessment is performed using surveys while the direct assessment results are obtained from student coursework-based evaluations.

In its planning for the present and for future expanded assessment processes, the program faculty have suggested and adopted the ambitious assessment process of Figure-1.

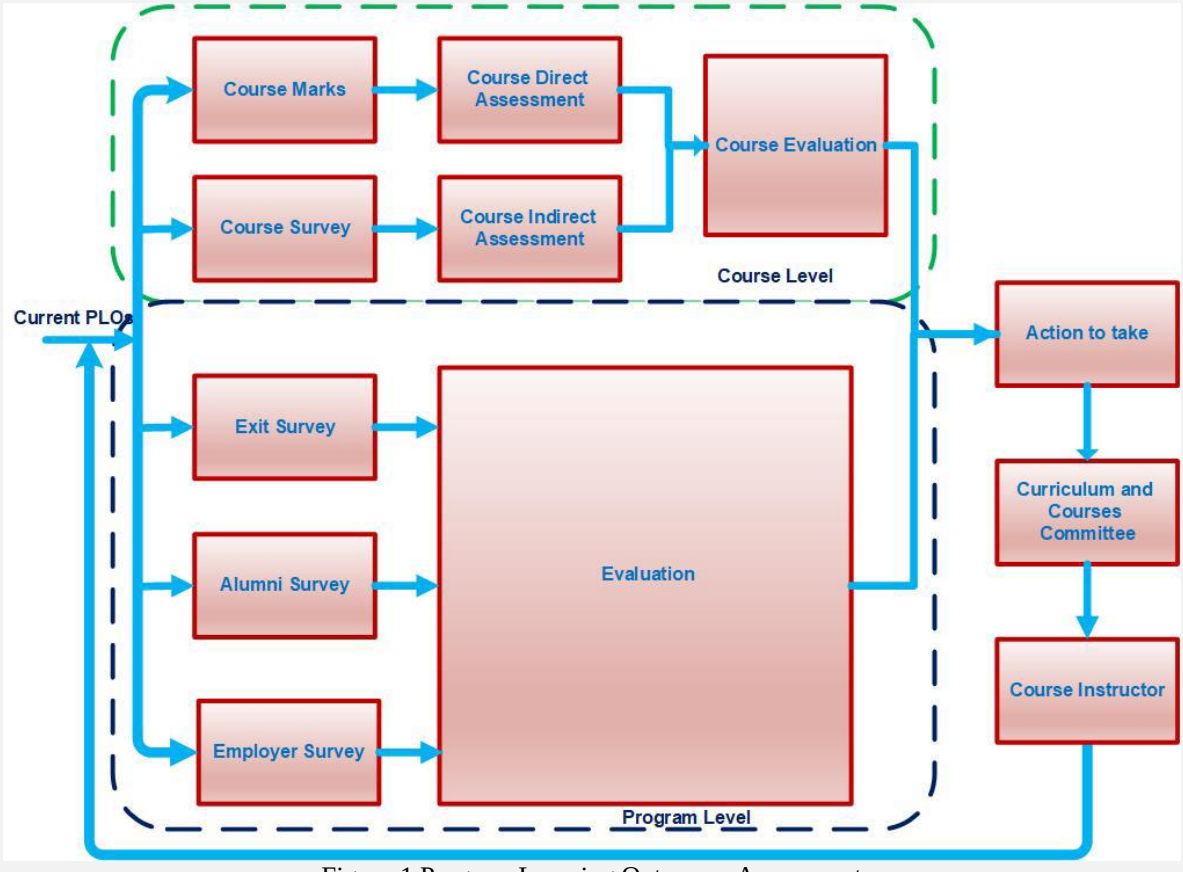

Figure-1 Program Learning Outcomes Assessment

Table-1 describes how the Program Learning Outcomes are assessed. It contains the method of assessment, data sources with which these assessment processes are carried out, and how the data is collected.

Table-1 Program Learning Outcomes Assessment Tools

Method of Assessment	Data Sources	How collected	Performed by	Collected By	Evaluated By
Direct Assessment Method	Course Assessment Report based on student marks	Electronic Copy	Faculty Members	Quality and Accreditation Committee	Quality and Accreditation Committee
Indirect Assessment Method	Course survey Evaluation		Students	Quality and Accreditation Committee	
	Program Evaluation survey				
	Alumni Survey		Alumni		
	Employer Survey		Employer		

Direct Assessment:

The direct assessment of the outcomes usually relies on the coursework and uses a variety of tools that include combinations of final exam, midterm tests, quizzes, homework, laboratory works, assignments, practical, projects, presentations, etc. The assessment tools do however vary from course to course.

Indirect Assessment:

For our indirect assessment, different surveys are conducted.

Course evaluation survey is conducted towards the end of a course. In this regard, formal written surveys targeting the program learning outcomes are solicited from students at the end of the Mathematics courses.

Program Evaluation survey is filled in by the graduates at the end of their graduation semester. The graduate survey contains questions that directly target every one of the Program Learning Outcomes.

An **Alumni survey and employer survey** is filled in by the alumni's and employers respectively that directly target every one of the Program Learning Outcome

The graduates fill in **an Additional Supervision survey** at the end of their graduation semester on learning resources, research facilities and faculty supervisions to meet the requirements for KPIs 4, 13 & 14.

6. Program Evaluation Matrix:

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Leadership	Peer Review	Internal Peer Review	End of year
Teaching & Learning	Student Feedback	Student Questionnaire	End of semester
Assessment	Peer Review	Internal Marking Revision	End of semester
Learning Resources	Benchmarking	National Benchmarking	End of year
Scientific Research	Impact	• No. of ISI publications / faculty / year • No. of Citations / faculty / year	End of year
Partnerships	Effectiveness	Annual Report	End of year
Graduates	Feedback	Alumni Questionnaire	End of year

Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)
Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others.
Evaluation Methods (e.g., Surveys, interviews, visits, etc.)
Evaluation Time (e.g., beginning of semesters, end of the academic year, etc.)

7. Program KPIs:*

The period to achieve the target (____) year(s).

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
1	**PG-1**	Percentage of achieved indicators of the program operational plan objectives	**70%**	Percentage of the operational plan objectives of the program that achieved to the total number of indicators targeted for these objectives in the same year	End of the academic year
2	**PG-2**	Students' Evaluation of quality of learning experience in the program	**4**	The average ratings of all questions in Student experience survey (SES)	End of Semester
3	**PG-3**	Students' evaluation of the quality of the courses	**4**	The average ratings of all questions in Course Experience Survey (CES)	End of Semester
4	**PG-4**	Students' evaluation of the quality of scientific supervision	**4**	Average students' overall rating of the quality of scientific supervision Survey	End of the academic year
5	**PG-5**	Average time for students' graduation	**2** (years)	Average time (in semesters) spent by students to graduate from the program.	End of the academic year
6	**PG-6**	Rate of students dropping out of the program	**10%**	Percentage of students who did not complete the program to the total number of students in the same cohort.	End of the academic year
7	**PG-7**	Graduates' employability	**50%**	Percentage of graduates from the program who within a year of graduation were employed to the total number of graduates in the same year.	End of the academic year
8	**PG-8**	Employers' evaluation of the program graduates' competency	**3.5**	Average of overall rating of employers for the competency of the program graduates survey.	End of the academic year
9	**PG-9**	Students' satisfaction with the provided services	**4.2**	Average of students' satisfaction rate with the various services provided by the program survey.	End of the academic year
10	**PG-10**	Ratio of students to faculty members	**1:2**	Ratio of the total number of students to the total number of full-time and full-time equivalent faculty members participating in the program.	End of Semester
11	**PG-11**	Percentage of faculty members' distribution based on academic	**75%**	Percentage distribution of faculty members participating in the program based on academic	End of Semester

		ranking		ranking.	
12	**PG-12**	Proportion of faculty members leaving the program	**2%**	Proportion of faculty members leaving the program annually for reasons other than age retirement to the total number of faculty members.	End of the academic year
13	**PG-13**	Satisfaction of beneficiaries with learning resources	**3.5**	Average of beneficiaries' satisfaction rate with learning resources on survey.	End of Semester
14	**PG-14**	Satisfaction of beneficiaries with research facilities and equipment	**3.5**	Average of beneficiaries' satisfaction rate with research facilities and equipment survey.	End of the academic year
15	**PG-15**	Percentage of publications of faculty members	**75%**	Percentage of faculty members participating in the program with at least one research publication during the year to total faculty members in the program.	End of the academic year
16	**PG-16**	Rate of published research per faculty member	**5%**	The average number of refereed and/or published research per each faculty member participating in the program during the	End of the academic year
17	**PG-17**	Citations rate in refereed journals per faculty member	**15**	The average number of citations in refereed journals from published research	End of the academic year
18	**PG-18**	Percentage of students' publication	**2%**	Percentage of students who published their research or presented papers in conferences to the total number of students in the program during the year.	End of the academic year
19	**PG-19**	Number of patents, innovative products, and awards of excellence	**2**	Number of Patents and innovative products National and international excellence awards obtained annually by the students and staff of the program.	End of the academic year

*including KPIs required by NCAA

H. Specification Approval Data:

Council / Committee	BOARD OF MATHEMATICS DEPARTMENT
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Date	**29/031446 H; 02/10/2024 AD**