جامعة الملك خالد
KING KHALID UNIVERSITY

College of Engineering

Mechanical Engineering Department

2026-2027

HANDBOOK

Renewable Energy and The Environment

STUDENT HANDBOOK & GRADUATION REGULATIONS

Master in Renewable Energy and the Environment
King Khalid University | Executive & Academic Guide

This official document governs the academic regulations, graduation standards, degree pathways, and student standards for the Master in Renewable Energy and the Environment at King Khalid University It incorporates the updated Implementing Rules for Regulations Governing Graduate Studies at Universities (King Khalid University Council Resolution No. 46/10/6 dated 02/20/1447 AH / August 14, 2025 AD) and aligned with the Saudi Unified Classification of Academic Degrees and the KSA National Qualifications Framework (NQF).

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1. Executive Summary & Strategic Objectives

The Master in Renewable Energy and the Environment program is designed to train advanced scientific and technical leaders to drive KSA's clean energy transition, environmental sustainability, and green growth goals as envisioned under Saudi Vision 2030 and the Saudi Green Initiative.

- **Degree Granted:** Master in Renewable Energy and the Environment.
- **Institutional Authorization:** Approved by King Khalid University Council in accordance with the Council for University Affairs framework.
- **Program Classification:** Compliant with the Saudi Unified Classification of Academic Levels and Specializations and the Saudi National Qualifications Framework (NQF).

1.1. Vision and Mission

In alignment with Saudi Vision 2030 and King Khalid University's strategic commitment to sustainable regional development and economic enhancement, the Mechanical Engineering Department (MED) has systematically integrated renewable energy across its academic, research, and laboratory frameworks. The Master in Renewable Energy and the Environment program has developed its vision and mission statements aligned with that of college and university.

- **Vision:** Achieving academic and technological leadership in the field of Mechanical Engineering, contributing through academic and applied research, and participating in the development of society.
- **Mission:** To prepare qualified engineers and researchers with a high level of academic knowledge and skills in renewable energy and environment assisted with modern technology to serve the community and to meet the industrial demands of the kingdom of Saudi Arabia.

1.2. Program Educational Objectives

The Graduate Studies Regulations, the program has developed its educational objectives aligned with the following:

- **Advanced Technical Competence:** Provide advanced theoretical and practical knowledge in renewable energy technology (solar, wind, geothermal, bioenergy, hydrogen) and environmental systems engineering.
- **Scientific & Applied Research:** Train researchers capable of producing high-impact scientific output, conducting innovative research, and solving pressing regional and global environmental challenges.
- **Environmental Leadership & Policy:** Equip graduates with policy, economic, and lifecycle analysis tools to formulate sustainable energy transition strategies and carbon neutrality frameworks.
- **Ethical & Professional Standards:** Foster adherence to academic integrity, institutional compliance, and professional ethics in engineering and research practice.

PEO CODE	PEO STATEMENT
PEO-1	Graduates will establish successful professional careers in renewable energy, environmental, and related industries through the application of advanced knowledge and technical expertise.
PEO-2	Graduates will demonstrate ethical leadership, professional responsibility, and a commitment to sustainable practices while addressing societal and environmental challenges.

PEO CODE	PEO STATEMENT
PEO-3	Graduates will pursue lifelong learning, advanced studies, professional certifications, research, and continuous professional development to adapt to evolving technologies.
PEO-4	Graduates will assume leadership and management roles in multidisciplinary renewable energy and environmental projects, contributing to organizational growth and innovation.
PEO-5	Graduates will contribute to society through community engagement, professional service, collaboration with stakeholders, and the promotion of sustainable development.

1.3. Program Learning Outcomes

The Master in Renewable Energy and the Environment program designed its program learning outcomes satisfying the graduation characteristics defined by NQF at professional level-7. It also ensures that ABET general outcomes (ANSAC) are satisfied. Upon the completion of the program, students are able to

PLO CODE	PLO STATEMENT
PLO-1	Demonstrate advanced, integrated knowledge of renewable energy technologies, environmental science, mathematics and engineering principles sufficient to analyze complex energy–environment problems.
PLO-2	Conduct independent research by formulating clear research questions, selecting appropriate methodologies, collecting, and analyzing data, and drawing evidence-based conclusions in renewable energy and environmental contexts.
PLO-3	Design, model, and evaluate renewable energy systems (solar, wind, bioenergy, hydro, hybrid etc.) and associated environmental control measures using contemporary simulation and experimental tools.
PLO-4	Evaluate the environmental, economic, and technical performance of energy systems using life cycle assessment, cost–benefit analysis, and multi criteria decision methods.
PLO-5	Integrate sustainability principles and regulatory, societal, and public health considerations into the planning and implementation of energy and environmental projects.
PLO-6	Apply advanced data analysis, monitoring, and digital tools (e.g., MATLAB/Python, energy modeling software) to support assessment, forecasting, and system optimization.

PLO CODE	PLO STATEMENT
PLO-7	Communicate complex technical concepts, results, and recommendations clearly and professionally in written reports, scientific publications, and oral presentations to diverse stakeholders.
PLO-8	Demonstrate leadership and collaborative skills in multidisciplinary teams, managing projects, resources, and stakeholder engagement to achieve ethical and timely outcomes.
PLO-9	Uphold professional ethics, integrity, and safety standards in research, consulting, and implementation of energy and environmental solutions.
PLO-10	Pursue lifelong learning and professional development, critically reflect on practice, and contribute to innovation and knowledge dissemination in renewable energy and environmental sustainability

2. Admission, Registration & Academic Regulations

2.1. Admission Eligibility & Requirements

Candidates applying for the M.Sc. program must satisfy the general university graduate admission regulations alongside program-specific criteria:

1. The applicant must be a Saudi citizen, born to a Saudi mother, or a non-Saudi who has received an official scholarship for graduate studies.
2. The applicant must hold a university bachelor's degree in science or engineering from a Saudi university or another recognized institution, accompanied by an equalization certificate issued by the Ministry of Education meeting the following requirements:
    - At least 30 credit hours of Mathematics & Basic Science Courses at the Bachelor's level.
    - Combination of college-level mathematics and sciences (some with laboratory and/or experimental experience) appropriate to the discipline.
    - Advanced technical and/or science topics appropriate to the program.
    - A general education component that complements the technical and scientific content of the curriculum.
    - Practice in a field of applied or natural sciences through a curriculum culminating in comprehensive projects or experiences based on the cumulative knowledge and skills acquired in earlier course work.
3. The applicant must be of good conduct and medically fit.
4. The applicant must undergo the competitive selection criteria applied among candidates.
5. English language test results issued by private or unaccredited institutes shall not be accepted.
6. If the specific requirements of the program include passing the General Aptitude Test for University Graduates (Postgraduate GAT), the test results shall not be accepted if more than five years have passed since the test date.
7. If the specific requirements of the program include English language proficiency, the applicant must submit the result of one of the approved English language tests, namely: TOEFL, IELTS, or STEP. The

applicant shall be exempted from this requirement if they hold a bachelor's degree, provided that the studies for that degree were conducted entirely in English.

8. If the program is tuition-based, the payment of tuition fees applies (the specific tuition fees for each program do not include fees for complementary/remedial courses if any, fees for courses failed by the student, or fees for additional semesters if the student fails to obtain the degree within the specified duration of the program).

2.2. Supplementary Course Requirements

Where an applicant holds a degree in a related field but lacks core foundational prerequisites, the Department Council may mandate supplementary undergraduate or foundational courses:

- **Time Limit:** Supplementary coursework must be completed within a maximum duration of one academic year.
- **Passing Standard:** Students must pass all supplementary courses on their first attempt with a minimum grade of 'High Good' in each course, maintaining an aggregate supplementary GPA of at least 'Very Good' (3.00/5.00).
- **GPA Calculation:** Supplementary courses are recorded on the transcript but do not count toward the cumulative graduate GPA.
- **Registration Restriction:** Graduate-level courses cannot be registered until all prerequisite supplementary courses are successfully cleared.

2.3. Postponement & Leave of Absence

- **Admission Postponement:** Admitted students may request a one-time admission deferral prior to registering for courses. The maximum deferral period is one academic year and does not count toward the degree completion time limit.
- **Study Postponement:** Enrolled students who have completed at least one semester may apply to postpone their studies for a cumulative maximum of one academic year.

2.4. Course Withdrawal & Excused Absences

- **Course Withdrawal:** A student may formally withdraw from a course or semester load prior to final exams in accordance with the university calendar upon departmental recommendation and college dean approval.
- **Withdrawal Limits:** A student may not withdraw from the same course more than once. Approved withdrawal periods are counted within the maximum statutory timeframe for degree completion.
- **Supplementary Prohibition:** Students enrolled in supplementary courses are strictly prohibited from withdrawing or excusing themselves from supplementary requirements.

3. Curriculum

The program is explicitly engineered to train advanced engineering professionals to design, optimize, and manage complex clean energy architectures while addressing the environmental challenges inherent to hot and arid climates. The curriculum bridges theoretical thermodynamic and fluidic principles with applied green technologies. Graduate-level electives and core coursework focus heavily on advanced energy efficiency, system optimization across industrial scale arrays, solar thermal energy storage systems, and advanced membrane-based desalination integration.

3.1. Program Structure

The Master in Renewable Energy and the Environment offers an approved academic completion pathway in accordance the University Executive Regulations:

Academic Component	Credits distribution
Core Coursework Units	12 Credit Hours (4 Core Courses)
Elective Coursework Units	15 Credit Hours (5 Elective Courses)
Project	6 Credit Hours (Applied Research Project)
Total Program Credits & Duration	33 Credits

3.2. Study Plan

Level	Course Code	Course Title	Required or Elective	Credit Hours	Theory	Lab
Level 1	7161-ME-3	Renewable Energy Systems	Required	3	3	--
	7162-ME-3	Environment And Sustainability	Required	3	3	--
	7163-ME-3	Advanced Heat Transfer	Required	3	3	--
Level 2	7164-ME-3	Solar Energy	Required	3	3	--
	71XX-ME-3	Elective-1 (List-1)	Elective	3	3	--
	71XX-ME-3	Elective-2 (List-2)	Elective	3	3	--
Level 3	71XX-ME-3	Elective-3 (List-3)	Elective	3	3	--
	71XX-ME-3	Elective-4 (List-4)	Elective	3	3	--
	7185-ME-3	Project	Required	3	3	3
Level 4	71XX-ME-3	Elective-5 (List-4)	Elective	3	3	3
	7185-ME-3	Project	Elective	3	3	3

Elective Courses:

Level	Course Code	Course Title	Credit Hours	Theory	Lab
List-1	7166-ME-3	Numerical Methods	3	3	--
	7168-ME-3	Photovoltaic Energy Systems	3	3	--
	7169-ME-3	Geothermal Energy	3	3	--
	7170-ME-3	Advanced Fluid Mechanics	3	3	--
List-2	7171-ME-3	Wind Energy	3	3	--
	7173-ME-3	Energy Conversion	3	3	--
	7174-ME-3	Energy Storage Systems	3	3	--
	7175-ME-3	Electrical Systems Related to Renewable Energy	3	3	--
List-3	7165-ME-3	Energy Efficiency	3	3	--
	7172-ME-3	Finite Elements Method	3	3	--
	7177-ME-3	Computational Fluid Dynamics	3	3	--
	7179-ME-3	Advanced Mathematics	3	3	--
List-4	7180-ME-3	Economic Aspects of Renewable Energy	3	3	--

Level	Course Code	Course Title	Credit Hours	Theory	Lab
	7181-ME-3	Energy Comfort in Buildings	3	3	
	7182-ME-3	Environmental Pollution	3	3	
	7183-ME-3	Energy Management	3	3	
	7184-ME-3	Desalination	3	3	
	7176-ME-3	Energy Policy, Planning and Sustainable Development	3	3	

4. Academic Grading and Exam Regulations

4.1. Grading System & Minimum GPA Requirements

Graduate coursework evaluation follows strict quality thresholds:

- **Course Passing Standard:** The minimum passing grade in any individual graduate course is 'High Good'. Receiving a lower grade requires course repetition.
- **Cumulative GPA Threshold:** To remain in Good Academic Standing and qualify for graduation, a student must maintain a cumulative GPA of at least 'Very Good' (3.75 out of 5.00).
- **Academic Probation:** If a student's cumulative GPA falls below 'Very Good' for two consecutive semesters, academic probation/suspension rules are invoked under University Executive Regulations.

4.2. Examination Regulations

For program tracks or specialized research profiles requiring a Comprehensive Examination:

- **Exam Structure:** The comprehensive exam evaluates broad domain competence across the renewable energy systems and environmental science. It comprises two mandatory components: Written Examination (100 Marks) and Oral Defense Examination (100 Marks).
- **Passing Standard:** To pass the comprehensive exam, the candidate must score at least 70% in each individual component (Written and Oral).
- **Retake Rule:** A student who fails either component is granted a single retake opportunity. Failure to pass the retake results in academic deregistration.

5. Master's Research Project Regulations

5.1. Proposal Registration & Advisory Assignment

- **Eligibility:** A student is eligible to formally submit a project research proposal after completing at least 50% of the total units with a cumulative GPA ≥ 3.75/5.00.
- **Advisor Appointment:** The Department Council assigns an Academic project Supervisor upon approval of the research plan by the College Council.
- **Scope Changes:** Any major modification exceeding 25% of the approved research scope or title requires formal re-approval by the Department and College Councils.

5.2. Project Progress Monitoring & Warnings for Non-Seriousness

- A student in the thesis phase is considered **unserious** if negligence is proven, if they are not in good academic standing, or if they fail to comply with the supervisor’s instructions to complete assigned tasks within specified timeframes using the university’s approved communication channels, as evidenced by a detailed report from the thesis advisor.

- **First Warning:** If a lack of seriousness is confirmed for the first time, the student shall be issued a first formal warning via an official letter approved by the relevant department chair, based on a detailed report by the thesis supervisor clarifying the extent of the negligence. The student is required to rectify the situation within a period not exceeding two months from the date the warning was issued.
- **Second and Final Warning**: If the student continues to demonstrate a lack of seriousness or fails to address the reasons for negligence outlined in the first warning, a second and final warning will be issued via an official letter approved by the department chair, based on a thesis supervisor's report detailing the ongoing negligence. The student must correct their status within a period not exceeding one month.
- **Suspension / Dismissal**: If the student fails to comply after receiving two consecutive warnings and shows no tangible improvement or remediation, they shall be suspended, based on the thesis supervisor's report and the recommendation of both the Department and College

6. Graduation Honors & Scientific Distinction

Graduating students maintaining exemplary academic performance are awarded university honors upon graduation:

Honors Rank	Cumulative GPA Threshold
First-Class Honors	GPA ≥ 4.75 / 5.00
Second-Class Honors	4.25 ≤ GPA < 4.75 / 5.00

To be eligible for first- or second-class honors, the student must meet the following criteria:

a) The student must not have failed any course in the program, whether at this university or at any other university.

b) The student must have fulfilled all graduation requirements within a period not exceeding the standard average duration of study, subject to the minimum and maximum limits for enrollment at their college or institute.

An exception to the time-limit rule in paragraph (b) may be granted by the Scientific Committee—upon the recommendation of the Judging and Defense Committee and with the endorsement of both the Department and College Councils—provided that the total period does not exceed the limit for obtaining the degree, and that one of the following exceptional research conditions is met:

- The student has at least one scientific research paper derived from their dissertation published or accepted for publication in journals ranked within the top 10% of the Web of Science (Science Citation Index) database for scientific disciplines, or in journals ranked in the first quartile (Q1) of the Scopus database for the humanities.
- The student has at least two research papers extracted from the dissertation that have been published or accepted for publication in journals ranked in the first quartile (Q1) of the Web of Science database for scientific disciplines, or in journals classified in the first quartile (Q1) of the Scopus database for the humanities.
- The student has registered a patent based on a portion of their thesis with one of the international patent offices accredited by the University Scientific Council.

7. Student Appeals, Academic Integrity & Early Exit Options

7.1. Early Exit Qualifications

Without prejudice to the provisions set forth in the classification and framework, and in accordance with the regulations approved by the University Council—based on the recommendation of the Standing Committee, the endorsement of the relevant Vice President or Deputy, and the recommendations of the Department and College Councils—the student shall be awarded:

- **An Advanced Diploma:** Upon passing a specified number of courses in the Master's program, provided that the total number of courses completed does not qualify the student for a Master's degree.

7.2. Academic Integrity & Code of Conduct

- **Plagiarism & Research Ethics:** Plagiarism, data fabrication, unauthorized collaboration, or breach of research ethics in coursework or project preparation will result in immediate disciplinary referral, project rejection, and potential academic deregistration under University Disciplinary Bylaws.
- **Similarity Index Threshold:** All project manuscripts are subjected to mandatory automated plagiarism detection software prior to committee submission. Similarity indices must not exceed 15% overall, with <3% from any single source.

7.3. Re-Enrollment & Readmission Regulations

- **Readmission Window:** A student whose enrollment was suspended may apply for readmission within three academic years. Courses previously completed will be evaluated by the Department Council to determine credit retention.
- **Single Attempt Rule:** Readmission is granted only once during a student's academic tenure.

8. Program Management

8.1. Committees

The program level quality assurance is ensured by Postgraduate and scientific committee and subcommittees. The periodic proposals and recommendations are discussed in the council to take appropriate actions in coordination with other committees in the department.

8.2. Faculty

Course level quality assurance is ensured by individual faculty members who has the responsibility to deliver the assigned courses and supervise the student projects. Student advising and career support is another dedicated responsibility among the faculty members.

- **Dr. Irfan Anjum Badruddin Magami (Professor):** Holds a Ph.D. in Heat Transfer from Universiti Sains Malaysia. He is a globally recognized scholar, listed among the top 2% of scientists in the world by Elsevier, and teaches Advanced Heat Transfer (7163-ME-3) and Advanced Numerical Methods (71013).
- **Dr. Salem Algarni (Professor):** Holds a Ph.D. from the University of Arkansas, USA, specializing in thermal engineering and building energy efficiency systems.
- **Dr. Sultan Saad Alqahtani (Associate Professor):** Completed his Ph.D. at North Carolina State University, USA, specializing in thermal fluids and computational fuel chemistry acceleration. He delivers Renewable Energy Systems (7161-ME-3) and Energy Efficiency (71653).
- **Dr. Mostafa Abdelmohimen (Associate Professor):** Holds a Ph.D. from Benha University, Egypt, specializing in fluid mechanics and turbomachinery. He teaches Environment and Sustainability (7162-ME-3).

- **Dr. Talal Saeed Alqahtani (Associate Professor):** Completed his Ph.D. at Arizona State University, USA, specializing in thermochemical energy storage, and is recognized on the Stanford/Elsevier top 2% scientists list. He teaches Solar Energy (7164-ME-3).
- **Dr. Ahamed Saleel Chandu Veetil (Associate Professor):** Earned his Ph.D. from the National Institute of Technology (NIT) Calicut, India, focusing on thermofluids, mass transport, and electro-osmotic mixing. He teaches Energy Management (7183-ME-3).
- **Dr. Ali Ahmed Alqahtani (Assistant Professor):** Earned his Ph.D. from the University of Liverpool, UK, focusing on pulsating heat pipes and two-phase passive thermal management. He teaches Energy Policy, Planning and Sustainable Development (7176-ME-3).
- **Dr. Sultan Dahman Alshehery (Associate Professor):** Completed his Ph.D. at the University of Akron, USA, specializing in alternative engine fuels, and teaches Photovoltaic Energy Systems (7168-ME-3).
- **Dr. Saad Ayed Alshahrani (Associate Professor):** Earned his Ph.D. from Michigan State University, USA, specializing in solar-biogas hybrid power cycles, and teaches Energy Conversion (7173-ME-3).

9. Learning Resources and Facilities

9.1. Learning Resources and Books

All students are provided with a login and password for the intranet to enter the digital library to access the thesis, relevant publications, and other archives. Textbooks, references, specialized periodicals, web-based resources, educational CDs, and other media teaching resources, can be get issued from the central library of the University. E-Learning labs are available for the students to facilitate online teaching and learning processes. Course materials (lecture handouts, presentations, tutorial sheets, etc.) by the instructors can also be downloaded from the Blackboard.

9.2. Renewable Energy Laboratory

Located at main campus in Al-Faraa, this facility serves as an essential experiential asset supporting core course laboratories, senior graduation design trajectories, and subject-specific project mandates. The laboratory is equipped with six specialized, industrial-grade experimental testing units:

- **Wind Energy Conversion System:** Allows students to experimentally characterize aerodynamic torque generation, turbine cut-in velocities, and electrical power generation profiles.
- **Hybrid Solar–Wind Energy System:** Facilitates the study of integrated micro-grid optimization, structural load balancing, and battery management parameters under varying multi-source load profiles.
- **Photovoltaic Module Characterization System:** Used to isolate solar irradiance levels, cellular surface temperatures, and tracking angles to establish precise operational efficiency curves.
- **Flat-Plate Solar Water Heating System with Artificial Solar Simulator:** Empowers indoor experiential training using an artificial light array to analyze transient thermal efficiency and fluidic mass flow optimization without outdoor climatic variables
- **Solar Thermal Energy Experimental System:** Configured to measure advanced heat transfer mechanics, heat-pipe performance criteria, and localized thermal storage characteristics.
- **Geothermal Heat Pump Experimental Test Facility:** Provides a comprehensive testing ground for examining deep-bore thermal exchange, cycle coefficient of performance (COP), and multi-zone climate modulation.