VISION رؤيـــة 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

جامعة الحدود الشمالية
NORTHERN BORDER UNIVERSITY
كلية الهندسة

Industrial Engineering Program

At Northern Border University

Program Handbook

1446 - 2024/2025

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1. MESSAGE FROM THE HEAD OF THE DEPARTMENT

Dear Industrial Engineering Students,

Welcome to the Department of Industrial Engineering at Northern Border University. This handbook is your comprehensive guide to our program, designed to equip you with the knowledge and skills needed to excel in this dynamic field.

Within these pages, you will find detailed information about our curriculum, both the previous and updated versions, ensuring you have a clear understanding of the academic journey ahead. We have outlined our program's mission, goals, and Program Learning Outcomes (PLOs), which serve as the foundation for your educational experience.

Our faculty and staff are dedicated to providing you with a supportive and enriching learning environment. We encourage you to actively engage in your studies, participate in extracurricular activities, and take advantage of the many resources available to you.

We are confident that this handbook will be a valuable resource throughout your academic journey. Please do not hesitate to reach out to your academic advisors or faculty members if you have any questions or need further guidance.

We wish you all the best in your studies and future careers.

Sincerely,

Dr. Majed Mohammed MASMALI

Head of the Department of Industrial Engineering

2. ABOUT THE INDUSTRIAL ENGINEERING DEPARTMENT

Established in 2007, the Department of Industrial Engineering at Northern Border University's College of Engineering offers a specialized program in Industrial Engineering. This program leads to a Bachelor of Science degree in Industrial Engineering, and its first batch of graduates successfully completed their studies in the academic year 2012/2013 (corresponding to 1433/1434 AH).

The Industrial Engineering Program Mission and Goals directly support the mission of the Northern Border University as well as the mission of the College of Engineering in providing excellent engineering education and research that generate value for the community and contributing to the development of society by preparing high qualified and motivated Industrial Engineering graduates able to apply the acquired knowledge successfully with engineering professional ethics in a competitive global environment. Furthermore, the IEP encourages its faculty members to carry out advanced research on topics that are in direct relation with the needs of society.

MISSION STATEMENT OF THE NORTHERN BORDER UNIVERSITY

We are a regionally serving comprehensive university committed to educational excellence. Guided by our core values, heritage, and place, we deliver innovative educational programs characterized by outcomes that leverage the human, economic, cultural, natural resources and mining of the Northern Border's region and beyond.

MISSION STATEMENT OF THE COLLEGE OF ENGINEERING

To provide high quality engineering programs, distinguished scientific research and contribute to the community service to meet the needs of development and mining fields in the northern border region and throughout the kingdom.

MISSION OF THE INDUSTRIAL ENGINEERING PROGRAM

To prepare qualified industrial engineering graduates able to compete nationally and internationally, foster scientific research in industrial engineering and related fields and contribute to community service.

CORE VALUES

1. Integrity.
2. Community Engagement and Civic Responsibility.
3. Accountability.
4. Collaboration.

UNIVERSITY'S GRADUATES' ATTRIBUTES

NBU's Graduates	NBU's Learning Outcomes
National identity	Demonstrate high standards of ethical and socially responsible behavior, as well as academic and professional honesty and integrity; contribute to finding solutions to social problems; and commit to being a responsible citizen.
Self-management & Critical thinking	Demonstrate self-management skills, self-learning and critical thinking, the ability to take initiative to self-develop according to specific standards, and ability to present evidence and arguments to make a decision unbiasedly.
Digital culture	Effectively use information technology, analytical, mathematical, and statistical tools to perform data analysis, suggest solutions, and solve problems using critical thinking.
Teamwork	Have the ability to lead a team, assume responsibility for performing tasks and developing work, achieve goals effectively, and promote health, psychological and social aspects.
Entrepreneurship	Identify the function of entrepreneurship and its requirements in the successful, commercial application.
Communication skills	Effectively communicate both verbally and in writing, using appropriate presentation forms, scholarly language, adequate reasoning for various issues and dealing with beneficiaries.

PROGRAM LEARNING OUTCOMES (PLOs)

By the time of graduation, the students of the Industrial Engineering Program will be able to:

Domains	PLOs Code	PLOs
Knowledge & Understanding	**K1**	Demonstrate depth and breadth of understanding of theories, principles and concepts underlying industrial engineering discipline with awareness of the current development in the field.
Skills	**S1**	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
	S2	Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
	S3	Communicate effectively with a range of audiences.
	S4	Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
Values, Autonomy, and Responsibility	**V1**	Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
	V2	Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
	V3	Acquire and apply new knowledge as needed, using appropriate learning strategies.

PROFESSIONAL OCCUPATIONS/JOBS:

The Industrial Engineering Program is designed to prepare students for successful careers in industrial engineering, enabling them to assume leadership roles in the design, improvement, and implementation of integrated systems involving people, materials, information, equipment, and energy. Graduates of the program will possess specialized knowledge and skills in mathematical, physical, and social sciences, along with engineering analysis and design methods. This expertise empowers them to specify, predict, and evaluate the outcomes of such systems.

Industrial engineers contribute significantly to enhancing efficiency and productivity across diverse industries, including manufacturing, healthcare, finance, services, and education. The following examples are professions for Industrial Engineering graduates:

- Industrial Engineer
- Operations Engineer
- Production Engineer/Manager
- Quality Assurance Engineer/Manager
- Manufacturing Engineer/Manager
- Safety Engineer
- Maintenance Engineer
- Methods Engineer
- Logistics and Supply Chain Manager/Director
- Systems Analyst/Engineer
- Project Engineer/Coordinator/Manager
- Product Development Engineer
- Facilities and Distribution Engineer
- Plant Ergonomist
- Customer Service Engineer/Manager
- Materials/Procurement Engineer/Manager
- Management Systems Engineer/Consultant
- Lean Manufacturing Specialist
- Sustainability Manager
- Process Improvement Specialist
- Data Analyst/Manager

ABET ACCREDITATION

The Industrial Engineering (Bachelor of Science) program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and the Industrial and Similarly Named Engineering Programs Program Criteria.

PROGRAM FACULTY MEMBERS

Faculty Members of the IE have PhDs from many nations. The variation supports and improves the Program's teaching and research activities. The IE Program has a sufficient number of qualified faculty members to handle all program curricular areas, including the core and elective courses.

Faculty Name	Position	Acad. Rank	Email
Dr. Majed Mohammed Masmali	Head of Depart.	Assist. Prof.	majed.masmali@nbu.edu.sa
Dr. Mouloud Mebarek Aoudia	Program Direct.	Assist. Prof.	mouloud.aoudia@nbu.edu.sa
Dr. Taycir Ridha Ben Abid	Female Section Coordinator	Assist. Prof.	taycir.benobiad@nbu.edu.sa
Dr. Ahmed Saad Eddine Souissi	Faculty Member	Assist. Prof.	ahmed.souissi@nbu.edu.sa
Dr. Amira Ammar Abbassi	Faculty Member	Assist. Prof.	amira.taktak@nbu.edu.sa
Dr. Aqeel Asaad Al-Salem	Faculty Member	Assist. Prof.	aqeel.alsalem@nbu.edu.sa
Dr. Jihen Abdulaziz Landolsi	Faculty Member	Assist. Prof.	jihene.landolsi@nbu.edu.sa
Dr. Mamdouh Ibrahim Elamy	Faculty Member	Assist. Prof.	mamdouh.morsi@nbu.edu.sa
Dr. Sharaf Awda Al-Sofyani	Faculty Member	Assist. Prof.	sofyani@nbu.edu.sa
Dr. Yehya Ibrahim Mesalam	Faculty Member	Assist. Prof.	yehya.mesalam@nbu.edu.sa
Dr. Mohamed Sassi Iftirich	Faculty Member	Lecturer	mohamed.ifririch@nbu.edu.sa
Eng. Ibrahim Abdullah Alzammam	Faculty Member	Lecturer	ibrahim.alzammam@nbu.edu.sa

ENROLLMENT AND GRADUATION DATA

The program enrollment and graduation data are provided for the last five and current years.

Academic year	Enrollment		Graduation	
	Male Section	Female Section	Male Section	Female Section
2018/2019	65	-	17	-
2019/2020	71	-	10	-
2020/2021	80	-	10	-
2021/2022	86	-	27	-
2022/2023	74	-	25	-
2023/2024	56	71	15	-
2024/2025	58	114	-	-

3. INDUSTRIAL ENGINEERING LABORATORIES

The Industrial Engineering Department is equipped with a comprehensive array of specialized laboratories that provide students with hands-on experience and practical knowledge in various aspects of industrial engineering. These labs are integral to bridging the gap between theoretical concepts and real-world applications, ensuring that students are well-prepared for successful careers in engineering and technology. The department's laboratories include the follwings.

WORK STUDY LABORATORY

Assembly Task Workstation for Time and Motion Study

Overview

The Work Study Laboratory is dedicated to the systematic analysis and optimization of work processes. It plays a crucial role in teaching students the principles of time and motion studies, which are essential for enhancing productivity and efficiency in industrial operations. Through hands-on experiments, students learn how to identify inefficiencies, streamline workflows, and eliminate waste in diverse industrial settings.

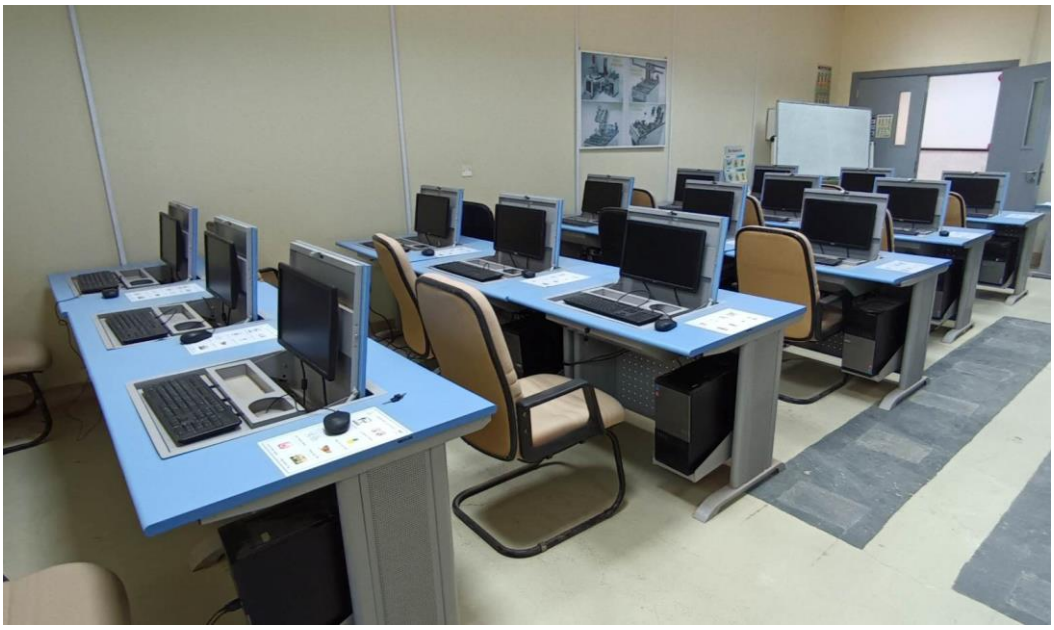
Key Features

- **Assembly Task Workstation:** This workstation is designed to simulate real-world assembly processes using tools such as wooden boards with bolts and nuts. Students conduct experiments to identify inefficiencies, develop process enhancements, and apply theoretical concepts to practical tasks.
- **Time and Motion Studies:** Students utilize tools like stopwatches and experiment sheets to perform detailed analyses of task sequences, identifying bottlenecks and optimizing workflows. They learn to document processes and measure time taken for different methods or conditions, which is critical for improving efficiency.
- **Predetermined Motion Time System (PMTS):** This setup employs tools like cylinders and disks to measure task durations, helping students establish standard times and streamline operations. The PMTS provides a foundation for evaluating work processes, identifying time-consuming activities, and optimizing productivity through methodical analysis.

Educational Value

Students develop critical skills in analyzing and optimizing work processes. They gain expertise in evaluating workflows, implementing improvements, and enhancing productivity. The lab emphasizes data-driven approaches and systematic evaluation, preparing students for industrial management roles where efficiency and resource optimization are paramount. By engaging in these activities, students learn to tackle real-world challenges and develop innovative solutions to improve industrial operations.

DEPARTMENT COMPUTER LABORATORY



Industrial Engineering Computer Lab

Overview

The Department Computer Laboratory serves as a hub for educational activities, providing essential computational resources for data analysis, simulation, and design projects. It supports teaching, research, and the practical application of industrial engineering principles, ensuring that students have access to the tools and technologies needed to succeed in their studies and future careers.

Key Features

- **Workstations:** The lab is equipped with desktop computers that support tasks such as simulation, modeling, data analysis, and computer-aided design (CAD/CAM). Each workstation provides access to industry-standard software tools, enabling students to develop technical proficiency and apply their knowledge to practical challenges.
- **Collaborative Environment:** The lab's design fosters teamwork and problem-solving skills through interactive discussions and group projects. The presence of posters and educational materials reinforces industrial engineering concepts and serves as visual aids to enhance learning and understanding.

Educational Value

Students develop crucial skills in data analysis, process optimization, and design, which are essential for industrial engineering. The lab supports research and project-based learning, encouraging innovation and collaboration. This environment prepares students for diverse roles in the industry, where computational proficiency is a key asset. By engaging in hands-on activities and working collaboratively, students gain the skills needed to analyze complex systems, optimize processes, and develop innovative solutions to real-world problems.

INDUSTRIAL ROBOTICS LABORATORY

Robotics and Automation Laboratory

Overview

The Industrial Robotics Laboratory specializes in robotic systems and automation technologies used in modern manufacturing. It provides hands-on experience with programming, operating, and integrating robotic systems, equipping students with the skills needed for careers in robotics and automation. The lab emphasizes the importance of robotics in enhancing productivity, precision, and efficiency in industrial processes.

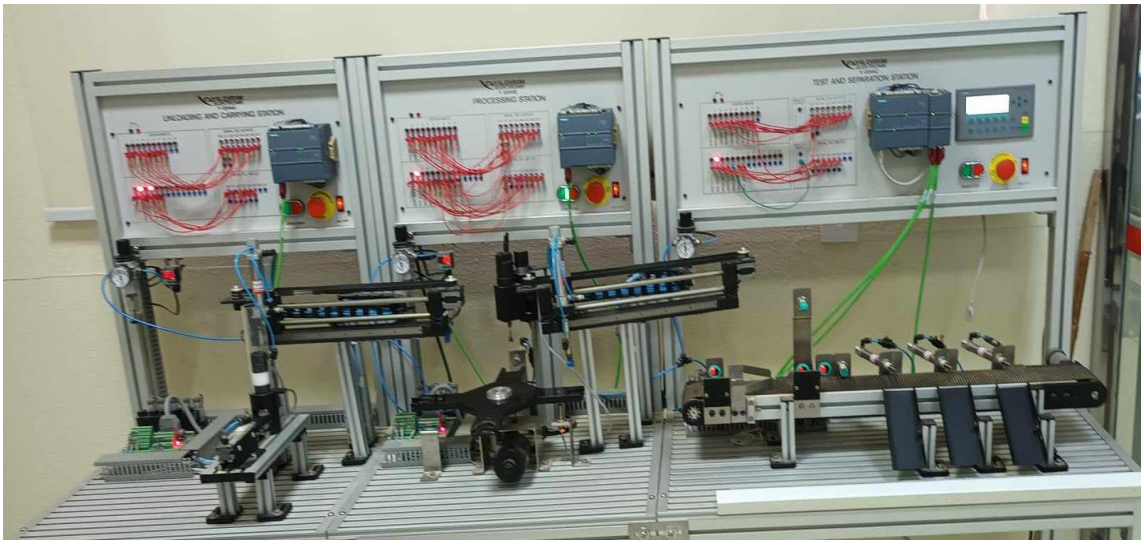
Key Features

- **Robotic Arms:** The lab includes various models such as the Yaskawa Motoman GP8 and SCARA robots, which are used for tasks like assembly, sorting, and pick-and-place operations. These setups allow students to explore robot kinematics, dynamics, and control, gaining practical experience in programming and operating robotic systems.
- **Conveyor Belt System:** Integrated into the lab setup, the conveyor belt system simulates real-world industrial scenarios, enabling students to explore material handling and automation processes. This setup helps students understand the integration of robotics with other manufacturing components, enhancing their ability to design and implement automated solutions.

Educational Value

Students learn about robot programming, sensor integration, and system design, developing solutions for industrial applications. The lab emphasizes the development of practical skills and knowledge in robotics, preparing students for careers where automation plays a pivotal role. By bridging the gap between theory and practice, the lab equips students with the skills needed to excel in the rapidly evolving field of robotics and automation. Students gain hands-on experience with state-of-the-art robotic technologies, enhancing their ability to design, program, and manage robotic systems in industrial settings.

INDUSTRIAL AUTOMATION LAB



PLC-Controlled Industrial Automation Training Stations

Overview

The Industrial Automation Lab provides students with practical experience in automation technologies, focusing on the use of PLCs, sensors, and actuators to control industrial processes. This lab is essential for understanding the complexities of automated systems and the principles of industrial control, preparing students for careers in manufacturing, engineering, and technology.

Key Features

- **PLC-Controlled Systems:** The lab teaches students to program and manage automated systems, including conveyor belts and robotic arms. This fosters skills in system integration and control, emphasizing the role of PLCs as the "brains" of automated systems. Students learn to create control algorithms, coordinate system components, and optimize process performance.
- **Sensors and Actuators:** Essential for real-time process control and optimization, these components enable students to apply theoretical knowledge in practical settings. Students learn how to gather and use data to make informed decisions about process management, enhancing their ability to design and implement automated solutions.

Educational Value

Students develop expertise in automation technologies, system integration, and process optimization, which are crucial for modern manufacturing and industrial automation. The lab bridges the gap between academic learning and real-world application, preparing students for technology-driven careers in industrial engineering. By working with state-of-the-art equipment, students gain valuable insights into the automation processes that drive industrial efficiency. The lab equips students with the skills needed to design, program, and manage complex automated systems, ensuring they are well-prepared for the challenges of modern industrial environments.

HUMAN FACTORS ENGINEERING LABORATORY

Vision and Audiology Testing Station

Overview

The Human Factors Engineering Laboratory focuses on ergonomics and human performance, studying how humans interact with their environments to enhance safety, productivity, and comfort. This lab is crucial for developing ergonomic solutions across various work settings, ensuring that human capabilities and limitations are considered in the design of tools, workspaces, and processes.

Key Features

- **Purdue Pegboard Dexterity Test:** This test measures dexterity and coordination, assessing both gross and fine motor skills essential for tasks requiring manual precision. It provides data on human capabilities that can inform ergonomic designs, helping students understand the importance of designing tasks and tools that align with human capabilities.
- **Anthropometric Tools:** The lab includes digital hand dynamometers, goniometers, and pinch gauges to evaluate physical capabilities such as grip strength and joint range of motion. These tools help design workspaces that minimize injury risks and maximize comfort, allowing students to explore how ergonomic principles can be applied to improve workplace safety and efficiency.

Educational Value

Students gain insights into ergonomic design and sensory performance, developing solutions to improve workplace safety and efficiency. The lab emphasizes the importance of accommodating human abilities and limitations, preparing students for roles in human factors engineering and related fields. By understanding human interactions with technology and environments, students can contribute to safer and more efficient workspaces. The lab equips students with the knowledge and skills needed to design ergonomic solutions that enhance human performance and well-being in various work settings.

COMPUTER INTEGRATED MANUFACTURING (CIM) LAB

Festo MPS 500 system

Overview

The Computer Integrated Manufacturing (CIM) Lab immerses students in modern manufacturing processes, combining robotics, automation, and computer control to replicate industrial environments. It provides hands-on experience with cutting-edge technologies, allowing students to explore the integration of various manufacturing components and understand the complexities of advanced manufacturing systems.

Key Features

- **Festo MPS 500 System:** Central to the lab, this system includes stations for various manufacturing tasks, such as distribution, processing, handling, storage, sorting, and testing. It illustrates the integration of flexible manufacturing systems, allowing students to explore how different components work together in a cohesive production process.
- **CNC Machines:** These machines enable students to practice machining operations, gaining proficiency in precision manufacturing techniques and learning the fundamentals of computer numerical control (CNC) programming. Students learn to set up workpieces, execute CNC programs, and perform machining operations, providing insights into precision manufacturing.

Educational Value

Students learn about the integration of robotics and automation in manufacturing, preparing them for careers in industrial engineering. The lab supports experiments in flexible manufacturing, robotics programming, and vision system applications, enhancing their technical skills and problem-solving abilities. By experiencing the complete manufacturing cycle, students are better prepared for roles in advanced manufacturing and process optimization. The lab fosters an understanding of how to integrate different manufacturing technologies to create efficient, automated production systems.

4. ORGANIZATIONAL STRUCTURE OF THE INDUSTRIAL ENGINEERING DEPARTMENT

The following chart and accompanying descriptions outline the organizational structure of the Industrial Engineering Department.

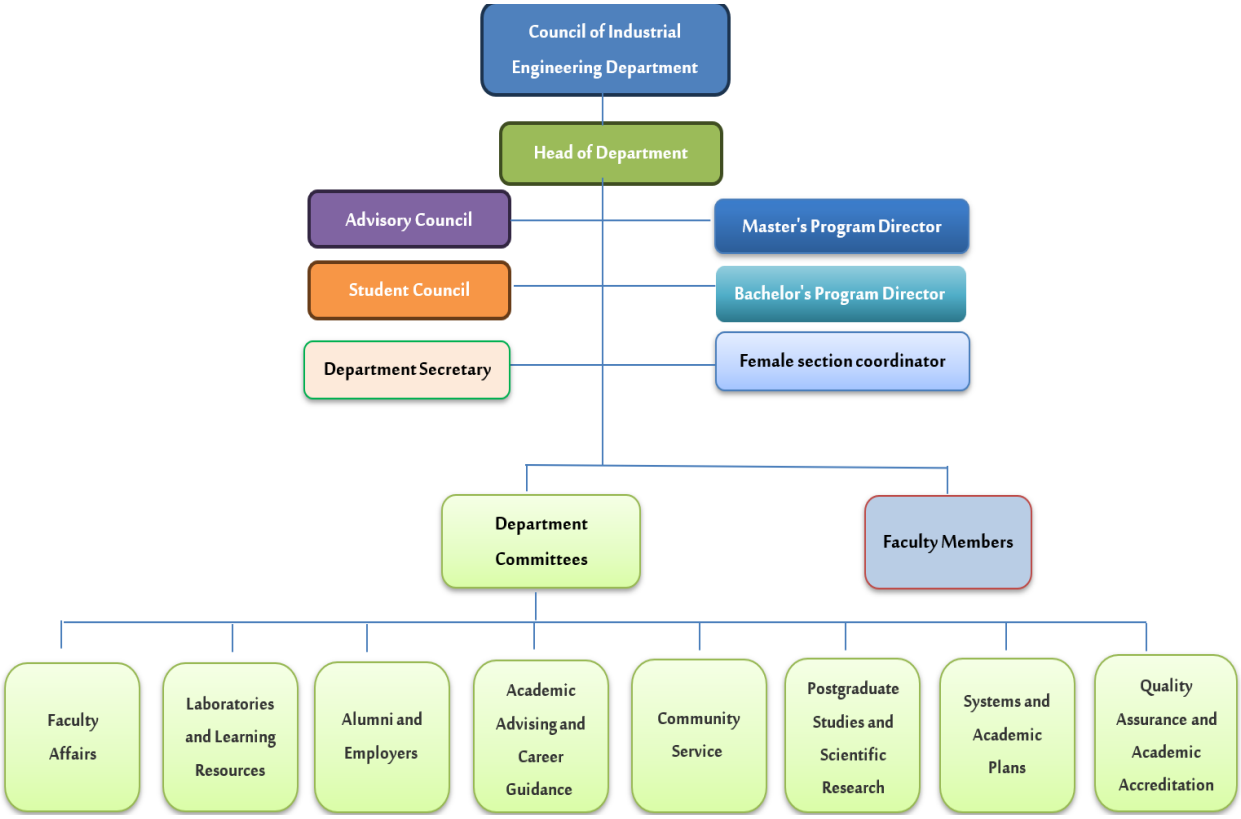


Figure 1 - Organizational Chart of the Industrial Engineering Department

COUNCIL OF INDUSTRIAL ENGINEERING DEPARTMENT

The Council of Industrial Engineering Department is the primary decision-making body responsible for overseeing all academic, research, administrative, financial, and community-related affairs within the department. It ensures that the department aligns with the strategic goals and vision of the university.

HEAD OF DEPARTMENT (HOD)

The Head of Department leads the Industrial Engineering Department, implementing the university's vision and strategic goals. The HoD chairs the department council, supervises academic and administrative activities, oversees quality assurance, and manages the department's resources and development initiatives.

ADVISORY COUNCIL

The Advisory Council provides strategic advice and guidance to the Industrial Engineering Department. Comprising experienced professionals and academics, it ensures that the department stays updated with industry trends, best practices, and innovative teaching and research methodologies.

STUDENT COUNCIL

The Student Council represents the interests of the student body within the Industrial Engineering Department. It facilitates communication between students and faculty, organizes student activities, and ensures that student concerns and suggestions are addressed.

DEPARTMENT SECRETARY

The Department Secretary provides essential administrative support to the department council and other departmental functions. This role involves organizing meetings, preparing agendas, recording minutes, and ensuring that council decisions are implemented effectively.

MASTER'S PROGRAM DIRECTOR

The Master's Program Director oversees the Master's program in Safety Engineering and Risk Management. The director is responsible for curriculum development, program assessment, faculty coordination, and providing support and guidance to graduate students to ensure academic excellence and program coherence.

BACHELOR'S PROGRAM DIRECTOR

The Bachelor's Program Director manages the Bachelor of Industrial Engineering program. This role includes overseeing curriculum development, ensuring program quality, coordinating faculty efforts, and supporting undergraduate students throughout their academic journey.

FEMALE SECTION COORDINATOR

The Female Section Coordinator is responsible for coordinating academic and administrative tasks in the female section of the department. This includes implementing the department's operational plan, ensuring quality standards, and managing resources and support services specific to the female section.

FACULTY MEMBERS

Faculty Members are responsible for delivering high-quality education, conducting research, and engaging in community service. They play a crucial role in curriculum development, student mentoring, and maintaining the academic standards of the department.

DEPARTMENT COMMITTEES

Various Department Committees manage specific functions within the department to ensure structured and efficient operations, supporting the accomplishment of the department's mission and goals. Key committees include:

1. **Quality Assurance and Academic Accreditation Committee**

- **Purpose**: Ensure high-quality education and compliance with accreditation standards.
- **Key Responsibilities:**
  - Develop, implement, and monitor a comprehensive quality assurance system.
  - Promote a culture of quality among faculty, staff, and students.
  - Coordinate academic accreditation processes, including self-study preparation and site visits.
  - Oversee curriculum assessment and evaluation.
  - Conduct periodic quality assessments and evaluations.
  - Identify and facilitate training needs for faculty and staff.
  - Collect and analyze data on program performance indicators and stakeholder surveys.
  - Collaborate with stakeholders to enhance quality and communicate outcomes.
  - Design the Annual Operational Plan and monitor its implementation.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

2. **Faculty Affairs Committee**

- **Purpose**: Manage faculty-related matters and support professional development.
- **Key Responsibilities:**
  - Oversee faculty recruitment, hiring, onboarding, promotions, and evaluations.
  - Handle faculty transfers, assignments, leaves, and workload allocation.
  - Facilitate professional development opportunities and mentorship programs.
  - Consider faculty promotion requests and submit recommendations to the department council.
  - Manage scholarship applications and track recipients' progress.
  - Review scholarship requests and ensure compatibility with department policies.
  - Maintain faculty data and analyze staffing needs.
  - Follow up on scholarship recipients' progress and submit reports to the department council.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

3. **Laboratories and Learning Resources Committee**

- **Purpose**: Manage and optimize laboratory facilities and learning resources.
- **Key Responsibilities:**
  - Oversee lab maintenance, safety protocols, and equipment upgrades.
  - Coordinate the procurement and inventory of lab supplies and equipment.
  - Prepare an annual report on laboratory usage, maintenance, and resource needs.
  - Ensure the availability and functionality of learning resources, including software, textbooks, and online materials.
  - Provide technical support and training on resource utilization.
  - Facilitate training sessions and workshops on using learning resources.
  - Evaluate resource needs and recommend improvements.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

4. **Alumni and Employer Relations Committee**

- **Purpose**: Foster strong relationships with alumni and employers for mutual benefit.
- **Key Responsibilities:**
  - Maintain an updated database of alumni contact information and career trajectories.
  - Organize alumni events, reunions, and networking opportunities.
  - Engage with employers to identify internship and job opportunities.
  - Collect feedback from alumni and employers to improve the program.
  - Create a database of training and employment opportunities.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

5. **Academic Advising, Career Guidance and Student Affairs Committee**

- **Purpose**: Provide comprehensive academic and career support to students.
- **Key Responsibilities:**
  - Offer personalized academic advising, course selection guidance, and progress monitoring.
  - Assist with career planning, resume reviews, and mock interviews.
  - Organize onboarding programs and workshops.
  - Connect students with mentors and internship/job opportunities.
  - Recognize and encourage high-achieving students through mentorship and advanced learning opportunities.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

6. **Community Service Committee**

- **Purpose**: Promote community engagement and social responsibility.
- **Key Responsibilities:**
  - Develop and implement community service initiatives aligned with the department's mission.
  - Encourage faculty and student participation in community engagement activities.
  - Build partnerships with community organizations.
  - Organize events to promote community service and assess their impact.

- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

7. Graduate Studies and Scientific Research Committee

- **Purpose**: Oversee graduate programs and foster research excellence.
- **Key Responsibilities:**
  - Oversee all aspects of graduate programs, including admissions, curriculum development, and evaluation.
  - Support and mentor graduate students in their research and studies.
  - Manage the thesis/dissertation processes.
  - Promote research activities, collaboration, and funding opportunities.
  - Organize research seminars, workshops, and conferences.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

8. Curriculum and Study Plan Committee

- **Purpose**: Design, develop, and update the curriculum.
- **Key Responsibilities:**
  - Create and revise study plans for academic programs.
  - Review and evaluate the curriculum to ensure it aligns with industry trends, complies with academic standards, addresses stakeholders' needs, and incorporates innovative practices.
  - Collaborate with stakeholders to improve curriculum effectiveness.
  - Periodically review and evaluate department programs and curricula.
  - Propose revisions based on feedback and assessment results.
- **Other Responsibilities:**
  - Complete tasks assigned by the department council or head of the department.

5. ADMISSION TO THE INDUSTRIAL ENGINEERING PROGRAM

ADMISSION TO NORTHERN BORDER UNIVERSITY

An applicant for admission to the University must satisfy the following conditions:

- The student must be of Saudi nationality, or the son of a Saudi mother, or the wife of a Saudi citizen who has children from him.
- The student must have a record of good conduct and behavior.
- The student must have obtained a high school diploma or its equivalent from within or outside the Kingdom.
- The student must obtain approval from their employer if they are employed by any government agency.
- The student must not be enrolled in any other university.
- The student must be medically fit.
- The student must pass any test or personal interview determined by the University Council.
- The student must not have been previously dismissed from Northern Border University or any other university for academic or disciplinary reasons.
- If the applicant has obtained their high school certificate from outside the Kingdom, their certificates must be attested by the Saudi Cultural Attaché in the country of graduation or equivalency certified by the Ministry of Education.
- An applicant who obtained their secondary education outside Saudi Arabia is subject to the general and specific admission requirements applied to their peers who graduated from inside Saudi Arabia.

The Deanship of Admission and Registration annually establishes the admission requirements and regulations, as well as the number of students that can be admitted in each academic year, based on the proposal of the colleges and in accordance with the capabilities of the academic programs, reports of the relevant authorities, national development requirements, and supply and demand indicators in the job market.

The selection of applicants for admission is based on the weighted score, calculated as follows (Science Track students):

Weighted Score = 0.30*THANAWIA + 0.30*QUDRAT + 0.40*TAHSEEL

Where:

- THANAWIA: Percentage of Secondary School Certificate
- QUDRAT: Score of General Aptitude Test
- TAHSEEL: Score of Achievement Test

ADMISSION PROCESS TO THE ENGINEERING PROGRAMS

- Admission is competitive and based on available resources. The College of Engineering (CoE) Council projects the number of students, and the University Council (UC) finalizes the number to be admitted.
- The UC notifies the Deanship of Admission and Registration (DAR) once the student intake is decided.
- The DAR ranks and selects students based on a weighted score, granting preliminary admission to a limited number of students.
- **Final Admission Requirements:**
  - **For students enrolling from 2024/2025 onwards:** Complete 24 Credit Hours of the Scientific Track in the first year, with a minimum CGPA of 3.00 out of 5.
  - **For students enrolled before 2024/2025:** Complete 25 Credit Hours of the Scientific Track in the Preparatory Year within three semesters, with a minimum CGPA of 3.00 out of 5, and at least a grade of C in all English courses.
- The DAR sends the list of accepted students to the CoE.

ENGINEERING PROGRAM SPECIALIZATION:

Starting in the 2024/2025 academic year, the College of Engineering at Northern Border University is implementing changes to its curriculum structure and admission process. Previously, students completed a separate preparatory year, followed by two common trimesters (or one semester) for all programs, before specializing in their chosen discipline.

However, from the 2023/2024 academic year onwards, the preparatory year is integrated into the curriculum as a common first year for all programs.

The integrated first year, which replaces the separate preparatory year, is designed to equip students with the fundamental skills necessary for success in the Engineering and Scientific programs. It focuses on developing proficiency in English, essential mathematical concepts (Calculus 1 and 2), and key university skills (Digital Culture and University Skills). This revised approach ensures that students are well-prepared to tackle the specialized coursework in the subsequent years of their chosen program.

To progress to their specialized program after the first year, students must:

- For students enrolling from 2024/2025 onwards, specialization in engineering programs occurs after meeting the final admission criteria of the first common year.
- For students enrolled before 2024/2025, specialization occurs after completing a common semester with at least 13 credit hours.
- Students submit a Specialization Preferences Form based on their CGPA and available program capacity.
- The CoE finalizes and approves the list of specialized students, which is then communicated to the respective programs.

The College Guidance Committee informs students about the specialization process towards the end of the first year. Students then submit a specialization request form, indicating their program preferences. Allocation to specific programs is based on student preferences, GPA, and program capacities.

6. ADVISING AND CAREER GUIDANCE AT THE INDUSTRIAL ENGINEERING PROGRAM

The Industrial Engineering Program is committed to providing a holistic advising and career guidance program integral to helping students make well-informed decisions about their academic path and future careers. This support system is initiated from the moment students join the College of Engineering and is sustained throughout their academic journey.

BEFORE JOINING PROGRAMS

When students first join the college, they are assigned an academic advisor who will provide them with guidance and support throughout their studies. The advisor will help students understand the college's academic requirements, select the right courses, and develop a plan to graduate on time. The advisor will also be available to answer any questions that students may have about the college or their academic programs.

In addition to meeting with their advisor, students are also encouraged to attend the college's orientation program. The orientation program provides students with valuable information about the college, including its academic programs, resources, and expectations. Students will also have the opportunity to meet with faculty members and learn more about their specific areas of interest.

AFTER JOINING THE INDUSTRIAL ENGINEERING PROGRAM

Upon enrollment in the Industrial Engineering Program, students are paired with an academic advisor who is well-versed in the nuances of the program's requirements. This advisor will consistently offer direction and assistance, enabling students to make knowledgeable decisions regarding their academic trajectory and future careers. Additionally, the advisor will monitor the students' academic progression, providing timely assistance should they encounter any obstacles along their educational journey.

In addition to meeting with their advisor, students are also encouraged to take advantage of the program's career guidance structure. The program offers a variety of career counseling services, including individual counseling, workshops, and online resources. These services can help students explore different career options, develop their resumes, and prepare for job interviews.

The Industrial Engineering Program's advising and career guidance initiatives are designed to help students reach their full potential. By providing students with the resources and support they need, the program is committed to helping students succeed in their academic and professional careers.

CONTACTING ADVISORS

As students in the Industrial Engineering Program, if there are any questions about academic programs, career prospects, or any other concerns, advisors can be reached for assistance. Advisors are available during scheduled office hours or by appointment, and they can also be contacted through email or phone.

Following are some methods to establish contact with the advisors:

- **Office hours**: Advisor's office hours are posted on their office doors or in the course syllabus.
- **By appointment**: If students cannot meet with advisors during the office hours, they can schedule an appointment by emailing the advisor or calling their office number.
- **By email or phone**: For quick queries, students can email or call their advisor. The advisor's email address and phone number are listed on the program website.

The Industrial Engineering Program demonstrates an unwavering commitment to students' academic and professional growth through its robust academic advising and career guidance programs. With a focus on personalized support, the dedicated team of advisors works diligently to assist students in navigating their academic journey and making informed decisions about their future careers.

MECHANISMS OF ACADEMIC GUIDANCE

The structured approach to academic guidance involves a variety of mechanisms designed to address the diverse needs of the student body. These mechanisms include regular counseling sessions where students can discuss their progress and challenges, workshops and seminars focused on essential skills and career planning, and mentorship programs that offer personalized guidance. Access to extensive academic resources and tools is provided, tailored academic plans are developed for each student, and continuous monitoring and evaluation of academic performance ensures ongoing improvement. Additionally, targeted support for struggling students is offered, and the potential of outstanding students is recognized and

nurtured through advanced learning opportunities. These integrated mechanisms collectively create a supportive and empowering environment that fosters student growth and achievement.

DETAILED MECHANISMS

- **Regular Counseling Sessions**:
  - Scheduled meetings between students and academic advisors to discuss academic progress, personal challenges, and future goals.
  - These sessions provide a platform for students to voice their concerns and seek guidance on various issues.
- **Workshops and Seminars**:
  - Organized sessions on topics such as study skills, time management, career planning, and personal development.
  - These workshops aim to equip students with the necessary skills and knowledge to succeed academically and personally.
- **Mentorship Programs**:
  - Pairing students with mentors who can provide personalized guidance and support.
  - Mentors help students navigate academic challenges, set goals, and develop a clear path for their future.
- **Academic Resources and Tools**:
  - Providing students with access to academic resources such as libraries, online databases, study guides, and tutoring services.
  - Ensuring that students have the necessary tools to complete their coursework and enhance their learning experience.
- **Personalized Academic Plans**:
  - Developing tailored academic plans that address the unique needs and goals of each student.
  - These plans include specific strategies for academic improvement, goal setting, and tracking progress.

- **Monitoring and Evaluation**:
    - Regular assessment of students' academic performance and progress.
    - Implementing feedback mechanisms to continuously improve the academic guidance process.
- **Support for Struggling Students**:
    - Identifying students who are at risk of academic failure and providing targeted interventions.
    - Offering additional counseling, tutoring, and resources to help these students improve their academic standing.
- **Recognition and Support for Outstanding Students**:
    - Acknowledging and rewarding academic excellence.
    - Providing advanced learning opportunities and support for high-achieving students to further their academic and personal growth.

These mechanisms ensure that students receive comprehensive support throughout their academic journey, enabling them to achieve their full potential and successfully navigate their educational experience.

7. ACADEMIC REGULATIONS

DEFINITIONS

- **Academic Term:** A period of no less than fifteen weeks in a two-term system, or no less than twelve weeks in a three-term system, not including the registration and final examination periods.

Academic Term is a period that typically lasts for 15 weeks in a two-term system, or 12 weeks in a three-term system. It is the basic unit of time for academic planning and scheduling.

- **Summer Term:** A period of no less than eight weeks in a two-term system, or no less than six weeks in a three-term system. The weekly duration of each course in a summer term is twice its duration during the regular academic term.

Summer Term is a shorter academic term that is typically offered during the summer months. It is a good option for students who want to accelerate their studies or make up for missed coursework.

- **Study Plan:** A collection of obligatory, elective, and free courses, the total credit units of which constitute the graduation requirements that the student must successfully complete to obtain the academic degree in the specified specialization.

A Study Plan is a document that outlines the courses that a student must complete in order to graduate from a university. It typically includes a list of required courses, as well as elective and free courses that the student can select.

- **Course:** An academic subject included in the Study Plan of each program. It is identified by a number, code, title, and detailed description of its content. Each course is subject to follow-up, evaluation, update and development within each department. It may be taught independently or have prerequisite or co-requisite requirements.

A course refers to a unit of academic instruction that typically requires a certain number of contact hours per week. Courses can be taught in a variety of formats, including face-to-face, online, or blended.

- **Credit Hour:** each of the weekly lectures, with a duration not less than fifty (50) minutes or a laboratory session or field study of not less than 100 minutes' duration.

Credit Hour is a unit of measurement that is used to track the amount of time that a student spends in class. One academic unit typically corresponds to 50 minutes of lecture time, or 100 minutes of laboratory time.

- **Academic Probation:** a notification given to a student with a cumulative GPA below the minimum acceptable limit as explained in this handbook.

Academic Probation is a formal notification issued to a student when his cumulative Grade Point Average (GPA) falls below the minimum acceptable limit set by the university, as outlined in this handbook. The purpose of an Academic Probation is to alert the student that his academic performance is not meeting the satisfactory standards set by the university. It serves as a means of intervention to help the student recognize the need for improvement and take appropriate action to enhance his academic standing. Receiving an Academic Probation does not typically result in immediate consequences, such as academic dismissal from the university. This is generally true for the first and second probationary periods. However, it is important to note that if a student is placed on probation for a third time, it may lead to more severe consequences, including academic dismissal from the university.

- **Teaching Methods:** Various approaches used for instruction, including face-to-face instruction, blended learning, distance learning, self-learning, and other teaching methods.

These are the different ways that courses are taught. Some common teaching methods include face-to-face instruction, online learning, and blended learning.

- **Class Work Score:** the score which reflects the student's standing during a term according to his performance in examinations, research, and other academic activities related to a particular course.

The Class Work Score typically refers to the evaluation or assessment of a student's performance in his regular class activities, assignments, and participation throughout the course. It is a measure of how well a student has engaged with the material, completed assignments, participated in discussions, and demonstrated his understanding of the subject

matter during regular class sessions. The class work score contributes to the overall grade or evaluation of the student's performance in the course.

- **Final Examination:** an examination in course materials, given once at the end of every term.

Final Examination is typically given at the end of a course. It is a major component of the final score for the course.

- **Final Examination Score:** the score attained by a student in the final examination for each course.

The Final Examination Score refers to the score a student receives on his final examination for a particular course. The final examination is usually designed to assess the student's comprehensive understanding of the subject matter covered throughout the term. The final examination score often carries significant weight in determining the student's final grade for the course.

- **Final Score:** the total sum of the class work score plus the final examination score for each course out of a total grade of 100.

The Final Score refers to the cumulative score that a student receives for a course. It takes into account various components such as class work, assignments, quizzes, tests, projects, and the final examination. The final score represents the student's overall performance and achievement in the course, providing a comprehensive evaluation of his understanding and mastery of the subject matter.

- **Transcript:** An official document that includes all the courses a student has taken at the University as of the date of its printing. It indicates course codes, numbers and credit hours, the grades earned by the student, term GPA, and cumulative GPA. In addition, it includes the list of courses and credits transferred, if any.

A transcript is an official document provided by a university that contains a comprehensive record of a student's academic history up to the date of its issuance. It includes detailed information about the courses the student has taken during his time at the university. The transcript typically includes essential details such as course title, course code, and the number of credit hours associated with each course. It also displays the grades earned by the student in

each course. The transcript includes both letter grades and numerical grade point equivalents. Additionally, the transcript provides information about the student's term GPA for each term and his cumulative GPA, which represents his overall average performance throughout his academic career at the university. In some cases, the transcript may also include a section that lists courses and credits transferred from other educational institutions, if the student has completed coursework elsewhere and had it recognized or accepted for credit at the current university.

- **Visiting Student:** A student who studies some courses at another university or branch of the university without transferring.

Visiting Student is a student who is enrolled in a course at another university or branch of the university. He is not officially enrolled in the university, but he is allowed to take courses there.

- **Grade:** a percentage, or alphabetical letter, assigned indicating the final grade obtained by a student in a course.

A Grade refers to a numerical or alphabetical representation of a student's academic performance or achievement in a course. Grades range from A+ to F. Each grade corresponds to a specific level of achievement, with A representing excellent performance, and F indicating a failing grade.

- **Incomplete Grade:** a provisional grade assigned to each course in which a student fails to complete the requirements by the required date. This is indicated in the transcript by the letter grade (IC).

Incomplete Grade is given to a student who is unable to complete the requirements for a course within the specified period.

- **In Progress Grade:** a provisional grade assigned to each course which requires more than one term to complete. This is indicated in the transcript by the letter grade (IP).

In Progress Grade is a grade that is given to a course that is still in progress.

- **Term GPA:** A: the total quality points a student has earned, divided by the credit hours assigned for all courses taken in a given term. Total quality points are calculated by multiplying the credit hours by the grade point in each course.

Term GPA is the grade point average that a student receives for a term. It is calculated by dividing the total quality points that the student earns by the total of credit hours for all courses taken in that term.

- **Cumulative GPA:** the total quality points a student has earned in all the courses taken since enrolling at the University, divided by the total number of credit hours assigned for these courses.

Cumulative GPA is the cumulative grade point average that a student receives for all of the courses that he had taken since he started at the university. It is calculated by dividing the total quality points that a student earns by the total of credit hours for all courses taken in the university.

Example of the Calculation of term GPA and Cumulative GPA

First term

Course	Credit Hours	%	Grade Code	Grade Point	Quality Points
Course #1	2	85	B+	4.50	9.00
Course #2	3	70	C	3.00	9.00
Course #3	3	92	A	4.75	14.25
Course #4	4	80	B	4.00	16.00
TOTAL	12				48.25

$$\text{First term GPA} = \frac{\text{Total quality points (48.25)}}{\text{Total credits (12)}} = 4.02$$

Second term

Course	Credit Hours	%	Grade Code	Grade Point	Quality Points
Course #5	2	96	A+	5.00	10
Course #6	3	83	B	4.00	12
Course #7	4	71	C	3.00	12
Course #8	3	81	B	4.00	12
TOTAL	12				46

$$\text{Second term GPA} = \frac{\text{Total quality points (46)}}{\text{Total credits (12)}} = 3.83$$

$$\text{Cumulative GPA} = \frac{\text{Total quality points (48.25+46)}}{\text{Total credits (12+12)}} = 3.93$$

- **General Grade:** the assessment of a student's scholastic achievement during his study at the University.

General Grade is a description of the overall academic achievement of a student during his study period at the university.

- **Course Load:** the total number of credit hours a student can register in a term where the minimum and maximum load is determined by the University executive regulations.

Course Load is the number of credit hours that a student is taking in a term. The course load is typically limited by the university to ensure that students do not overload themselves.

- **Enrollment termination:** The act of suspending a student from continuing his studies by withdrawal, interruption or dismissal for reasons stipulated in the academic regulations and policies of the university.

Enrollment termination refers to the process of ending a student's enrollment or registration at the university. It is the act of officially discontinuing a student's active participation in his academic program or courses. Enrollment termination can occur for various reasons, such as voluntary withdrawal, failure to meet academic requirements, disciplinary reasons, or other circumstances outlined in the university's regulations and policies. When enrollment termination takes place, the student is no longer able to attend classes, access academic resources, or receive the benefits and privileges associated with being an enrolled student.

- **Academic dismissal:** The termination of a student's enrollment from his studies as a result of receiving a specified number of academic probations or for exceeding the maximum regular study period, or for both reasons.

Academic dismissal is typically reserved for students who have failed to meet the academic requirements of the university, such as failing to maintain a minimum GPA, exceeding the maximum number of allowed withdrawals, or for exceeding the maximum regular study period.

- **Disciplinary dismissal:** The termination of a student's enrollment from his studies due to the issuance of a disciplinary decision against him by the competent authority in accordance with the rules of student behavior and discipline at the University.

Disciplinary dismissal refers to the termination of a student's enrollment or studies due to severe disciplinary infractions or violations of the institution's code of conduct. It would typically involve actions that are significantly disruptive, harmful, or contrary to the values and policies of the institution.

- **Withdrawal:** refers to the voluntary action taken by a student to officially discontinue his enrollment or registration in the university before completing the intended program or course of study.

When a student withdraws, he is no longer considered actively enrolled in the course or program, and he will lose privileges associated with being a registered student, such as access to campus resources or participation in academic activities. Students may choose to withdraw for various reasons, such as personal circumstances, health issues, financial concerns, or a change in academic or career plans. The process of withdrawal typically involves completing the necessary paperwork or online procedures provided by the university to officially notify them of the decision to withdraw. It is important for students to be aware of the specific deadlines, policies, and procedures related to withdrawal at the university. This ensures that the withdrawal is processed correctly, and the student's academic record reflects his decision to withdraw.

It is important to note that the term “withdrawal” is commonly used to formally indicate a student's decision to either drop all courses for a given term or to drop only one course within that term. In this context, the terms “apologizing” or “dropping” may also be used interchangeably to denote the action of withdrawing from a specific course or a set of courses, or even from an entire term.

- **Typical Study Plan:** It is the distribution of the requirements of an academic program plan on terms.

A typical Study Plan is a document that outlines the requirements for completing the study of an academic program at the university. It specifies the courses that must be taken, the number of credit hours required, and the order in which the courses should be taken.

- **Regular study period:** The specified period to complete the graduation requirements for an academic program according to the number of academic terms specified in the guideline plan for that program.

Regular study period is the amount of time that a student is expected to take to complete his academic program. The regular study period is typically determined by the number of academic terms specified in the guideline plan for the program.

- **Prerequisite:** A condition that must be met before being able to register for a course, and may include the student's success in a course or a number of courses, or a certain number of credit hours.

A prerequisite is a course that must be completed before taking another course. Prerequisites are typically put in place to ensure that students have the necessary knowledge and skills to succeed in the subsequent course.

- **Equivalence:** A process by which a student is considered to have passed a course within his academic study plan that he has not previously passed, if he has successfully completed another course that is equivalent or similar to the required course in his study plan. This process is governed by the regulations of the university.

Equivalence is the process of determining that two courses have similar content and learning outcomes. It allows students to transfer credits between institutions or colleges within the same university. Equivalence can also waive certain admission requirements for a program.

REGISTRATION

This table illustrates the maximum course loads (number of credit hours) that students are permitted to register based on their GPA in both the two-term system and the three-term system:

GPA	Maximum Course load (Two-Term System)	Maximum Course load (Three-Term System)
Below 2.00	14 credits	10 credits
2.00 to 2.74	16 credits	10 credits
Above 2.74	18 credits	12 credits

Students expected to graduate must adhere to the following credit hour limits:

- Standard Limit: Maximum 22 credit hours per two-term system.
- Exception: Students with a cumulative GPA of 4.00 or higher may enroll in up to 24 credit hours.

ATTENDANCE

- A regular student should attend all classes and laboratory sessions, whether in-person or virtual, according to the specified teaching methods in the curriculum. A student may be discontinued from a course and denied entrance to the final examination if his attendance is less than 75% of classes and lab sessions assigned to each course during the term, without a valid excuse. A student who is denied entrance to the examination due to excessive absences will be considered as having failed that course with a DN grade.
- The college council, or the authorized body to which it delegates its authority, holds the discretion to exempt a student from being denied entrance to the final examination and allow him to attend, provided he presents an acceptable excuse to the council. In cases where the college council grants such an exemption, the minimum attendance requirement is set at no less than 50% of the scheduled lecture and laboratory sessions for the course. This requirement is based on the total contact hours, whether conducted in-person or virtually, or through other specified teaching methods as outlined in the curriculum.
-

WITHDRAWAL (APOLOGIZING / DROPPING)

1. A student may be allowed to withdraw for a term and not be considered as having failed the courses if he furnishes an acceptable excuse to the authorized body as determined by the University Council, during the period specified in the academic calendar.
2. The period of interruption of study is counted towards the period required to complete graduation requirements, and the student's monthly allowance will be suspended during this period.
3. A student is not allowed to withdraw for more than three terms in the two-term system and five terms in the three-term system during his entire course of study at the university.
4. Withdrawal requests will not be accepted after the withdrawal period has ended.
5. Withdrawal from studying during the summer term does not count as one of the times a student is allowed to withdraw from studying in a regular term.
6. A student may withdraw from a course or a number of courses during the withdrawal periods specified in the academic calendar without being considered as having failed.
7. The remaining credit hours after withdrawing from a course or a number of courses should not be less than the minimum limit specified in the University's executive rules of the Study and Examination Regulations.
8. Students who exceed an absenteeism rate of 25% without an acceptable excuse starting from the beginning of the term will be denied entrance to the final examination and will not be allowed to withdraw in that term.
9. The student will be given a (W) grade for the course or courses from which he withdrew.

POSTPONEMENT

1. A student may apply for a study postponement for a term during the postponement periods specified in the academic calendar.
2. The postponement period is not counted in the regular duration required for completion of program degree.
3. A student is allowed to postpone his studies for a maximum of three terms in the two-term system or five terms in the three-term system.

4. Postponement requests will not be accepted after the postponement period has ended.
5. A student who accompanies a family member outside the country is eligible for a maximum postponement period of two years. The accompanying student must provide supporting evidence of his companionship when submitting the request at the beginning of each term. However, if the two-year period as a companion is surpassed, the accompanying student will be considered as having discontinued his studies and may apply as a new student to the university.

ENROLLMENT TERMINATION

1. A regular student who does not register for a term without submitting a postponement or withdrawal application will be considered to have interrupted his studies and will be dismissed from the university.
2. The student's enrollment will be terminated by the university in the following cases:
    - A student for whom two years have passed since he interrupted his studies.
    - A student who has exhausted all opportunities to raise his CGPA after a number of academic probations.
    - A student who has not completed the program requirements within the maximum period specified by the university's regulations.
    - A student who has been expelled from the university for disciplinary reasons more than once.
3. A student will be dismissed from the University if he receives a maximum of three consecutive academic probations for having a cumulative GPA lower than 2.00 out of 5.00. Based on the recommendations of the College Council, the University Council may grant a fourth chance to a student who can improve his cumulative GPA, within a period not more than one academic year.
4. A student who has been dismissed from the university due to receiving academic probations may apply to the respective department and college council to be granted a fourth opportunity to improve his Cumulative GPA. The university council, considering the recommendations of the college council and the Permanent Committee for Admission and Registration under the university's Vice Presidency for Academic Affairs, has the authority to provide the student with this fourth chance to enhance his Cumulative GPA.

5. A student will be dismissed from the University if he fails to complete the graduation requirements within a maximum additional period, equal to one-half of the period determined for his graduation in the original program period. The University Council considering the recommendations of the college council may make an exception and give the student the opportunity to complete his studies within an additional period not more than one academic year, provided that he was not dismissed due to a low cumulative GPA or Interrupting studies.
6. The summer term is not considered for issuing probation to students with a low cumulative GPA.

RE-ENROLLMENT

1. The re-enrollment process may apply in the following cases:
    - Interrupting studies.
    - Withdrawal from the university.
    - Academic dismissal.
    - Disciplinary dismissal.
2. A student whose enrollment has been terminated by the university may apply as a new student, without considering his previous academic record, provided he meets all the admission requirements specified at that time. The university council has the authority to make exceptions to this rule.
3. The application for re-enrollment applies to all cases according to the academic calendar.
4. The Permanent Admission and Registration Committee, under the university's Vice-Presidency for Academic Affairs, is responsible for evaluating the possibility of re-enrolling students.
5. The approval of a student's re-enrollment is subject to the decision of the university council.
6. A student who has been dismissed for disciplinary reasons may apply for re-enrollment to his original academic program using the same university ID number he had before the cancellation of his enrollment, provided that:
    a) three years have passed since the dismissal decision,
    b) the academic program is still offered by the university,

c) the student has successfully completed more than 50% of the required credit hours for his specialization.

d) If the conditions mentioned in (a), (b) and (c) are not met, the student may apply as a new student, subject to the admission requirements announced at that time.

7. A student who withdraws from the university during the registration period, before confirming enrollment or registering for courses, can re-enroll without any restrictions.
8. A student who withdraws from the university after confirming enrollment and registering for courses can re-enroll within two academic years. If more than two academic years have passed, he must apply as a new student.
9. A student who withdraws from the university after a period of study, without being on academic probation, can re-enroll within two academic years from the date of withdrawal from the university. The credits he earned for coursework completed prior to the withdrawal from the university will be counted.
10. A student can only withdraw from the university once.

TRANSFER FROM OUTSIDE THE UNIVERSITY

A student may transfer from outside the university after obtaining the approval of the Dean of Admission and Registration and the Dean of the college he intends to transfer to, under the following conditions:

1. The student must have studied at a local university or college, or a foreign university, college, or educational institution that is recognized by the competent authority in the respective country of study.
2. The student must not have been dismissed from the transferring university for disciplinary reasons.
3. Transfer to the university is only allowed during the specified transfer period determined by the academic calendar of the university.
4. The student must have completed at least one academic year at the transferring university.
5. The cumulative GPA at the time of transfer must not be less than 2.00 out of 5.00 or 1.00 out of 4.00, or equivalent for non-health colleges, and not less than 3.75 out of 5.00 or 2.50 out of 4.00, or equivalent for health colleges. In addition to any conditions

set by the college through the relevant committees and approved by the Permanent Admission and Registration Committee.

6. The student must complete at least 50% of the graduation requirements at the Northern Border University.
7. Available seats in the desired college must be considered based on the capacity.
8. If transferring to a different major, the admission requirements for that department and the transferred major must be met.
9. Each student is allowed to submit a transfer application to the Northern Border University only once. If the application is rejected, the applicant loses the opportunity to transfer to the university, whether to the same college or a different one.
10. Transfer from a diploma degree to a bachelor's degree is not allowed.
11. The percentage of transfer students should not exceed 10% of the general admission rate.
12. If it becomes evident, after a student's transfer, that the student was dismissed for disciplinary reasons, his enrollment is considered cancelled from the date of his transfer acceptance to the University.
13. Students who transfer from the Northern Border University to another university have the right to return to the Northern Border University, provided he is accepted into the same college he was initially accepted into.
14. When transferring to a different major than the one studied at the transferring university, the admission requirements specific to the department and the transferred major must be met.
15. Any other conditions set by the university council.

EQUIVALENCE

A student may apply for the equivalence of a course or courses that he has studied outside the university, subject to the following conditions:

1. The College Council evaluates the courses that were taken by the student outside the University, based on the recommendations of the departments that offer equivalent courses.

2. The course taken outside the university must be equivalent (comparable) in terms of both content and credit hours to the course for which equivalence is sought.
3. The content of the course must match at least 70% of the equivalent course at the university.
4. The student should have obtained a minimum grade of C or higher in the course being considered for equivalence.
5. The student is allowed to seek equivalency for courses constituting up to 50% of the study plan, provided that the percentage of specialized courses does not exceed 40%.
6. The courses deemed equivalent will be recorded in the student's academic transcript and included in the calculation of his cumulative GPA.

TRANSFER TO ANOTHER COLLEGE

A student may transfer from one college to another within the university, from one department to another within a college or from one major to another within a department in accordance with the following rules:

1. The student must obtain the approval of the academic department and the college to which the transfer is intended.
2. Transfer from one college to another within the university is only allowed during the specified transfer period determined by the university in the academic calendar.
3. The student must have completed at least one term at the college from which he is transferring.
4. The student's cumulative GPA at the time of transfer to the college must not be less than 2.00 out of 5.00.
5. Transfer between colleges is allowed only once during the university study period.
6. There must be available seats in the college to which the transfer is intended.
7. Meeting all admission requirements specific to the academic program to which the transfer is intended.
8. The percentage of transfers to and from the college should not exceed 10% of the general acceptance rate for the college.
9. The transcript of a student transferring from one college to another within the university will include all the courses the student has taken, including the grades and the term and cumulative GPA obtained throughout his period of study at the University.

10. Any other conditions set by the college council.

TRANSFER WITHIN A COLLEGE

1. A student may apply for a transfer from one program to another within the same college, subject to the approval of the Dean of the college and the relevant department.
2. The internal transfer process is competitive and depends on the availability of seats in the target program, as well as the student's cumulative grade point average (CGPA).
3. The student's academic transcript, after transferring from one department to another within a college or from one major to another within a department, will include a comprehensive record of all courses taken, along with corresponding grades, term GPA, and cumulative GPA achieved throughout his entire period of study at the university.

VISITING STUDENTS

A student may study courses at another university or in any branch of the university to which he belongs without transferring, and these courses are considered equivalent to those offered at the university, according to the following rules:

1. The student must obtain the approval of his college before he begins his studies.
2. His studies should be at a university or college inside Saudi Arabia or at a recognized college or university outside Saudi Arabia.
3. The course the student takes outside his college should be equivalent, in terms of content, to a course required for graduation.
4. If the visiting student's study is at a branch of the university to which he belongs, all courses that have been studied are recorded in his academic record, including the grades and the semester and cumulative GPAs obtained.
5. The University Council determines the maximum number of credit hours to be allocated to a visiting student from outside the university.
6. The course grades credited to the visiting student will be recorded in his academic record and included in the calculation of his cumulative GPA.
7. It is not allowed for visiting students to study for more than two academic terms.
8. A student who has transferred to the university and has to complete less than 50% of the courses required for graduation is not eligible to study as a visiting student at another university.

9. A student registered at the university may study concurrently some courses at another university or in any branch of the university to which he belongs, while respecting the course loads that a student is permitted to register for based on his GPA.
10. A student is allowed to enroll as a visiting student at up to two universities.
11. Visiting students from outside the university are issued a temporary university ID number until the end of their visit.

EXAMINATIONS

1. Colleges are required to establish procedures related to the conduct of midterm and final exams and announce them to the students with sufficient time before the exams.
2. Attendance at the final exam is not a requirement for passing the course if the student's classwork score led to a passing grade in the course.
3. A student who is absent from a final examination, will be given a zero grade for that examination. His grade in the course will be calculated on the basis of the classwork score he obtained over the term.
4. If a student fails to attend a final examination in any course but offers a compelling excuse, the College Council may choose to accept his excuse and allow him to take a make-up examination. The make-up examination must be taken prior to the end of the following semester. In such cases, the course grade will be given to the student after the make-up examination.
5. Final scores for all courses consist of 60% classwork and 40% final examination scores, except for seminar courses, research courses, and practical or field-oriented courses. The university council, in accordance with recommendations from the college council and the relevant department, makes decisions regarding the evaluation of these specific courses. The college council is responsible for assessing the students' performance on these courses.
6. The university council, upon the recommendation of the college council and the department responsible for the course, may incorporate practical or oral exams into the final examination of any course, and allocate specific scores for these components from the overall final exam score.

7. The classwork score is derived from a combination of oral exams, practical exams, research assessments, short tests, and other types of classroom activities, at least one of which must be a written test.
8. The scores for term classwork and the final exam must be recorded in the system by the course instructor. A hard copy should be printed and kept in the department after the course instructor's signature.
9. The results are submitted to the dean or vice dean for academic affairs of the college for approval.
10. Cheating in examinations, or attempting to cheat, or violating instructions, and examination regulations shall render the student subject to punishment in accordance with the Student Disciplinary By-Laws as issued by the University Council.
11. No student is allowed to enter the examination venue more than 30 minutes after the examination begins or leave before the first 30 minutes of the examination have passed.
12. A period of 72 hours is given from the end of the midterm and final exams for grading and recording the scores in the system.

INCOMPLETE GRADE

1. Students who complete the majority of the requirements for a course but are unable to finish the course may receive an incomplete (I) grade. A grade of incomplete will be assigned only with the consent of instructors after instructors and students have agreed on the academic work that needs to be completed and the date it is due. When the requirements for the course are completed, instructors will submit a grade that will replace the incomplete grade. Incomplete grades not completed by the end of the second week of the following semester will be changed to failing grades.
2. If a student completes the majority of the requirements for a course but is unable to finish the course by the required date, the council of the department responsible for teaching the course, based on the recommendation of the course instructor, may allow the student to complete the requirements of this course in the following academic term.
3. An incomplete grade (IC) shall be recorded in the student's academic record, and the course will not be included in the term or cumulative GPA unless the requirements of that course are completed.

4. When the requirements for the course are completed, instructors will submit a grade that will replace the incomplete grade.
5. Incomplete grades not completed by the end of the following term will be changed to Failing grade (F) and included in the term and cumulative GPA.
6. Incomplete grades are granted to individual students on a case-by-case basis. Incomplete grades should not be used as a mechanism to extend the course past the end of the term.

IN-PROGRESS GRADE

1. If a research-oriented course requires more than one term, an In-Progress grade (IP) shall be recorded in the student's academic transcript.
2. After the student completes the course, the grade he obtained shall be given.
3. If the student does not complete the course within the specified time, the department council responsible for teaching the course may approve recording an incomplete grade (IC) in the student's transcript.

GRADE APPEAL

1. A student may submit a request for an appeal against the final course grade, a reevaluation of answer sheets, or the mechanism for calculating the classwork score, to the relevant department, if he believes that the course grade is inaccurate. The request must be submitted within a maximum of two weeks from the appearance of the results.
2. The college establishes a student appeals committee chaired by the vice dean for academic affairs to reevaluate the final grade of the course.
3. The committee is responsible for reviewing and addressing appeals against the final grade and coordinating with the relevant department.
4. A student is permitted to submit more than one request for reevaluation in one academic term.
5. After the grade is revised, it is forwarded to the Deanship of Admission and Registration for recording.
6. If the student's grade is changed from a higher grade to a lower grade, the modification, along with the justifications, is submitted to the Vice-Presidency for Academic Affairs.

7. The college keeps the final exam papers for a period of one year starting from the date of the exam, after which they are disposed of.

GRADING

The general grade assigned to the cumulative GPA at the time of the student's graduation is based on his cumulative GPA and calculated as follows:

1. Excellent: If the cumulative GPA is not less than 4.50 out of 5.00.
2. Very Good: If the cumulative GPA is 3.75 or higher but less than 4.50 out of 5.00.
3. Good: If the cumulative GPA is 2.75 or higher but less than 3.75 out of 5.00.
4. Pass: If the cumulative GPA is 2.00 or higher but less than 2.75 out of 5.00.

HONORS RANKING:

1. First honors are granted to the student who has earned a cumulative GPA between 4.75 and 5.00 (out of 5.00) at the time of his graduation.
2. Second honors are granted to the student who has earned a cumulative GPA of 4.25 or higher but less than 4.75 (out of 5.00) at the time of his graduation.
3. The student who is eligible for first or second honors must meet the following criteria:
    a. He must not have failed any course completed at the university or any other university,
    b. He must have completed all graduation requirements within a specified period, the maximum of which is the average of the maximum and minimum limits for completing his degree program,
    c. He must have completed 60 % or more of the graduation requirements at the university from which he is graduating.

GRADUATION

1. An expected graduate is a student who is expected to graduate by the end of the current term. In this case, the number of credit hours registered for in the term must be greater

than or equal to the number of credit hours remaining to be completed according to the study plan.

2. A student graduates after successfully completing the graduation requirements according to the study plan and must achieve a cumulative GPA of not less than 2.00 out of 5.00.
3. If a student completes the requirements of the study plan with a cumulative GPA lower than 2.00 out of 5.00, the college council, based on the recommendation of the relevant department council, has the authority to designate suitable courses for the student to undertake in order to raise his cumulative GPA to 2.00 or higher.
4. A student cannot graduate from the university before the issuance of the graduation decision by the university council.

GRADES

The grades a student earns in each course are calculated as follows:

Overall score percentage	Description	Grade Code	Grade Point (Out of 5.00)
95 – 100	Exceptional	A+	5.00
90 – less than 95	Excellent	A	4.75
85 – less than 90	Superior	B+	4.50
80 – less than 85	Very Good	B	4.00
75 – less than 80	Above Average	C+	3.50
70 – less than 75	Good	C	3.00
65 – less than 70	High Pass	D+	2.50
60 – less than 65	Pass	D	2.00
Less than 60	Fail	F	1.00
-	In-Progress	IP	-
-	Incomplete	IC	-
-	Denial	DN	1.00
60 and above	No grade-Pass	NP	-
< 60	No grade-Fail	NF	-
-	Withdrawn	W	-
-	Exemption	E	-

8. PROGRAM CURRICULUM

A. CURRICULAR REQUIREMENTS FOR STUDENTS ADMITTED BEFORE 2024/2025

GRADUATION REQUIREMENTS

Below is the table outlining the graduation requirements for the Bachelor of Science in Industrial Engineering:

Requirements	Type	Credit Hours	Number of Courses
University Requirements	Required	6	3
	Elective	4	2
College Requirements	Required	39	14
	Elective	-	-
Program Requirements	Required	71	24
	Elective	9	3
Capstone Courses	Required	4	2
Field Training	Required	2	1
	Total	**135**	**49**

Note: Before enrolling in the Industrial Engineering program, students must complete a preparatory year. This preparatory year is an independent program, not under the Industrial Engineering program nor the College of Engineering. It is managed by the Deanship of Preparatory Year and Supporting Studies. The GPA earned during this preparatory year will not be counted towards the final cumulative GPA when the student completes the Industrial Engineering program. The courses in the first and second semesters of the preparatory year are as follows:

Preparatory Year / Term 1

Course Number	Course Title	Prerequisites	C.H.
1001-101	English 1	None	3
1002-101	Communication Skills	None	2
1002-102	Thinking Skills	None	2
1003-101	Math	None	3
1004-101	Computer Skills	None	3
		Total Credit Hours	**13**

Preparatory Year / Term 2

Course Number	Course Title	Prerequisites	C.H.
1001-102	English 2	1001-101, English 1	3
1003-102	Physics	None	3
1003-103	Chemistry	None	3
1004-102	Introduction to Programming	None	3
		Total Credit Hours	**12**

CURRICULAR COMPONENTS

1. UNIVERSITY REQUIREMENTS

a. Obligatory University Courses

No.	Course Number	Course Title	Prerequisites	C.H.
1	1601101	Islamic Culture 1	---	2
2	1601201	Islamic Culture 2	---	2
3	1602-101	Arabic Language	---	2
			Total Credit Hours	**6**

b. Elective University Courses (2 from 6)

No.	Course Number	Course Title	Prerequisites	C.H.
1	1601301	Islamic Culture 3	---	2
2	1601302	Islamic Culture 4	---	2
3	1601303	Islamic Culture 5	---	2
4	1601401	Islamic Culture 6	---	2
5	1601402	Islamic Culture 7	---	2
6	1601403	Islamic Culture 8	---	2
			Total Credit Hours	**4**

2. COLLEGE REQUIREMENTS

a. Obligatory College Courses

No.	Course Number	Course Title	Prerequisites	C.H.
1	1606-114	Reading I	---	2
2	1101101	General Physics 1	---	4
3	1104111	Engineering Mathematics I	---	4
4	1104212	Engineering Mathematics II	1104111	4
5	1104313	Engineering Mathematics III	1104212	4
6	1104314	Engineering Mathematics IV	1104111	3
7	1402-300	Numerical Methods in Engineering	1104313	3
8	1403101	Engineering Drawing	---	3
9	1403111	Basic Workshop	1403101	2
10	1405101	Introduction to Engineering Design	---	2
11	1405202	Engineering Economy	1104111	2
12	1405203	Engineering Management	---	2
13	1405204	Probability and Statistics	1104212	3
14	1405405	Engineering Ethics	1405101	1
			Total Credit Hours	**39**

3. PROGRAM REQUIREMENTS

a. Obligatory Program Courses

No.	Course Number	Course Title	Prerequisites	C.H.
1	1405211	Engineering Mechanics	1101101	3
2	1405212	Materials Engineering	1405211 & 1102101	3
3	1405221	Applied Engineering Statistics	1405204	3
4	1405313	Manufacturing Technology	1405212 & 1403111	3
5	1405323	Design of Industrial Information Systems	1405331	3
6	1405322	Operations Research I	1104314 & 1405204	3
7	1405331	Production Planning and control	1405203	3
8	1405341	Work Systems Analysis and Design	1405221	3
9	1405314	Control & Automation	1104313 & 1405313	3
10	1405332	Facilities Planning and Design	1405203 & 1405322	3
11	1405342	Human Factors Engineering	1405221	3
12	1405324	Operations Research II	1405322 & 1405221	3
13	1405498	B.SC. Project I	96 CH & Dept. Apr.	1
14	1405415	Computer Integrated Manufacturing	1405314 & 1405323	3
15	1405433	Industrial Quality Control	1405221	3
16	1405416	Manufacturing Economics	1405202 & 1405415	3
17	1405425	Simulation of Industrial Systems	1405324	3
18	1405499	B.SC. Project II	1405498	3
19	1405406	Special Topics in IE	Dept. Apr.	2
20	1405443	Industrial Safety Engineering	1405342	3
			Total Credit Hours	**57**

b. Obligatory Program Courses (From Outside the department)

No.	Course Number	Course Title	Prerequisites	C.H.
1	1606110	Writing (I)		2
2	1606111	Writing (II)	1606110	2
3	1102101	General Chemistry 1		4
4	1101202	General Physics 2	1101101	4
5	1402207	Basic of Electrical Engineering	---	3
6	1402221	Object Oriented Computer Programming	---	3
			Total Credit Hours	**18**

c. Elective Program Courses (3 courses with 9 Credit Hours)

No.	Course Number	Course Title	Prerequisites	C.H.
1	1405407	Introduction to Entrepreneurship	1405203	3
2	1405417	Material Handling and Packaging	1405314	3
3	1405418	Product Design and Development	1405314	3
4	1405426	Decision Analysis	1405324	3
5	1405327	Network Analysis	1405324	3
6	1405428	Queuing Systems	1405324	3
7	1405434	Lean Manufacturing and services	1405331	3
8	1405435	Maintenance and replacement policies	1405221	3
9	1405436	Project Management	1405203	3
10	1405437	Reliability Engineering	1405221	3
11	1405438	Supply chain management	1405331	3
12	1405444	Industrial Environmental Engineering	1405342	3
13	1405445	Industrial Hygiene Engineering	1405443	3
			Total Credit Hours	**9**

d. Field Training

The student spending 8 weeks at the training on-site in a manufacturing or service industry, 5 days a week and 6 hours per day with a total number of hours 240 hours.

No.	Course Number	Course Title	Prerequisites	C.H.
1	1405391	Summer Training	90 C.H. & Dept. Appr.	2
			Total Credit Hours	**2**

TYPICAL STUDY PLAN

Year 1/ Term 1

Course Number	Course Title	Prerequisites	C.H.
1104111	Engineering Mathematics 1	-	4
1403101	Engineering Drawing	-	3
1101101	General Physics I	-	4
1405101	Introduction to Engineering Design	-	2
1601101	Islamic Culture 1	-	2
1606114	Reading 1	-	2
		Total Credit Hours	**17**

Year 1/ Term 2

Course Number	Course Title	Prerequisites	C.H.
1403111	Basic Workshop	1403101	2
1104212	Engineering Mathematics II	1104111	4
1102101	General Chemistry I	-	4
1101202	General Physics 2	1101101	4
1606110	Writing 1	-	2
		Total Credit Hours	**16**

Year 2/ Term 3

Course Number	Course Title	Prerequisites	C.H.
1104313	Engineering Mathematics III	1104212	4
1405202	Engineering Economy	1104111	2
1405203	Engineering Management	-	2
1405211	Engineering Mechanics	1101101	3
1405204	Probability and Statistics	1104212	3
1606111	Writing II	1606110	2
		Total Credit Hours	**16**

Year 2/ Term 4

Course Number	Course Title	Prerequisites	C.H.
1405221	Applied Engineering Statistics	1405204	3
1602101	Arabic Language 1	---	2
1402207	Basic Electrical Engineering	---	3
1104314	Engineering Mathematics IV	1104111	3
1405212	Materials Engineering	1405211 & 1102101	3
1402221	Object-Oriented Computer Programming	-	3
		Total Credit Hours	**17**

Year 3/ Term 5

Course Number	Course Title	Prerequisites	C.H.
1601201	Islamic Culture 2	-	2
1405313	Manufacturing Technology	1405212 & 1403111	3
1402300	Numerical Methods in Engineering	1104313	3
1405322	Operations Research I	1104314 & 1405204	3
1405331	Production Planning and Control	1405203	3
1405341	Work Systems Analysis and Design	1405221	3
		Total Credit Hours	**17**

Year 3/ Term 6

Course Number	Course Title	Prerequisites	C.H.
1405314	Control & Automation	1104313 & 1405313	3
1405323	Design of Industrial Information Systems	1405331	3
1601xxx	Elective (1) Islamic Culture	---	2
1405332	Facilities Planning and Design	1405203 & 1405322	3
1405342	Human Factors Engineering	1405221	3
1405324	Operations Research II	1405322 & 1405221	3
		Total Credit Hours	**17**

Summer Term

Course Number	Course Title	Prerequisites	C.H.
1405391	Summer Training	90 CH & Department Approval	2
		Total Credit Hours	**2**

Year 4/ Term 7

Course Number	Course Title	Prerequisites	C.H.
1405498	B.SC. Project I	96 CH & Department Approval	1
1405415	Computer Integrated Manufacturing	1405314 & 1405323	3
1405405	Engineering Ethics	1405101	1
1405xxx	IE Elective (1)	Department Approval	3
1405433	Industrial Quality Control	1405221	3
1405443	Industrial Safety Engineering	1405342	3
1405425	Simulation of Industrial Systems	1405324	3
		Total Credit Hours	**17**

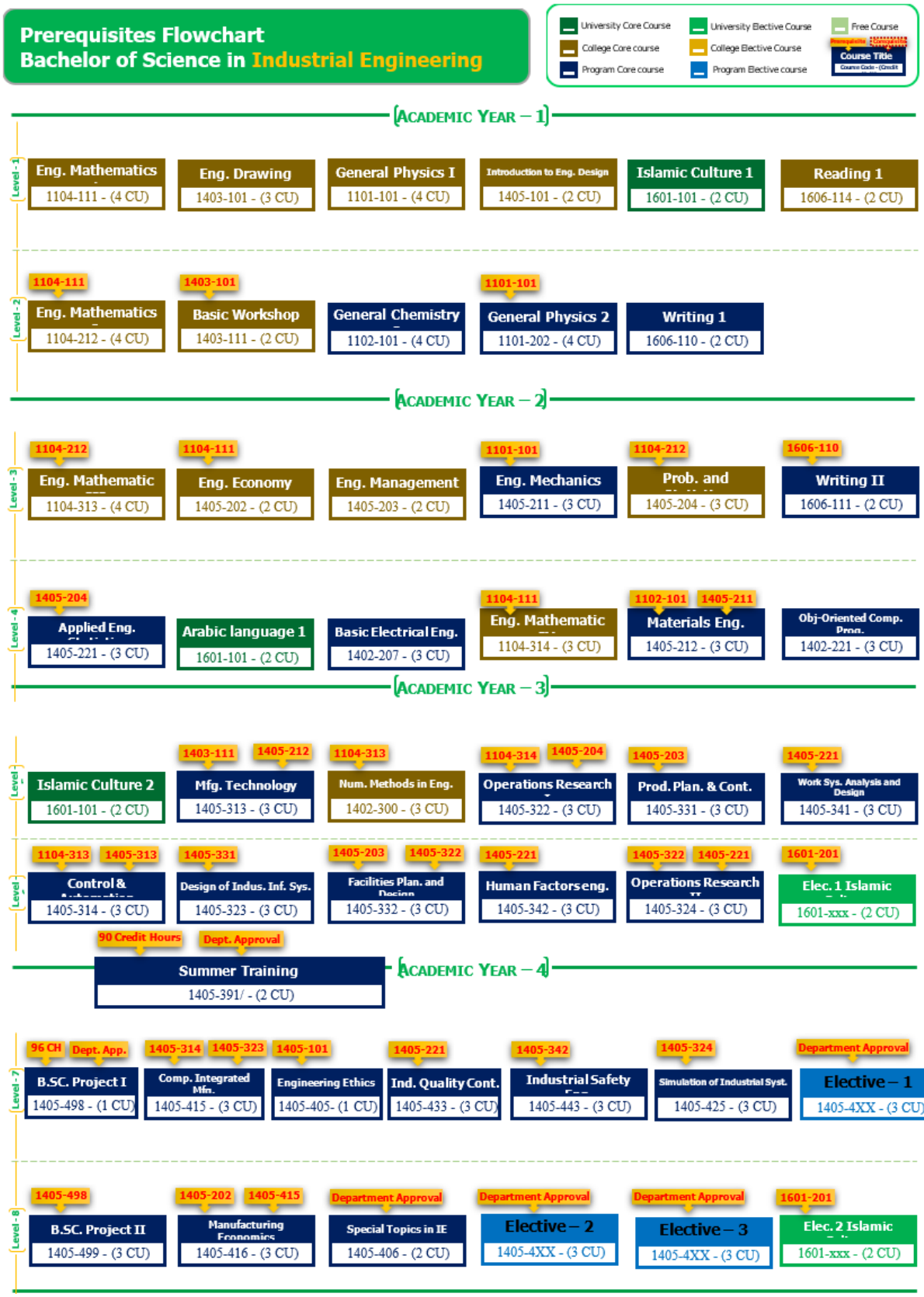
(*) The prerequisites for elective courses vary depending on each individual course.

Year 4/ Term 8

Course Number	Course Title	Prerequisites	C.H.
1405499	B.SC. Project II	1405498	3
1405416	Manufacturing Economics	1405202 & 1405415	3
1405406	Special Topics in IE	Department Approval	2
1601xxx	Elective (2) Islamic Culture	---	2
1405xxx	IE Elective (2)	Department Approval	3
1405xxx	IE Elective (3)	Department Approval	3
		Total Credit Hours	**16**

(*) The prerequisites for elective courses vary depending on each individual course.

Curriculum Flowchart



BRIEF COURSE DESCRIPTIONS

A - REQUIRED COURSES FROM IE DEPARTMENT		
1	**1405101 - Introduction to Engineering Design**	**2**
	This course introduces to the engineering students the basic concepts required for solving real engineering problem by using creative methods. Teamwork tools and skills. Characteristics, environment, and skills necessary for effective problem solving. Problem solving heuristics: Problem definition, Generating solutions, Deciding the course of actions, Implementing the solution, Evaluating the solution. Real- Life problem solving.	
2	**1405202 - Engineering Economy**	**2**
	Engineering Economy covers various topics, including the time value of money, interest rates, present worth, future worth, annual worth, equivalent uniform annual cost, benefit-cost analysis, and risk analysis. Throughout the course, students will acquire the necessary skills to analyze cash flow series, evaluate different alternatives, allocate costs and capital budgets, and assess the impact of depreciation and inflation on engineering investments. By applying these concepts, students will develop problem-solving abilities specific to engineering contexts. Moreover, they will learn to critically evaluate the economic feasibility of engineering projects. In Engineering Economy, students will gain a comprehensive understanding of the financial aspects associated with engineering decision making. The course provides a solid foundation for students to apply economic analysis techniques to real-world engineering scenarios.	
3	**1405203 - Engineering Management**	**2**
	This course introduces engineering management and technology management. Topics covered include the historical development of industrial management, introductory operations management, functions of technology management, planning production activities and managing engineering projects.	
4	**1405211: Engineering Mechanics**	3
	This course provides students with the fundamentals of Engineering Mechanics, determine moment of forces, analyze rigid body motion, determine velocities and accelerations and Use impulse and momentum principles to determine velocities.	
5	**1405204 - Probability and Statistics**	**3**
	This course introduces statistics and data description, probability theory, random variables and probability distributions, mathematical expectation, essential discrete and continuous random variables, fundamental sampling distributions, and data analysis techniques for one- and two-sample estimation problems.	
6	**1405221: Applied Engineering Statistics**	**3**
	Students will learn to conduct and complete parameter estimation, confidence intervals, statistical inference (Hypothesis testing), nonparametric tests, simple linear regression and correlation, multiple linear regression, analysis of variance (ANOVA) (two factors) and Design of Experiments (DOE) for n sample and n factors.	
7	**1405212: Materials Engineering**	**3**
	In this course the students will have the opportunity to learn something about the basic materials science and the fundamentals of the structure/property's relationships of all types of materials (metals and their alloys, ceramics, polymers and composites)	
8	**1405313: Manufacturing Technology**	**3**
	The students will obtain knowledge of engineering materials. Conventional manufacturing processes: Solidification processes, Sheet metal forming. Material removal processes, Joining and assembly processes. Non-conventional manufacturing processes.	

9	**1405322: Operations Research I**	**3**
	This course is designed to provide an understanding of the concepts of operations research problems. In addition, the course is to introduce the students how to formulate the linear programming models, the different approaches to solve the linear programming models including graphical model, simplex algorithm. Furthermore, this course is to concentrate on the assignment and transportation, integer and goal programming models	
10	**1405331: Production Planning and Control**	**3**
	Production Planning and Control is a study of the concepts, principles, problems, and procedures involved in managing manufacturing processes. This course is to introduce students to the important issues managers face in planning, controlling, and managing operations and supply chains. The focus will be placed on discussions of various types of production systems and several techniques commonly used for production planning and control. The students will also be exposed to selected models for the analysis and replenishment of inventories. And, will be introduced to, aggregate planning, operations strategy, capacity planning, supply-chain management, just-in-time systems, lean manufacturing, Materials Requirement Planning (MRP), Enterprise Resource Planning (ERP), short-term scheduling and sequencing, lean Production and Supply Chain Management.	
11	**1405341: Work System Analysis and Design**	**3**
	This course is designed to teach the fundamentals of work study, which is used in the examination of work in all their contexts. The topics covered in the course are introduction, problem solving tools (recording and analysis tools, activity charts, line balancing), operation analysis, manual work design (principles of motion economy, motion study), time study (performance rating and allowances), standard data and formulas, work sampling, predetermined time systems.	
12	**1405314: Control and Automation**	**3**
	This course introduces an introduction to linear feedback control theory, mathematical modeling of physical systems, transfer functions, block diagrams, and signal flow graphs, time-domain analysis of control systems, test signals, transient response, time domain specifications, steady-state error, and stability. The course also covers sensors, actuators, A/D and D/A conversion, hydraulic and pneumatic systems, Programmable Logic Controllers (PLCs), and Computer Integrated Manufacturing (CIM).	
13	**1405323: Design of Industrial Information Systems**	**3**
	This course is intended to engage students in analyzing and designing solutions to information systems problems related to industrial information systems. This includes industrial information systems planning and project identification and selection, how to construct a database, user interface and reports to summarize data database analysis and design and the human-computer interface and implementation.	
14	**1405332: Facilities Planning and Design**	**3**
	This course introduces the Fundamentals of facilities planning. Facilities design. Flow, space, and activity relationships. Material handling systems. Layout planning models. Warehouse operations. Quantitative facilities planning models. Preparing,	
15	**1405342: Human Factors Engineering**	**3**
	This course introduces ergonomics, which focuses on analyses of work and its environmental circumstances in an industrial engineering discipline. During the course, basic concepts of ergonomics such as the human body, human mind as well as human senses will be discussed. Based on this knowledge, one of the main goals of this course is to design an environment that is in interaction with humans.	
16	**1405324: Operations Research II**	**3**
	This course is a continuation for operations research I. Topics include non-linear programming, dynamic programming, waiting line models, Markov analysis, introduction to game theory and some industrial applications. This course aims to introduce students to some advanced operations research topics with their applications in industrial, service and public systems.	

17	**1405391: Summer Training**	**2**
	This training provides an opportunity to expose students to the reality of professional practice. Students are required to spend 08 weeks in training on-site in a manufacturing or service industry under the supervision of an industry-based advisor. Students are required to submit a report presenting details of the work undertaken and the documentation used during the training. Students are encouraged to use multimedia during the presentation of their work.	
18	**1405498: B.Sc. Design Project I**	**1**
	In Capstone Design Project 1 course, students collaborate in teams to address complex engineering problems using industrial engineering principles. The course focuses on the complete design process, from problem identification to evaluating design alternatives. Throughout the course, students engage in problem identification through research, analysis, and brainstorming. They generate multiple design alternatives and evaluate them against specified criteria, enabling them to make informed decisions for further development in Capstone Design Project 2. Students learn to tackle technical challenges while considering diverse stakeholder perspectives and integrating various constraints, such as safety, sustainability, and public welfare. They apply engineering knowledge and scientific principles to develop solutions that meet specified needs. Utilize project management techniques to plan, execute, and monitor the progress of design projects, ensuring efficient resource utilization and timeline adherence.	
19	**1405415: Computer Integrated Manufacturing System**	**3**
	This course is designed for introducing the students to the state-of-the-art concepts in computer integrated manufacturing systems. The course will cover the fundamentals of manufacturing technologies and automation. The students will work on Lab assignments using the available hardware and software in teams of two-three students. Lab assignments will include CAD/CAM integration, flexible manufacturing system and robot programming.	
20	**1405405: Engineering Ethics**	**1**
	This course introduces engineering professionalism and ethics. Students will learn about codes of ethics and professional conduct in various engineering disciplines, including NSPE, IEEE, AIChE, ASCE, ASME, and ACM-IEEE/CS. The course will explore the ethical responsibilities of engineers, including their commitment to safety, honesty, and environmental ethics. Students will also examine the role of engineering in social experimentation and in addressing global issues. Workplace responsibilities and rights will be discussed, along with the impact of technological progress on society. Through case studies and ethical dilemmas, students will develop critical thinking skills to identify and analyze ethical issues that arise in engineering practice. By the end of the course, students will be able to apply ethical principles to real-world engineering scenarios and make informed ethical decisions.	
21	**1405433: Industrial Quality Control**	**3**
	This course provides students with basic coverage of topics in quality engineering and introduces them to quality management concepts and their use in enhancing organizational performance and profitability. It provides comprehensive coverage of the use of modern techniques for quality control and improvement and gives special focus on the design of statistical quality problem-solving methodologies used to reduce process variability. Control charts for variables and attributes, process capability analysis, specification and tolerances, and acceptance sampling plans, are among the topics discussed in this course.	
22	**1405416: Manufacturing Economics**	**3**
	This course is designed to provide an understanding of traditional and contemporary product costing and pricing methods (Examination of the accounting practices to record and control material, labor, and overhead costs, and Activity Based Costing (ABC)). In addition to break-even analysis, cost-benefit analysis, performance measurement, and companies' financial statements. Also include analysis of variance for standard costs. In addition, the course explores the uses of costing techniques and practices for various types of management decisions.	

23	**1405425: Industrial Systems Simulation**	**3**
	In this course, students will learn the processes, tools, and techniques for performing effective simulation analyses, specifically: the basic underlying principles of how simulations work, how to collect and analyze input data, how to build basic simulation models using ARENA, how to verify and validate simulation models, and how to interpret and perform statistical analyses of simulation output.	
24	**1405499: B.Sc. Design Project II**	**3**
	Capstone design project II is a course that builds upon the knowledge and skills developed in Capstone design project I, and provides students with an opportunity to apply advanced engineering principles and methodologies to design and implement solutions for complex industrial engineering problems. Students will utilize appropriate testing and validation techniques to assess the performance and functionality of the designed solution, and continuously evaluate and improve the design implementation through feedback, data analysis, and iterative optimization. By the end of Capstone Design Project II, students will have gained valuable experience in tackling complex industrial engineering challenges, further developed their problem-solving and decision-making abilities, honed their communication skills, and deepened their understanding of ethical and professional responsibilities in design implementation and evaluation.	
25	**1405406: Special Topics in Industrial Engineering**	**2**
	This course is designed to provide a flexible topics course across several domains in the field of Industrial Engineering. The aim of this course is to introduce students to new relevant industrial engineering topics that have not covered in depth in other courses of the program.	
26	**1405443: Industrial Safety Engineering**	**3**
	This course will provide students with tools and guidelines to become safety engineers or managers in real world industries. It emphasizes on national and international safety regulations and standards, industrial hazard avoidance concepts and techniques, accident losses and its effect on organizations and the national economy, workers' compensation, and developing and maintaining safety programs, plant safety applications, management and its safety responsibilities, and emergency planning.	

B – ELECTIVE COURSES FROM IE DEPARTMENT		
1	**1405407: Introduction to Entrepreneurship**	**3**
	This course offers the basic framework for understanding the process of entrepreneurship, principles of management and related techniques in decision making, planning, marketing, and financial control. Exercises in product design and prototype development, preparation of workable project feasibility reports, practical ideas about launching their own enterprises are also covered.	
2	**1405426: Decision Analysis**	**3**
	The course aims to build the students' ability to understand the principles of decision making and methods for decision analysis under uncertainty to apply them in industrial areas. It creates an understanding to appreciate the use of expert judgment and the value of information in decision making and risk management. It is a design function to consider constraints, Solutions, and analysis of decision problems.	
3	**1405428: Queuing Systems**	**3**
	The course introduces students to "Queuing System" characteristic and notation, birth-death Markovian models, single and multiple servers, advanced Markovian models and their issues, non-Markovian models, queuing networks, the measure of effectiveness and optimization problems in queuing and solving case studies using numerical and simulation techniques.	
4	**1405434: Lean Manufacturing and services**	**3**
	This course attempts to provide students with the knowledge and practical skills to systematically analyze, develop, evaluate and deploy technical issues of Lean Manufacturing and Services; and understands the process that can run using less material, requiring less investment, using less inventory, consuming less space, and using fewer people.	
5	**1405435: Maintenance and replacement policies**	**3**
	This course presents; on the one hand, the Fundamentals of Industrial Maintenance, Maintenance Techniques: Infrared Thermography, Oil Analysis, Vibration Analysis... as well as Maintenance Methods: Total Productive Maintenance (TPM), FMEAC, SMED, 5S... On the other hand, an introduction to the life cycle costing concept for equipment acquisition, operation, and replacement decision-making. Designing for reliability and determination of optimal maintenance and replacement policies for both capital equipment and components. Topics include identification of an item's failure distribution and reliability function, reliability of series, parallel, and redundant systems design configurations, time-to-repair and maintainability function, age and block replacement policies for components, the economic life for capital equipment, provisioning of spare parts.	
6	**1405437: Reliability Engineering**	**3**
	This course introduces the introduction to reliability theory, The Failure Distribution, Constant Failure Rate Model, Time-Dependent Failure Models, Reliability of Systems, State Dependent Systems, Design for Reliability, Maintainability, Design for Maintainability, Availability, Data Collection and Empirical Methods, Reliability Testing, Goodness-of-Fit Tests, Introduction to fault tree analysis.	
7	**1405438: Supply Chain Management**	**3**
	This course is intended to introduce students to supply chain management including its history, purpose, general principles, career opportunities, and its interrelationships with other functional areas of businesses. It is also intended to introduce standard terms and concepts for communications with supply chain personnel. This course teaches concepts useful in efficiently managing Supply Chains. Topics covered include: the role of Supply Chain Management in overall competitive strategy, terms, definitions, Supply Chain examples, key performance measures, and tools for improving Supply Chain performance. The level of discussion varies from long-term strategic planning to daily control of Supply Chain & business processes.	

8	**1405444: Industrial Environmental Engineering**	**3**
	This course is designed to introduce students to the basics of natural systems, industrial environment as part of the ecological system, water quality management, waste water treatment, air pollution, noise pollution, solid waste management, hazardous waste management and ionizing radiation.	
9	**1405445: Industrial Hygiene Engineering**	**3**
	This course introduces the methods used by industrial hygienists to control occupational diseases. It covers the physical form of air contaminants, air sampling and analysis, engineering controls, and the preparation of survey protocols that uses the concepts of the natural sciences and mathematics, and effective public-health management.	
10	**1405436: Project Management**	**3**
	This course provides a comprehensive overview of engineering project management, covering all aspects of the project life cycle from inception to completion. Students will learn how to plan, implement, and manage successful projects, including the processes of budgeting, scheduling, and resource allocation. The course will cover project network tools for project planning and monitoring, cost optimization techniques to meet project objectives, project crashing, time-cost trade-offs, and risk analysis.	

C - REQUIRED COURSES FROM OTHER ENGINEERING DEPARTMENTS		
1	**1403101 Engineering Drawing**	**3**
	Introduction: Skills of freehand sketching. Methods of projection: orthographic, isometric. Dimensioning of views. Third view prediction. Primary and successive auxiliary views. Intersections of surfaces and bodies. Sectioning.	
2	**1403111 Basic Workshop**	**2**
	Introduction to manufacturing processes. Workshop safety. Engineering materials. Workshop measurements. Bench work. Sand casting process. Metal forming processes and sheet metal working. Metal cutting processes. Joining of materials.	
3	**1402207: Basic Electrical Engineering**	**3**
	This course is presented in the following order: the basic definitions of electric quantities; Ohm's and Kirchhoff's laws as well as nodal analysis in DC circuits and AC circuits; series and parallel network; three-phase circuits; Introduction in single phase transformer; introduction in DC machines; introduction in AC machines.	
4	**1402-221: Object-oriented computer programming**	**3**
	This course presents a conceptual and practical introduction to imperative and object-oriented programming, exemplified by C++. As well as providing grounding in the use of C++, the course will cover general principles of programming.	
5	**1402300: Numerical Methods in Engineering**	**3**
	This course covers the concepts and techniques for numerical methods and algorithms, Solution of non-linear equations- solution of large systems of linear equations, Interpolation, Curve fitting, Numerical differentiation and integration, Solution of differential equations.	

D - REQUIRED COURSES FROM OTHER COLLEGES		
1	**1104111: Engineering Mathematics I**	**4**
	This course is considered as a first course in differential calculus, dealing mainly with differentiations of elementary functions and their applications.	
2	**1606114: Reading I**	**2**
	This course aims at developing students' reading strategies and skills in English at the basic level. It will address the following skills and strategies: mechanics of reading, reading techniques, vocabulary skills and extracting general information.	
3	**1104212: Engineering Mathematics II**	**4**
	This course is mainly dealing with integral calculus, including the following topics: Inverse functions, inverse trigonometric and hyperbolic functions and their derivatives, L'Hopital's rule, The indefinite integral, methods of integration (substitutions, parts, trigonometric substitutions, partial fractions …). The definite integral, the fundamental theorem of calculus. Applications of definite integral (Area between two curves, volumes, length of a plane curve, area of a surface of revolution …).	
4	**1102101: General Chemistry 1**	**4**
	Introduction to the general principles of chemistry for students planning a professional career in chemistry, a related science, the health professions, or engineering. The SI units, the chemical formula, Naming covalent and ionic compounds, Stoichiometry, Atomic structure, Electron configuration, Periodic table, Chemical bonding, Gases, Chemical equilibrium, Acids and Bases, Organic chemistry and Biochemistry chemistry. Weekly laboratory experiments aiming the safety rules in chemistry lab. and identify the main inorganic acidic and basic radicals based on specific qualitative tests. Weekly discussion sessions focus on homework assignments and lecture material.	
5	**1101101: General Physics I**	**4**
	Study of units and dimensions. Study of vectors and their properties. Motion in different dimensions and projectile motion. Newton's laws with examples involving friction force or without friction force. The study of kinetic and potential energy conservation and the calculation of work and power. Elastic and inelastic collision and the difference between them. The study rigid body rotation. Lab Experiments: Simple pendulum, Verification of Newton's 2nd law, Static and kinetic friction, Projectile motion, Hook's law, Free fall, Force balance table, Rotational motion.	
6	**1101202: General Physics 2**	**4**
	The course is interested in the study of the principles of electricity and magnetism. The course provides the students to the fundamentals of electric charge, electric force, electric field, electric potential, magnetic field, magnetic force, capacitors and dielectrics.	
7	**1104313: Engineering Mathematics III**	**4**
	The topics covered include ordinary differential equations and some methods to solve them.	
8	**1606110 Writing I**	
	This course acquaints students with the process of writing basic sentences using proper spelling, grammar, punctuation, and structure. Students will be exposed to the process of combining sentences into simple paragraphs.	
9	**1606111: Writing II**	**2**
	This course further develops students' skills in paragraph writing. Students will edit and review paragraphs to identify mistakes. Students will progress to writing multi-paragraph essays with a clear introduction and development of ideas.	
10	**1104314: Engineering Mathematics IV**	**3**
	The course typically begins with an introduction to vectors and vector spaces, including concepts such as linear independence, basis, and dimension. Then, students learn about linear transformations and matrices, including topics such as matrix multiplication, inverses, and determinants.	

B. CURRICULAR REQUIREMENTS FOR STUDENTS ADMITTED IN 2024/2025 AND ONWARD

GRADUATION REQUIREMENTS

Below is the table outlining the graduation requirements for the Bachelor of Science in Industrial Engineering:

Requirements	Type	Credit Hours	Number of Courses
University Requirements	Required	10	5
	Elective	4	2
College Requirements	Required	37	11
	Elective	-	-
Program Requirements	Required	87	28
	Elective	9	3
Capstone Courses	Required	4	2
Field Training	Required	0	1
Free Courses	Elective	4	2
	Total	**155**	**54**

CURRICULAR COMPONENTS

1. UNIVERSITY REQUIREMENTS

a. Obligatory University Courses

To meet the university requirements, students must successfully complete a total of seven courses. Five of these courses are compulsory; three have predefined content, and the other two are selected from a range of eight courses centered around Islamic culture. To fulfill the remaining two course requirements, students have the option to choose from a set of five elective courses.

- **Predefined Courses (3 courses)**

No.	Course Number	Course Title	Prerequisites	C.H.
1	IT100	Digital Culture	-	2
2	GNCR100	University Skills	-	2
3	HR100	Entrepreneurship	-	2
			Total Credit Hours	6

- **Islamic Culture Courses (2 courses with 4 Credit Hours among a set of 8 courses)**

No.	Course Number	Course Title	Prerequisites	C.H.
1	ISLS100	The Origins of Islamic Culture	-	2
2	ISLS102	Studies in the Prophet's Biography	-	2
3	ISLS109	Medical Jurisprudence	-	2
4	ISLS104	The Family in Islam	-	2
5	ISLS107	Economic System	-	2
6	ISLS105	Professional Ethics	-	2
7	ISLS106	Women and their Developmental Role	-	2
8	ISLS108	Contemporary Issues	-	2
			Total Credit Hours	4

b. Elective University Courses (2 courses with 4 Credit Hours among a set of 5 courses)

No.	Course Number	Course Title	Prerequisites	C.H.
1	GNCR103	Kingdom & Its Pioneering Role	-	2
2	ARAB-103	Academic Writing Skills	-	2
3	GNCR104	Fitness and Sport Science	-	2
4	BIO-104	Sustainable Development	-	2
5	CUET-101	Lifelong learning skills	-	2
			Total Credit Hours	4

2. COLLEGE REQUIREMENTS

a. Obligatory College Courses

No.	Course Number	Course Title	Prerequisites	C.H.
1	LNGT101	English 1	4	-
2	LNGT102	English 2	4	LNGT101
3	LNGT103	English for Scientific and Engineering Purposes	2	-
4	MATH101	Calculus 1	4	-
5	MATH202	Calculus 2	4	MATH101
6	MATH222	Linear Algebra	3	MATH101
7	MATH241	Differential Equations 1	3	MATH202
8	PHYS101	General Physics 1	4	-
9	CHEM101	General Chemistry 1	4	-
10	CE201	Computer Aided Drawing	2	-
11	EE200	Introduction to Computer Programming	3	-
			Total Credit Hours	**37**

3. PROGRAM REQUIREMENTS

a. Obligatory Program Courses (From IE Department)

No.	Course Number	Course Title	Prerequisites	C.H.
1	IE211	Introduction to Industrial Engineering	None	2
2	IE221	Engineering Economy	MATH101 (Calculus 1)	2
3	IE251	Probability and Statistics for Engineers	MATH202 (Calculus 2)	3
4	IE351	Applied Engineering Statistics	IE251 (Probability and Statistics for Engineers)	3
5	IE222	Engineering Management	None	3
6	IE212	Computer Application in Industrial Engineering	EE200 (Introduction to Computer Programming)	3
7	IE331	Production Planning and Control	IE222 (Engineering Management)	3
8	IE332	Manufacturing Systems	IE331 (Production Planning and Control)	3
9	IE361	Safety Engineering	None	3
10	IE362	Work Systems Analysis and Design	IE351 (Applied Engineering Statistics)	3
11	IE333	Service Operations Analysis	IE222 (Engineering Management)	2
12	IE371	Industrial Information Systems Design	IE212 (Computer Application in Industrial Engineering)	3
13	IE341	Operations Research I	MATH222 (Linear Algebra)	3
14	IE431	Lean Manufacturing and Services	IE332 (Manufacturing Systems) & IE362 (Service Operations Analysis)	3
15	IE441	Operations Research II	IE341 (Operations Research I) & IE251 (Probability and Statistics for Engineers)	3
16	IE451	Design of Experiments	IE351 (Applied Engineering Statistics) & MATH203 (Calculus 3)	3
17	IE461	Human Factors Engineering	IE362 (Work Systems Analysis and Design) & IE361 (Safety Engineering)	3
18	IE421	Engineering Cost Analysis	IE221 (Engineering Economy)	3
19	IE432	Supply Chain Engineering	IE331 (Production Planning and Control)	3
20	IE471	Industrial Automation and Robotics	MATH241 (Differential Equations 1), MATH222 (Linear Algebra), EE207 (Basic Electrical Engineering)	3
21	IE452	Industrial Quality Control	IE351 (Applied Engineering Statistics)	3
22	IE422	Engineering Project Management	IE222 (Engineering Management)	3
23	IE433	Facilities Planning and Design	IE351 (Applied Engineering Statistics)	3
24	IE551	Maintenance and Reliability Engineering	IE351 (Applied Engineering Statistics) & IE222 (Engineering Management)	3
25	IE541	Industrial Systems Simulation	IE441 (Operations Research II)	3
26	IE571	Product Design and Development	IE451 (Design of Experiments)	3
27	IE591	Capstone Project I	120 Credit Hours & Department Approval	2
28	IE522	Engineering Professionalism and Ethics	None	2
29	IE572	Sustainability Engineering	IE571 (Product Design and Development)	3
30	IE592	Capstone Project II	IE591 (Capstone Project I)	2
			Total Credit Hours	84

b. Obligatory Program Courses (Outside IE Department)

No.	Course Number	Course Title	Prerequisites	C.H.
1	EE207	Basic Electrical Engineering	PHYS101 (General Physics 1)	3
2	MATH203	Calculus III	MATH202 (Calculus 2)	4

			Total Credit Hours	**3**

c. Elective Program Courses (3 courses with 9 Credit Hours among a set of 15 courses)

No.	Course Number	Course Title	Prerequisites	C.H.
1	IE512	Feasibility Study	IE421 (Engineering Cost Analysis)	3
2	IE552	Computational Methods in Industrial Engineering	IE441 (Operations Research II)	3
3	IE542	Decision Analysis	IE441 (Operations Research II)	3
4	IE543	Network Optimization	IE441 (Operations Research II)	3
5	IE544	Queuing Systems	IE441 (Operations Research II)	3
6	IE573	Additive Manufacturing	IE332 (Manufacturing Systems)	3
7	IE574	Computer Aided Manufacturing and Design	IE332 (Manufacturing Systems)	3
8	IE531	Enterprise Resource Planning	IE331 (Production Planning and Control)	3
9	IE575	Healthcare Systems Engineering	IE333 (Service Operations Analysis)	3
10	IE553	Quality Management Systems	IE452 (Industrial Quality Control)	3
11	IE554	Introduction to Applied Data Analytics	IE351 (Applied Engineering Statistics) & IE371 (Industrial Information Systems Design)	3
12	IE561	Occupational Health and Safety	IE361 (Safety Engineering)	3
13	IE532	Material Handling and Logistics	IE433 (Facilities Planning and Design)	3
14	IE523	Introduction to Finance and Asset Management	IE222 (Engineering Management) & IE221 (Engineering Economy)	3
			Total Credit Hours	9

d. Field Training

The student spending 8 weeks at the training on-site in a manufacturing or service industry, 5 days a week and 6 hours per day with a total number of hours 240 hours.

No.	Course Number	Course Title	Prerequisites	C.H.
1	IE491	Field Training	Department Approval & 110 Credit Hour	0
			Total Credit Hours	**0**

1. Free Courses

No.	Course Number	Course Title	Prerequisites	C.H.
1	XXXXXX	Free Course 1	---	2
2	XXXXXX	Free Course 2	---	2
			Total Credit Hours	**4**

The list of free courses available to students in the Industrial Engineering program at Northern Border University includes the following:

No.	Course Number	Course Title	Prerequisites	C.H.
1	IS101	Digital transformation	-	2
2	ELP102	Leadership and change management	-	2
3	GNCR105	Volunteering and social responsibility	-	2
4	PSY115	Skills to deal with people with disabilities	-	2

TYPICAL STUDY PLAN

Year 1/ Term 1

Course Number	Course Title	Prerequisites	C.H.
MATH101	Calculus 1	None	4
ISLSxxx	Elective Islamic Culture 1	None	2
LNGT101	English 1	None	4
IT100	Digital Culture	None	2
		Total Credit Hours	**12**

Year 1/ Term 2

Course Number	Course Title	Prerequisites	C.H.
LNGT102	English 2	LNGT101	4
GNCR100	University Skills	None	2
MATH202	Calculus 2	MATH101	4
LNGT103	English for Scientific and Engineering Purposes	None	2
		Total Credit Hours	**12**

Year 2/ Term 3

Course Number	Course Title	Prerequisites	C.H.
MATH203	Calculus 3	MATH202	4
EE200	Introduction to Computer Programming	None	3
PHYS101	General Physics 1	None	4
IE211	Introduction to Industrial Engineering	None	2
IE221	Engineering Economy	MATH101	2
XXXXXX	University Elective 1	None	2
		Total Credit Hours	**17**

Year 2/ Term 4

Course Number	Course Title	Prerequisites	C.H.
MATH222	Linear Algebra	MATH101	3
IE251	Probability and Statistics for Engineers	MATH202	3
IE222	Engineering Management	None	3
IE212	Computer Application in Industrial Engineering	EE200	3
CHEM101	General Chemistry 1	None	4
ISLSxxx	Islamic Culture 2	None	2
		Total Credit Hours	**18**

Year 3/ Term 5

Course Number	Course Title	Prerequisites	C.H.
MATH241	Differential Equations 1	MATH202	3
IE351	Applied Engineering Statistics	IE251	3
IE341	Operations Research I	MATH222	3
IE331	Production Planning and Control	IE222	3
CE201	Computer Aided Drawing	None	2
EE207	Basic Electrical Engineering	PHYS101	3
		Total Credit Hours	**17**

Year 3/ Term 6

Course Number	Course Title	Prerequisites	C.H.
IE332	Manufacturing Systems	IE331	3
IE361	Safety Engineering	None	3
IE362	Work Systems Analysis and Design	IE351	3
IE333	Service Operations Analysis	IE222	2
IE371	Industrial Information Systems Design	IE212	3
HR100	Entrepreneurship	None	2
XXXXXX	University Elective 2	None	2
		Total Credit Hours	**18**

Year 4/ Term 7

Course Number	Course Title	Prerequisites	C.H.
IE441	Operations Research II	IE341 & IE251	3
IE451	Design of Experiments	IE351 & MATH203	3
IE431	Lean Manufacturing and Services	IE332 & IE362	3
IE461	Human Factors Engineering	IE362 & IE361	3
IE421	Engineering Cost Analysis	IE221	3
XXXXXX	Free Course 1	None	2
		Total Credit Hours	**17**

Year 4/ Term 8

Course Number	Course Title	Prerequisites	C.H.
IE432	Supply Chain Engineering	IE331	3
IE471	Industrial Automation and Robotics	MATH241, MATH222 & EE207	3
IE452	Industrial Quality Control	IE351	3
IE422	Engineering Project Management	IE222	3
IE433	Facilities Planning and Design	IE351	3
XXXXXX	Free Course 2	None	2
		Total Credit Hours	**17**

Summer Term

Course Number	Course Title	Prerequisites	C.H.
IE491	Field Training	Department Approval & 110 Credit Hours	0

Year 5/ Term 9

Course Number	Course Title	Prerequisites	C.H.
IE551	Maintenance and Reliability Engineering	IE351 & IE222	3
IE541	Industrial Systems Simulation	IE441	3
IE571	Product Design and Development	IE451	3
IE5XX	IE Elective (1)	Department Approval*	3
IE591	Capstone Project I	120 Credit Hours & Department Approval	2
		Total Credit Hours	**14**

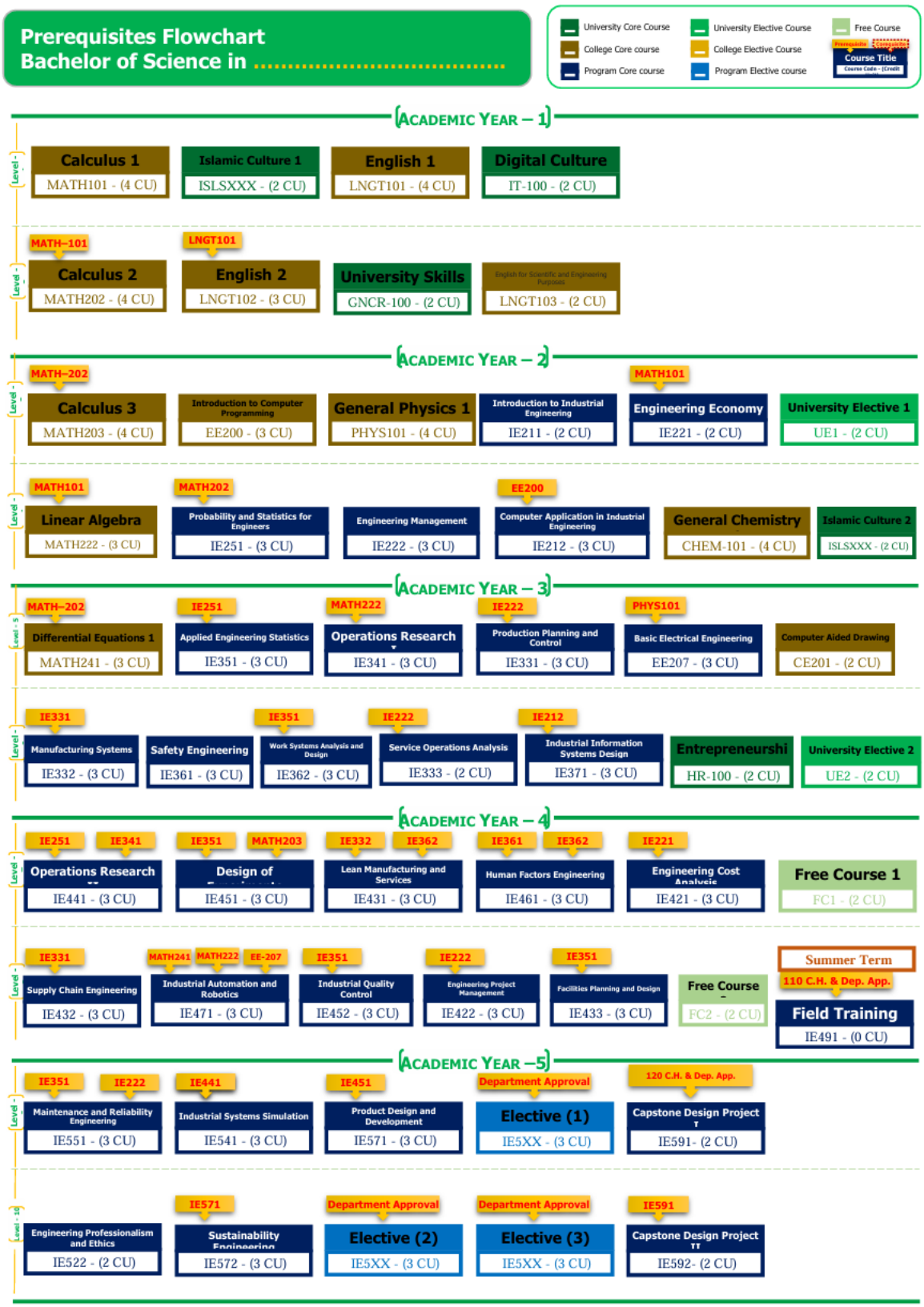
(*) The prerequisites for elective courses vary depending on each individual course.

Year 5/ Term 10

Course Number	Course Title	Prerequisites	C.H.
IE522	Engineering Professionalism and Ethics	None	2
IE572	Sustainability Engineering	IE571	3
IE5XX	IE Elective (2)	Department Approval*	3
IE5XX	IE Elective (3)	Department Approval*	3
IE592	Capstone Project II	IE591	2
		Total Credit Hours	**13**

(*) The prerequisites for elective courses vary depending on each individual course.

Curriculum Flowchart



COURSE DESCRIPTIONS

The course description is organized as it appears in the study plan. For the Islamic culture courses, university elective courses, and elective program courses, they can be found at the end of the description.

Academic Year 1 / Level 1

Course Code	Course Name	Course Description
MATH101	Calculus 1	This course is considered as a first course in differential calculus, dealing mainly with differentiations of elementary functions and their applications.
-	Elective Islamic Culture 1	Please refer to the descriptions of the corresponding courses located at the end of this section.
LNGT101	English 1	This course is designed for students with adequate previous exposure to general English. It is intended to provide students with a foundation from which they can advance to B1 English on the Common European Framework of Reference for Languages (CEFR). The course will build students' English proficiency in the four language skills and further enhance these skills with the linguistic and lexical competencies, as well as develop thinking skills, presentation skills, and related sub-skills.
IT100	Digital Culture	This course includes a set of general knowledge related to computer science and communications, in addition to modern trends in digital technology and the principles of cybersecurity. The course also deals with skills related to digitization and education, including dealing with a number of office programs in addition to using cloud services, e-learning platforms, and search engines. This course also highlights the commitment to the ethics of the digital world in various uses of computers through the aforementioned topics.

Academic Year 1 / Level 2

Course Code	Course Name	Course Description
LNGT102	English 2	This course is designed for students with adequate previous exposure to general English. It is intended to provide students with a foundation from which they can advance to B2 English on the Common European Framework of Reference for Languages (CEFR). The course will build students' English proficiency in the four language skills and further enhance these skills with the linguistic and lexical competencies, as well as develop thinking skills, presentation skills, and related sub-skills.
GNCR100	University Skills	This course includes a set of skills that a student should acquire in his university life, such as study skills, communication skills in the university environment, presentation skills, public speaking, problem-solving, self-discovery, and marketing skills that enable him to develop himself intellectually, psychologically, socially, functionally, and in research.
MATH202	Calculus 2	This course is mainly dealing with integral calculus, including the following topics: Inverse functions, inverse trigonometric and hyperbolic functions and their derivatives, L'Hopital's rule, The indefinite integral, methods of integration (substitutions, parts, trigonometric substitutions, partial fractions ...). The definite integral, the fundamental theorem of calculus. Applications of definite integral (Area between two curves, volumes, length of a plane curve, area of a surface of revolution ...).
LNGT103	English for Scientific and Engineering Purposes	This course assists students in developing the necessary skills to communicate effectively using English in professional situations. It focuses on the development of appropriate and relevant language skills and language content that are directly applicable to a wide range of professional contexts. In addition, it develops student's ability to communicate and interact with others through focusing on dialogue, persuasion, negotiation, personal interview, presentation skills. It incorporates multiple assignments with opportunities for individualized feedback. These activities are based on a diverse collection of topics that will further develop students' vocabulary and grammar and their subsequent usage in a variety of writings, i.e. emails and reports.

Academic Year 2 / Level 3

Course Code	Course Name	Course Description
MATH203	Calculus 3	This course is mainly dealing with calculus of several variables, including the following topics, Parametric equations and polar coordinates, calculus with parametric and polar curves, and applications of parametric curves and polar coordinates. Functions of several variables, limits and continuity, partial derivatives, the chain rule, implicit differentiations, applications of partial derivatives. Multiple integrals: Double integrals over rectangles, general regions, polar coordinates, applications of double integrals. Triple integrals in boxes, cylindrical, and spherical coordinates. Change of variables in multiple integrals.
EE200	Introduction to Computer Programming	This course introduces basic computer programming concepts using the C++ language. From variables and data types to control structure and functions, students will learn how to transform ideas into code and solve problems.
PHYS101	General Physics 1	The course is interested in the study of units and dimensions, vectors and their properties, motion in different dimensions and projectile motion. Newton's laws with examples involving friction force or without friction force. The study of kinetic and potential energy conservation and the calculation of work and power. Elastic and inelastic collision and the difference between them. The study rigid body rotation. Lab Experiments: Simple pendulum, Verification of Newton's 2nd law, Static and kinetic friction, Projectile motion, Hook's law, Free fall, Force balance table, Rotational motion, collision.
IE211	Introduction to Industrial Engineering	This course introduces students to the industrial engineering subject matter areas, problem types, and design/analysis approaches, techniques, and methodologies. Special emphasis on formulation and design alternatives for problem solving.
IE221	Engineering Economy	Engineering Economy introduces fundamental concepts and techniques for making sound economic decisions in engineering projects. The course covers topics such as the time value of money, interest rates, cash flow analysis, benefit-cost analysis, risk analysis, and depreciation. Students will gain the skills to evaluate project proposals, allocate resources, and assess the financial feasibility of engineering investments. Engineering Economy provides a practical foundation for making informed economic decisions in engineering contexts.
-	University elective 1	Please refer to the descriptions of the corresponding courses located at the end of this section.

Academic Year 2 / Level 4

Course Code	Course Name	Course Description
MATH222	Linear Algebra	The course typically begins with an introduction to vectors and vector spaces, including concepts such as linear independence, basis, and dimension. Then, students learn about linear transformations and matrices, including topics such as matrix multiplication, inverses, and determinants.
IE251	Probability and Statistics for Engineers	This course explores the mathematical foundations of statistics and probability theory. It covers fundamental concepts such as statistical data description, rigorous probability theory, random variables, probability distributions, mathematical expectations, and in-depth explorations of discrete and continuous random variables. The course also includes a rigorous study of sampling distributions and statistical techniques for one- and two-sample estimation problems. Through mathematical rigor, students will develop a strong foundation in statistical analysis and probability theory. This mathematical-based course in probability and statistics will serve as a fundamental base for engineers in their subsequent engineering courses.
IE222	Engineering Management	This course provides an introduction to the principles and practices of engineering management and technology management. It covers the historical development of engineering management, the fundamentals of operations management, the key functions of engineering managers, decision-making processes in engineering organizations, production planning techniques, and project management methodologies specifically tailored for engineering projects.
IE212	Computer Application in Industrial Engineering	Provides basic familiarization, instruction, and competence with common computer applications used in Industrial Engineering. Focuses on providing students with expertise in using computational tools for various applications, with hands-on practice and deepening understanding in their use.
CHEM101	General Chemistry 1	Introduction to the general principles of chemistry for students planning a professional career in chemistry, a related science, the health professions, or engineering. The SI units, the chemical formula, Naming covalent and ionic compounds, Stoichiometry, Atomic structure, Electron configuration, Periodic table, Chemical bonding, Gases, Chemical equilibrium, Acids and Bases, Organic chemistry and Biochemistry chemistry. Weekly laboratory experiments aiming the safety rules in chemistry lab. and identify the main inorganic acidic and basic radicals based on specific qualitative tests. Weekly discussion sessions focus on homework assignments and lecture material.
-	Islamic Culture 2	Please refer to the descriptions of the corresponding courses located at the end of this section.

Academic Year 3 / Level 5

Course Code	Course Name	Course Description
MATH241	Differential Equations 1	The topics covered include ordinary differential equations and some methods to solve them.
IE351	Applied Engineering Statistics	This course offers a solid mathematical basis for key statistical methods used in engineering, emphasizing both theoretical understanding and practical applications. Students will engage with Hypothesis Testing and Confidence Intervals to learn the basics of statistical inference. The curriculum includes Nonparametric Tests, allowing for the analysis of data beyond standard distribution assumptions. Essential techniques like Simple and Multiple Linear Regression are covered, enabling students to model and interpret relationships between variables. The course introduces Time Series Analysis for handling data collected over sequential intervals. It also demystifies the principles of Bayesian Statistics as an alternative framework for statistical inference. An introduction to Multivariate Statistics is provided, focusing on the analysis of datasets with multiple interrelated variables. This course is designed to build a strong foundational understanding of statistical concepts, preparing students for advanced studies or professional roles in engineering fields.
IE341	Operations Research I	This comprehensive course searches into the mathematical foundations of operations research (OR), providing a thorough grounding in the theoretical principles and techniques that underpin OR methodologies. Students will gain a deep understanding of optimization theory, linear programming, network flows, integer linear programming, and distribution models, all within a framework of mathematical rigor.
IE331	Production Planning and Control	Production Planning and Control covers the specific strategies and methodologies used in the planning, scheduling, and management of production processes. Distinct from a broader study of manufacturing systems, this course emphasizes the operational aspects of production management. Key topics include detailed analysis and application of production planning techniques, such as demand forecasting, capacity planning, and inventory management. Special attention is given to the practical aspects of scheduling, including short-term scheduling and sequencing, and the optimization of production workflows. The course also covers the fundamentals of Materials Requirement Planning (MRP) and Enterprise Resource Planning (ERP) systems, focusing on their roles in synchronizing production activities. Students will explore the challenges and solutions in just-in-time (JIT) production environments and learn about approaches to achieve efficiency and responsiveness in production operations.
CE201	Computer Aided Drawing (CAD)	This course represents an introduction to engineering drawings. Computer-aided drawings (CAD) is utilized to produce 2-D engineering drawings. The course is divided into two sections: AutoCAD and drawing. The course begins by teaching the main basics and features of AutoCAD software. Then AutoCAD is used to create pictorial projections, section views, auxiliary views, and dimensioning.
EE207	Basic Electrical Engineering	This course provides the required knowledge of basic electrical engineering namely basic electric circuits and electrical machines including Ohm's and Kirchhoff's laws, Mesh analysis in DC circuits, AC circuits and sinusoidal steady-state analysis, phasor diagrams, three-phase circuits, types of electrical machines, construction and principle of operation of electrical machines, and Advantages and disadvantages of electrical machines.

Academic Year 3 / Level 6

Course Code	Course Name	Course Description
IE332	Manufacturing Systems	Covers the definition and classification of manufacturing systems; Manufacturing automation fundamentals; Manufacturing strategies (lean manufacturing, agile manufacturing and Application of Knowledge-Based-Systems in manufacturing); performance of manufacturing system; Modeling of manufacturing systems; High volume manufacturing systems design and analysis; Flexible manufacturing performance analysis; automated inspection analyses
IE361	Safety Engineering	This course will provide students with tools and guidelines to become safety engineers or managers in real-world industries. It emphasizes on national and international safety regulations and standards, industrial hazard avoidance concepts and techniques, accident losses and its effect on organizations and the national economy, workers' compensation, and developing and maintaining safety programs, plant safety applications, management and its safety responsibilities, and emergency planning.
IE362	Work System Analysis and Design	This course is designed to teach the fundamentals of work study, a key approach in examining various work processes. It begins with an introduction to work study, followed by detailed coverage of problem-solving tools including recording and analysis tools, activity charts, and line balancing. The curriculum includes operation analysis and the principles of manual work design, focusing on motion economy and motion study. Time study is also a major component, where students will learn about performance rating, allowances, and the use of standard data and formulas. The course additionally covers work sampling methods and predetermined time systems, providing students with a comprehensive understanding of work study and its practical application in optimizing work processes.
IE333	Service Operations Analysis	This course explores key concepts and strategies in service operations management. It covers service design, process efficiency, quality control, and customer relationship management in various service sectors like healthcare, hospitality, and finance. Students will learn to analyze and improve service processes through tools such as queuing theory and service blueprinting. Case studies will be used to illustrate real-world applications, preparing students for roles in service management and operations.
IE371	Industrial Information Systems Design	The course explores key aspects of the industrial information systems, it covers industrial information systems planning, project identification and selection, database construction, user interface and report design, and the implementation of human-computer interfaces. Practical exercises, case studies, and real-world projects will allow students to apply their knowledge and skills, equipping them with the expertise needed to tackle information systems challenges within industrial settings.
HR-100	Entrepreneurship	The course covers all concepts related to entrepreneurship and innovation, where the course topics focus on the types of entrepreneurship and the partial and comprehensive system of entrepreneurship, in addition to studying creativity and innovation and studying the characteristics of the creative person, and the factors supporting and hindering creativity. The course also deals with the qualities and skills of the entrepreneur and the intellectual schools of the entrepreneur's traits. In addition to how to transform ideas into projects, the course also deals with the concept of small enterprises, the success and failure of small enterprises, and how to avoid failure, and preparing a business plan for the project.

Academic Year 4 / Level 7

Course Code	Course Name	Course Description
IE441	Operations Research II	This course focuses on advancing students' mathematical understanding of operations research, covering Non-Linear Programming for complex optimization problems, and Dynamic Programming for decision-making in multi-stage processes. The course introduces Waiting Line Models, applying probabilistic concepts to analyze queueing systems. Markov Analysis is also covered, providing insights into stochastic process models. Lastly, students will be introduced to the basic principles of Game Theory, exploring strategic decision-making in mathematical terms. Each topic is presented with a balance of theoretical rigor and approachability, ensuring students comprehend both the mathematical foundations and the conceptual relevance of these advanced operations research techniques. This course advances students' knowledge in operations research, laying the groundwork for application-based courses.
IE451	Design of Experiments	This course provides the mathematical exploration of experimental design principles within the field of industrial engineering. It equips students with the foundational knowledge and mathematical tools required to plan, execute, and analyze experiments in industrial settings. Topics covered include the fundamentals of experimental design, randomized complete block designs, Latin square and Greco-Latin square designs, general factorial designs, 2^k factorial designs, response surface methodology, and robust design. Students will gain proficiency in using mathematical techniques to optimize industrial processes, manage variability, and make data-driven decisions. Through problem-solving assignments, practical projects, and statistical analysis, students will develop the mathematical knowledge needed for effective experimentation and decision-making in the industrial engineering domain.
IE431	Lean Manufacturing and Services	The course aims to provide students with knowledge and practical skills to systematically analyze, develop, evaluate, and deploy technical issues of Lean Manufacturing and Services. Focuses on processes that use less material, require less investment, use less inventory, consume less space, and use fewer people.
IE461	Human Factors Engineering	This course provides an introduction to the principles of HFE and their application to the design of industrial systems. Students will learn about the human body and its limitations, the factors that influence human performance, and the methods used to analyze and design for human interaction with systems.
IE421	Engineering Cost Analysis	Engineering Cost Analysis is an essential course in the Industrial Engineering program, providing an in-depth exploration of cost determination and financial management principles in engineering contexts. It covers the fundamental concepts of cost accounting, estimation, control, and analysis, along with budgeting methods and investment appraisal. Students gain a comprehensive understanding of these techniques and how they are applied in engineering projects. The course emphasizes practical application of cost analysis tools to real-world engineering problems, focusing on analyzing, interpreting, and managing project costs throughout the project lifecycle. Through a blend of lectures, case studies, and practical exercises, it equips future engineers with critical skills for effective financial planning and cost control in engineering practice.

Academic Year 4 / Level 8

Course Code	Course Name	Course Description
IE432	Supply Chain Engineering	This course provides a comprehensive introduction to the field of supply chain engineering, covering the design, analysis, and optimization of supply chains. The course begins with an overview of the supply chain concept and its importance in today's global economy. Students then learn about the different components of a supply chain, including demand management, sourcing, production, logistics, and information systems. The course also covers a variety of modeling and optimization techniques that are used to analyze and improve supply chain performance.
IE471	Industrial Automation and Robotics	The course provides a general view of current methods and tools in automation technologies. It discusses technological aspects for the implementation of automation systems, including digital control, programming logic controllers, communication protocols, and programming industrial robots.
IE452	Industrial Quality Control	Statistical quality control (SQC) is an essential aspect of industrial engineering, enabling the monitoring, evaluation, improvement, and control of product and process quality. This course introduces students to the fundamental principles and techniques of SQC, empowering them to apply statistical methods to ensure product consistency, minimize defects, and achieve continuous process improvement.
IE422	Engineering Project Management	Provides an overview of engineering project management, covering the project life cycle from inception to completion. Includes planning, implementing, and managing projects, with focus on budgeting, scheduling, resource allocation, project network tools, cost optimization, project crashing, time-cost trade-offs, and risk analysis.
IE433	Facilities Planning and Design	This course covers the essentials of facilities planning and design in manufacturing and service industries. It focuses on strategies for site selection, facility layout, space optimization, and the integration of production systems. Students will learn about facility location analysis, material handling, workplace design, and the use of planning tools. The course also touches on environmental and safety considerations in facility design. Through theoretical learning and practical case studies, students will gain skills in creating efficient facility designs that align with business objectives.

Academic Year 5 / Level 9

Course Code	Course Name	Course Description
IE551	Maintenance and Reliability Engineering	The course introduces concepts of reliability and maintenance engineering. Topics include, Reliability characteristics, failure distributions, estimation of system reliability, failure analysis, maintenance workload analysis, maintenance planning, maintenance scheduling, audit and performance measurement of maintenance works, Computerized Maintenance Management Systems (CMMS), Reliability-Centered Maintenance (RCM) and Total Productive Maintenance (TPM).
IE541	Industrial Systems Simulation	This course explores the details of industrial systems simulation, providing students with a thorough understanding of simulation principles and practical experience in applying simulation techniques to solve complex industrial problems. The course starts with a solid foundation in the mathematical principles of simulation, focusing on generating random numbers, probability distributions, and statistical analysis. This theoretical grounding is then applied to practical scenarios using ARENA software, a powerful simulation modeling tool. Students will gain hands-on experience in building, analyzing, and interpreting simulation models, with an emphasis on the role of probability distributions and statistical analysis in effectively representing real-world variability, validating and verifying simulation models, and extracting meaningful insights from simulation output.
IE571	Product Design and Development	This course on Product Design and Development introduces students to essential aspects of the product life cycle, emphasizing 'Design for...' methodologies such as Design for Manufacturing, Design for Assembly, and Design for Environment. It covers the process from concept generation to market launch, integrating principles of engineering with user-centered design and sustainability. Students will engage in quality function deployment, learn about ergonomic design considerations, and apply practical skills in prototyping and testing through hands-on projects. This approach equips them with the knowledge and skills needed for effective and innovative product development in real-world applications.
-	IE ELECTIVE 1	Please refer to the descriptions of the corresponding courses located at the end of this section.
IE591	Capstone Project I	In the Capstone Design Project 1 course, students work in teams to tackle complex engineering challenges, applying industrial engineering principles alongside broader engineering, science, and mathematics concepts. This course focuses on the initial phases of the design process, from problem identification to the evaluation of design alternatives. By the end of the course, students will have generated and assessed multiple design alternatives based on specified criteria, setting the stage for informed decision-making in the subsequent Capstone Design Project 2. Throughout the course, students engage in comprehensive problem identification, employing analysis, synthesis, and brainstorming techniques to develop clear problem statements. Emphasis is placed on addressing technical challenges within the context of diverse stakeholder needs and integrating key constraints with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. The application of engineering knowledge and scientific principles is central to developing solution alternatives that meet specific requirements and adhere to appropriate standards. By the conclusion of Capstone Design Project 1, students will have selected a preliminary design solution for further development. This course not only enhances the students' technical and problem-solving skills but also focuses on developing teamwork, project management, and communication abilities. It also prepares students for the subsequent Capstone Design Project 2, where they will refine and implement their chosen design concept, integrating the comprehensive skills and knowledge they have acquired.

Academic Year 5 / Level 10

Course Code	Course Name	Course Description
IE522	Engineering Professionalism and Ethics	This course introduces students to the fundamental principles and concepts of engineering professionalism and ethics. It explores the ethical responsibilities of engineers in various fields, including their commitment to safety, honesty, environmental protection, and social responsibility. Students will examine real-world case studies and ethical dilemmas to develop critical thinking and decision-making skills in the context of engineering practice. By the end of the course, students will be able to identify, analyze, and address ethical issues that arise in engineering, apply ethical principles to real-world scenarios, and make informed ethical decisions.
IE572	Sustainability Engineering	Sustainability engineering is a course designed to immerse Industrial Engineering students in the principles, indicators, and concepts of sustainability within the engineering domain. It focuses on making students aware of the impacts of unsustainable designs and equips them with the skills to integrate sustainability into engineering practices.
-	IE ELECTIVE 2	Please refer to the descriptions of the corresponding courses located at the end of this section.
-	IE ELECTIVE 3	Please refer to the descriptions of the corresponding courses located at the end of this section.
IE592	Capstone Project II	In Capstone Design Project II, students in the Industrial Engineering program build on their initial design from Capstone Design Project I. This continuation course further develops and refines the selected design, integrating the comprehensive skills and knowledge acquired throughout the program. Students apply advanced problem-solving techniques, manage project execution, and deliver a finalized design that meets project specifications and industry standards. The course emphasizes the practical application of engineering principles, enabling students to showcase their abilities in a professional setting.

University Required Courses (Islamic Cultures)

Course Code	Course Name	Course Description
ISLS100	Islamic Culture (1) (Fundamentals of Islamic Culture)	This course provides a general introduction to Islamic culture, its concept, sources, and characteristics, the achievements of Islamic civilization and its impact on Western civilization, then it addresses the Islamic Creed (Aqidah), its concept, pillars, nullifiers, and the most important contemporary cultural challenges, and concludes by mentioning the most prominent purposes of Sharia and the concept of worship (Al-'Ibadat), its importance and the wisdom of its performance.
ISLS102	Islamic Culture (2) (Studies in the Prophetic Biography)	Defining the concept of the Prophetic biography and its sources, and the stages of his life (may God bless him and grant him peace), his first mission, and events and facts from the Meccan and Medinan era, the first battles, his illness and death, (may God bless him and grant him peace), and his rights (may God bless him and grant him peace) to his community (Al-Ummah).
ISLS109	Islamic Culture (3) (Medical Jurisprudence)	Defining the concept of medical jurisprudence, explaining its importance, its sources, the rule of healing, and the guidance of the Prophet, may God bless him and grant him peace, in treating himself and his policy, the most important medicines mentioned in the Quran and the Hadith, the rule of pharmacy and its provisions, the provisions of the patient, and the general jurisprudential rules and legal purposes related to medical provisions, its meanings and its most important applications, the provisions of medical consent, medical responsibility, its types, its causes, and its exemptions, the provisions of contraception and its regulation, the most important contemporary medical issues, and the provisions related to AIDS patients, human cloning, and organ transplantation.
ISLS104	Islamic Culture (4) (The Family in Islam)	Defining the concept of the family in Muslim society, explaining its status and importance, the foundations on which it is based, strengthening the values and principles on which it is based, discussing the most important family problems, and presenting appropriate solutions to them, while highlighting the wisdom of legislation in each unit of this course.
ISLS105	Islamic Culture (5) (Professional Ethics)	The course deals with the concept of both ethics and the profession and their status, and the conditions of the profession, and presents examples of ethics, including honesty and integrity, sincerity, chastity, justice, good treatment, cooperation, initiative, competence, and mastery, management ethics, professional ethics in Islamic civilization, and means of establishing professional ethics. And legal violations in the profession.
ISLS106	Islamic Culture (6) (Women and their Developmental Role)	Defining the concept of development, its characteristics, the role of women in spiritual and personal development and economic development and its obstacles, and the Kingdom's efforts in supporting the developmental role of women.

ISLS107	Islamic Culture (7) (The Economic System)	This course explores the economic system in Islam, focusing on its origins and objectives. It introduces the doctrinal principles that guide the Islamic economy, encompassing both moral and legislative aspects. Key topics include the fundamentals of the Islamic economic framework, such as concepts of ownership and its various types, economic solidarity, and the principles of Islamic insurance. The course aims to provide students with a comprehensive understanding of how these principles are applied within contemporary economic practices.
ISLS108	Islamic Culture (8) (Contemporary Issues)	This course examines the adolescent stage, focusing on methods for guiding and safeguarding young individuals. It addresses significant challenges encountered by youth and proposes practical solutions. Key topics include the risks associated with smoking and alcohol use, the responsibilities towards one's country, the implications of rebellion against rulers, and the harm caused to innocents. The course also explores the definition of terrorism, its dangers, and its effects. Additionally, discussions will cover advocacy, volunteerism, and the efforts undertaken by the Kingdom in these domains.

University Elective Courses

Course Code	Course Name	Course Description
GNCR103	Kingdom & Its Pioneering Role	This course examines the historical development of the Kingdom of Saudi Arabia, highlighting the contributions of its rulers in political and civilizational development. It focuses on their role in the stewardship of the Two Holy Mosques, their involvement in addressing Arab, Islamic, and international issues, and their efforts towards realizing the Kingdom's Vision 2030.
ARAB-103	Academic Writing Skills	This course explores various patterns of knowledge and rules essential for assessing the understanding of scientific concepts across academic disciplines. It equips students with the skills to document and reinforce the linguistic vocabulary, scientific knowledge, and intellectual insights they have acquired. Additionally, the course aims to enhance students' capabilities in understanding, analyzing, thinking critically, and engaging in scholarly critique.
GNCR104	Physical Fitness and Sports Science	This course focuses on key concepts and practices within physical fitness and sports science. It addresses different types of physical fitness, highlighting their importance, elements, development methods, and measurement techniques. The course also explores the impact of fitness activities on the vital organs. Topics include sports sciences related to healthy nutrition, obesity management, physical activity, and techniques for managing psychological stress.
BIO-104	Sustainable Development	This course introduces the basic principles of sustainable development, including its economic, social, and environmental dimensions. It also examines sustainability within the context of Islamic culture and outlines the goals of sustainable development. The course further includes a discussion on the strategic plans and indicators of sustainable development in the Kingdom of Saudi Arabia, featuring selected models from the Kingdom's Vision 2030.
CUET-101	Lifelong Learning Skills	This course explores the concept of lifelong learning by covering its nature, importance, and the essential skills required. It reviews the theoretical foundations, various models, and practical applications of lifelong learning. Additionally, the course highlights the characteristics of learners in the digital age, focusing on how lifelong learning strategies can be adapted to contemporary educational needs.

Program Elective Courses

Course Code	Course Name	Course Description
IE512	Feasibility Study	The course introduces students to how feasibility studies are conceived, conducted, and appraised, covering marketing, technical, financial, legal, organizational, and environmental and national impact studies.
IE552	Computational Methods in Industrial Engineering	This course gives students an explores the design and implementation of decision support systems (DSS) using MATLAB program, Excel, and VBA. The following topics are covered: Excel basics & formatting; referencing & names for cells, worksheets, and workbooks; R1C1 notation; functions & formulas; auditing; creating charts & sparklines; chart tools; pivot tables & charts; performing statistical analysis & solving mathematical models using MATLAB; solving engineering formula, Excel; working with large data in Excel; Visual Basic environment; recording macros; properties, methods, referencing & formulas in VBA; objects & variables; sub & function procedures; programming structures; arrays; debugging; creating user interface; DSS development process; graphical user interface design; case studies in DSS.
IE542	Decision Analysis	The course aims to build the students' ability to understand the principles of decision-making and methods for decision analysis under uncertainty to apply them in industrial areas. It creates an understanding to appreciate the use of expert judgment and the value of information in decision-making and risk management. It is a design function to consider constraints, Solutions, and analysis of decision problems.
IE543	Network Optimization	This course is a continuation of the operations research courses. In this course, students will learn deep industrial network analysis using network techniques and its applications.
IE544	Queuing Systems	The course introduces students to "Queuing System" characteristic and notation, birth-death Markovian models, single and multiple servers, advanced Markovian models and their issues, non-Markovian models, queuing networks, the measure of effectiveness and optimization problems in queuing and solving case studies using numerical and simulation techniques.
IE573	Additive Manufacturing	This course introduces 3D printing technologies including history and basics of 3D printing, currently available 3D printing methods and printable materials as well as current and emerging applications of 3D printing. The course will be composed of a lecture and a laboratory session, during which students will create a 3D design and print a functional prototype to discover for themselves the potential and limitations of 3D Printing. The students will learn how to be "makers" by using various types of 3D modeling software and imaging equipment, printing actual physical objects that they have designed and modeled themselves, and participating in educational outreach in the university and the community.
IE574	Computer Aided Manufacturing and Design	Computer-aided manufacturing/design focuses to introduce the modern computer-aided manufacturing technologies about the use of computers for design and manufacturing, including the theory of computer numerical control (CNC) as well as the related computer-aided geometric modeling methods. Students will develop practical knowledge and understanding of the applications, underlying mathematical principles, and limitations of these technologies through lectures and laboratory tutorials/projects. Also, students will practice the skills of the computer-integrated manufacturing components such as: CAD/CAM/CIM by software CAM concept, and programming the machine tool (G-Code) using a CNC machine.

Course Code	Course Name	Course Description
IE531	Enterprise Resource Planning	This course provides students with the fundamentals of enterprise resource planning (ERP) systems concepts, the importance of integrated information systems in an organization, Marketing Information Systems and the Sales Order Process, Production and Materials Management, Customer Relationship Management, and Human Resources Processes with ERP.
IE575	Healthcare System Engineering	This course develops a basic understanding of the quantitative tools used in performing system analyzes and decision-making in a healthcare context. It is the study of applying industrial engineering and operations research methods to model, analyze, and improve healthcare systems. Lean and Six Sigma study for continuous improvement of healthcare systems. Explore common issues related to decision-making and optimization in healthcare including scheduling and capacity planning. Health policy examination, data analysis and healthcare information technology.
IE553	Quality Management Systems	The main idea of this course is to introduce students to the basic principles of concepts, tools, and techniques used in total quality management, quality cultures, effective team structures, quality measurement, productivity, and competitiveness in an industrial environment. As well as emphasizing the interdependence of leadership, relationships between suppliers and customers, employee involvement, data collection and analysis, productivity, statistical process control, and other issues with quality and customer satisfaction. Students gain hands-on experience with basic quality decision-making and troubleshooting techniques.
IE554	Introduction to Applied Data Analytics	This course aims to develop a basic understanding of data science technologies and their applications, as well as the fundamental principles of data mining. It provides an overview of the data-driven approach and the data analytics life cycle, with an emphasis on basic statistics, programming, and SQL. Students will be introduced to data acquisition, cleaning, processing, and pre-processing, as well as exploratory data analysis and visualization. They will also have the opportunity to implement and validate linear and penal regression, basic classification, and basic grouping methods. Additionally, an introduction to big data analysis will also be covered in this course, highlighting the concepts, implementation techniques, and applications of data mining.
IE561	Occupational Health and Safety	This course provides students with the fundamentals of occupational health and safety (OHS), hazard recognition, assessment and control techniques (physical, chemical, biological, ergonomic, and psychosocial), in the context of federal and provincial occupational health and safety legislation. Current issues in OHS and Environment.
IE532	Material Handling Systems and Logistics	The student will be introduced to material handling and packaging. Plant layout and material handling. Types of material handling equipment and their economics. Conveyors, overhead lifting, cranes, and hoists. Role of packaging in material handling. Management of the packaging function.
IE523	Introduction to Finance and Asset Management	In this course, students will learn the concepts and analytical techniques of investment and financing decisions with the ultimate goal of maximizing the wealth of shareholders. It covers the concepts of time value of money, asset valuation, risk and return paradigm, capital budgeting, financing, and payout decisions.

9. APPENDIX A: REGULATIONS AND GUIDES

1. **Study and Examinations Regulations**
    - This document outlines the regulations and executive rules related to study and examinations at Northern Border University. It includes definitions, objectives, academic systems, admission procedures, academic actions, transfer and equivalency, visiting and student exchange, examinations, and grading. The document also provides guidance on graduation and learning outcomes. To read the full document, click on the following link: **1_Study and Examinations Regulations**

2. **Code of Conduct and Discipline**
    - This document sets forth the standards for student conduct and discipline within the university. It details the rules governing student behavior, the disciplinary procedures for violations, and the responsibilities of both students and the university in maintaining a respectful and safe academic environment. To read the full document, click on the following link: **2_Code of Conduct and Discipline**

3. **Guide to Academic Terms**
    - This guide explains the academic terms used within Northern Border University, providing clear definitions for key concepts such as academic records, warning, semester GPA, and cumulative GPA. It is an essential reference for understanding the academic policies and requirements of the university. To read the full document, click on the following link: **3_Guide to Academic Terms**

4. **Guide to Academic Services on the Banner System**
    - This guide provides instructions on how to use the Banner System for accessing various academic services. It covers services such as semester postponement, course withdrawal, IBAN modification, re-enrollment, and internal transfer between colleges. The guide is designed to help students navigate and utilize these electronic services effectively. To read the full document, click on the following link: **4_Guide to Academic Services on the Banner System**

5. **Student Rewards Guide**
    - This document describes the various student reward programs available at the university, including financial rewards for academic excellence and other forms of recognition. It outlines eligibility criteria, application processes, and the types of rewards that students can receive. To read the full document, click on the following link: **5_Student Rewards Guide**

6. **Academic Advising Guide**
    - This guide provides comprehensive information about the academic advising system at the university. It includes the roles and responsibilities of academic advisors, advising procedures, and the support available to students for achieving their academic goals. The guide emphasizes the importance of advising in enhancing student success. To read the full document, click on the following link: **6_Academic Advising Guide**

7. **Library Deanship Introduction Brochure**
    - This brochure provides an overview of the services and resources offered by the Library Deanship at Northern Border University. It includes information about the library's facilities, online resources, and support services available to students and faculty. To read the full document, click on the following link: **7_Library Deanship Introduction Brochure**

8. **Student Rights and Responsibilities**
    - This document outlines the rights and responsibilities of students at Northern Border University. It covers topics such as academic integrity, access to resources, and the expectations for student conduct and participation in university activities. To read the full document, click on the following link: **8_Student Rights and Responsibilities**

9. **Guide to Activating Special Needs Services on Blackboard Ally**
    - This guide provides instructions for students with special needs on how to use Blackboard Ally to access course materials in alternative formats. It aims to improve accessibility and enhance the learning experience for students requiring accommodation. To read the full document, click on the following link: **9_Blackboard Ally**

10. **Guide to Electronic Services**
    - This guide details the electronic services available to students at Northern Border University, including email, online course registration, and access to digital resources. It provides step-by-step instructions for using these services effectively. To read the full document, click on the following link: **10_Guide to Electronic Services**

11. **Guide to Health Services**
    - This document provides information about the health services available to students at the university, including medical care, counseling services, and wellness programs. It outlines how to access these services and what support is offered. To read the full document, click on the following link: **11_Guide to Health Services**

12. SafeAssign User Guide for Verifying the Authenticity of Assignments

- This guide explains how to use SafeAssign, a tool for checking the originality of assignments and research papers submitted by students. It provides instructions on how to submit work and interpret the similarity reports generated by the tool. To read the full document, click on the following link: **12_SafeAssign User Guide**

13. Guide to the Northern Pioneers Center

- This guide introduces the Northern Pioneers Center, highlighting its mission to support innovation and entrepreneurship among students. It describes the resources and programs available to help students develop their business ideas and projects. To read the full document, click on the following link:**13_Guide to the Northern Pioneers Center**

14. Guide to the Digital Library Unit

- This guide provides an overview of the Digital Library Unit, detailing the digital resources and services offered to support students and faculty in their research and academic work. It includes information on accessing e-books, journals, and databases. To read the full document, click on the following link: **14_Guide to the Digital Library Unit**

15. Student Fund

- This document outlines the purpose and operation of the Student Fund, which provides financial support to students in need. It explains eligibility criteria, the application process, and the types of assistance available. To read the full document, click on the following link: **15_Student Fund**

16. Research Ethics Policy at Northern Border University

- This policy outlines the university's commitment to promoting ethical research practices that align with Islamic Sharia, legal regulations, and international best practices. The policy emphasizes the importance of integrity, honesty, and transparency in research, while also ensuring the safety and well-being of all involved parties, including researchers, participants, and the community. The policy covers various aspects of research ethics, such as informed consent, confidentiality, data management, authorship, and conflict of interest. It also establishes a framework for addressing ethical violations and promoting a culture of ethical research within the university. The policy serves as a guide for researchers, faculty members, and students to conduct research responsibly and ethically, contributing to the advancement of knowledge while upholding the highest standards of integrity and respect for all individuals and communities involved. To read the full document, click on the following link:**16_Research Ethics Policy.**

17. Policies of the Deanship of E-Learning and Distance Education

- This document details the policies governing e-learning and distance education at Northern Border University. It includes guidelines on the use of e-learning platforms, student responsibilities in online courses, assessment methods, and quality assurance measures to ensure effective and efficient online education. **Click here to read the document.**

18. E-Learning Regulations

- This document outlines the regulations for e-learning at Northern Border University, focusing on the structure, delivery, and management of online courses. It covers the roles and responsibilities of students and faculty, technology requirements, and strategies for maintaining academic integrity in a virtual environment. **Click here to read the document.**

19. Library Regulations and Knowledge Sources

- This document provides information about the regulations governing the use of library resources and services at Northern Border University. It includes policies on library access, borrowing privileges, use of digital resources, and guidelines for maintaining a conducive learning environment**. Click here to read the document.**

10. APPENDIX B: STUDENT FORMS

1. **Re-enrollment Form**
    - This form is used by students who wish to apply for re-enrollment at Northern Border University after an interruption in their studies. It outlines the conditions and steps required for re-enrollment, including eligibility criteria and the necessary approvals from the university administration. To download the form, click on the following link: **1_Re-enrollment Form**

2. **Equivalent Courses Form (Old and New Plans)**
    - This form facilitates the mapping of courses between old and new academic plans for students who are transitioning between study plans. It allows for the identification of equivalent courses, ensuring that credits are appropriately transferred and recognized. To download the form, click on the following link: **2_Equivalent Courses Form**

3. **Visiting Student Form (External University)**
    - This form is intended for students who wish to study temporarily at another university as a visiting student. It requires details about the host institution and the courses to be taken, along with approvals from both the home and host universities. To download the form, click on the following link: **3_Visiting Student**

4. **Request for Duplicate or Replacement Document**
    - This form is for students who need to request a duplicate or replacement of official university documents, such as diplomas or transcripts. It includes the required documentation and fees associated with obtaining replacements. To download the form, click on the following link: **4_Request for Duplicate**

5. **Transfer from Northern Border University to Another University**
    - This form allows students to initiate a transfer from Northern Border University to another university. It outlines the conditions and processes required for a successful transfer, including the necessary approvals from university authorities. To download the form, click on the following link: **5_Transfer from NBU to Another University**

6. **File Withdrawal and Clearance**
    - This form is used by students who wish to withdraw from the university permanently. It includes a checklist for completing the clearance process, ensuring that all academic and financial obligations are fulfilled before leaving the university. To download the form, click on the following link: **6_File Withdrawal and Clearance**

11. APPENDIX C: ROLE OF STUDENT FEEDBACK IN PROGRAM IMPROVEMENT

The Industrial Engineering Program actively engages students through various surveys to assess and enhance different facets of the educational experience. Each of these surveys is designed to capture detailed feedback on specific aspects of the educational and campus experience, allowing the Industrial Engineering Program to make informed improvements that enhance student satisfaction and program effectiveness.

A. KEY STUDENT SURVEYS

Your active participation in these surveys is crucial. By providing honest and thoughtful feedback, you play a vital role in enhancing the learning environment and strengthening the Industrial Engineering program. Your input is valued, and the industrial engineering program is dedicated to listening and responding to your needs. Below are the key surveys conducted:

1. Student Course Evaluation Survey (CES)

This survey focuses on specific aspects of course design, delivery, and support. It evaluates the clarity of course objectives, the alignment of course activities with these objectives, how well instructors deliver and manage the course, and the adequacy of resources provided. Students are asked about their perception of the instructor's knowledge, enthusiasm, and the helpfulness of the course materials. This survey aims to collect actionable feedback to improve course content, teaching methods, and overall student satisfaction with individual courses.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: **Student_Course Evaluation Survey (CES)**

2. Student Assessment of Learning Resources Survey

This survey measures students' access to and satisfaction with learning resources, including the university library and online materials. It covers the ease of access to these resources, the adequacy and currency of materials provided, and the effectiveness of library staff and training programs. The survey aims to ensure that learning resources are sufficient, up-to-date, and effectively support students' academic needs, thereby enhancing their learning experience.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: Student_Assessment_of_Learning Resources Survey

3. Student Assessment of Program Quality Survey

This survey gathers feedback on the overall quality and effectiveness of the Industrial Engineering program. It addresses the clarity of program goals, the relevance of the skills taught to current job market trends, the success in achieving learning outcomes, and the support provided for academic and career planning. Feedback is also sought on how well the program responds to student suggestions and the perceived improvements made over time. The goal is to continuously refine the program to meet student needs and industry standards.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: **Student_Assessment_of_Program Quality Survey**

4. Student Assessment of Health and Safety Survey

This survey focuses on health and safety standards across the campus, including compliance with safety regulations, clarity of safety policies, the availability of safety equipment, and training for emergencies. It aims to assess and enhance the safety culture on campus, ensuring that all safety measures are effectively communicated and implemented to maintain a safe learning environment.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: **Student_Assessment_of_Health_and Safety Survey**

5. Student Experience Survey (SES)

The SES is designed for more senior students (4th and 5th year) and covers a wide range of aspects concerning student life and services. It assesses the availability of information about the institution, the helpfulness of orientation programs, the adequacy of academic advice, and the quality and accessibility of learning and teaching facilities. It also evaluates the availability of extracurricular and religious facilities. The feedback from this survey is used to improve the quality of life and academic support for students, ensuring a fulfilling university experience.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: **Student_Experience Survey (SES)**

6. Student Graduating Survey (PLOs Assessment)

This survey is aimed at graduating students, assessing their attainment of the Program Learning Outcomes (PLOs). It evaluates students' understanding and application of engineering principles, their ability to solve complex problems, design solutions considering various factors, communicate effectively, and work collaboratively in teams. Feedback from this survey is crucial for assessing the effectiveness of the educational program in preparing students for professional success and for making necessary adjustments to the curriculum.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: **Student_Graduating Student Survey (PLOs Assessment)**

7. Student Program Evaluation Survey (PES)

Targeted at students in their final year, this survey evaluates the overall satisfaction with the program, covering aspects such as academic and career counseling, instructor support, resource availability, and the relevance of the education to their future careers. It also assesses the effectiveness of field experiences and technology usage in enhancing learning. The goal is to gather insights that help in continuously improving the program to better meet students' needs and industry demands.

Access Survey: To review the content of this survey or discuss any questions in it with the academic advisor, please click on the following link: **Student_Program Evaluation Survey (PES)**

Additional Notes:

- A course-specific survey assessing learning outcomes is also distributed by faculty at the end of each course, though it is not included in this appendix.
- The CES, SES, and PES are completed by students through the Banner system.

B. FEEDBACK LOOP AND CONTINUOUS IMPROVEMENT

When you participate in surveys, you are doing more than just answering questions — you are actively shaping the future of the Industrial Engineering program. Here is a closer look at how your feedback leads to tangible changes:

1. Analysis of Feedback

- What Happens: We gather all the responses from the surveys and break them down to understand what you and your peers appreciate and what you think could be better. This analysis helps us identify strong points that need to be maintained and specific areas where we can make improvements.
- Your Impact: Your honest feedback helps highlight what works well and what does not, guiding us to focus our efforts where they are needed most.

2. Action Planning

- What Happens: Based on what we learn from your feedback, we develop a plan of action. This might involve redesigning a course, updating resource materials, enhancing facilities, or even revising support services.
- Your Impact: The suggestions you provide can lead to real changes. For instance, if many students feel a course could use more practical examples, we might adjust the curriculum to include more case studies or hands-on projects.

3. Implementation of Changes

- What Happens: We put our plans into action. This could be anything from training our faculty with new teaching techniques to upgrading the technology in our labs.
- Your Impact: By noting what needs improvement, you can see these changes implemented during your time at the university or for future students. Your feedback directly influences how we teach, support, and provide for our student community.

4. Review and Reassessment

- What Happens: After implementing changes, we do not just assume everything is fixed. We revisit the altered areas to see if the changes have effectively addressed the concerns. This may involve follow-up surveys or other forms of feedback to evaluate the impact of the modifications.
- Your Impact: Your continued engagement in providing feedback helps us refine and perfect our approaches. It is an ongoing conversation — as the needs and expectations of students evolve, so does our program.