



## Electrical and Renewable Energy Engineering Program

### Course Specification - (2025-2026)

#### Quality Systems and Assurance – MPE474

|               |           |          |      |
|---------------|-----------|----------|------|
| Academic Year | 2025/2026 | Semester | Fall |
|---------------|-----------|----------|------|

#### 1. Basic Information

|                                                                      |                                                                              |               |                 |           |       |
|----------------------------------------------------------------------|------------------------------------------------------------------------------|---------------|-----------------|-----------|-------|
| Course Title (according to the bylaw)                                | Quality Systems and Assurance                                                |               |                 |           |       |
| Course Code (according to the bylaw)                                 | MPE474                                                                       |               |                 |           |       |
| Prerequisite:                                                        | Probability and statistics – BAS122                                          |               |                 |           |       |
| Department/s participating in delivery of the course                 | Electrical and Renewable Energy Engineering                                  |               |                 |           |       |
| Number of credit hours/points of the course (according to the bylaw) | Credit Hours                                                                 | Contact Hours |                 |           |       |
|                                                                      |                                                                              | Lecture       | Tutorial        | Practical | Total |
|                                                                      | 3                                                                            | 2             | 2               | 0         | 4     |
| Course Type                                                          | Elective - Minor Requirements of Electrical and Renewable Energy Engineering |               |                 |           |       |
| Academic level at which the course is taught                         | Fifth Level                                                                  |               |                 |           |       |
| Academic Program                                                     | Bachelor of Engineering of Electrical and Renewable Energy                   |               |                 |           |       |
| Faculty/Institute                                                    | Faculty of Engineering                                                       |               |                 |           |       |
| University/Academy                                                   | Nahda University                                                             |               |                 |           |       |
| Name of Course Coordinator                                           | Dr. Hassan Moh. Mahmoud                                                      |               |                 |           |       |
| Course Specification Approval:                                       | Department council                                                           |               | Faculty council |           |       |
| Date of Approval of the course Specification:                        | 13 / 9 / 2025                                                                |               | 16 / 9 / 2025   |           |       |



## 2. Course Overview

Basic concepts, Definitions, Terminology, and Development of quality control systems Quality systems for: design, development, purchasing, and Planning, Quality organization, Cost of quality, Economics of quality, Training, Quality Management Systems, Quality assurance, Employee participation programs.

## 3. Course Learning Outcomes CLOs

### Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                              | Course Learning Outcomes<br>Upon completion of the course, the student will be able to: |                                                                                                                                                                            |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code                                                                          | Text                                                                                                                                                                                                                                                                                                                                                         | Code                                                                                    | Text                                                                                                                                                                       |
| A2                                                                            | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                            | CLO2.1                                                                                  | Analyze quality-related data using statistical methods such as control charts, process capability analysis, and acceptance sampling.                                       |
| A3                                                                            | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the Electrical and Renewable Energy Engineering Program and within the principles and contexts of sustainable design and development. | CLO3.1                                                                                  | Apply engineering design processes to develop solutions that meet specified technical requirements.                                                                        |
|                                                                               |                                                                                                                                                                                                                                                                                                                                                              | CLO3.2                                                                                  | Evaluate engineering solutions within the principles of sustainable design and development.                                                                                |
| A4                                                                            | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                 | CLO4.1                                                                                  | Utilize contemporary technologies and tools for monitoring and controlling environmental parameters such as temperature, humidity, ventilation, lighting, and air quality. |



| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                                          | Course Learning Outcomes<br>Upon completion of the course, the student will be able to: |                                                                                                                                          |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Code                                                                          | Text                                                                                                                     | Code                                                                                    | Text                                                                                                                                     |
| A6                                                                            | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements. | CLO6.1                                                                                  | Plan quality assurance activities for engineering projects in accordance with project requirements, schedules, and resource constraints. |
|                                                                               |                                                                                                                          | CLO6.2                                                                                  | Recommend corrective and preventive actions to improve project quality, efficiency, and compliance during implementation.                |

#### 4. Teaching and Learning Methods

1. Interactive Lectures
2. Self-Learning
3. Discussion
4. Tutorials
5. Report and research

#### Course Schedule

| Number of the Week | Scientific content of the course<br>(Course Topics)                                                                              | Total Weekly Hours | Expected number of the Learning Hours |                |                 |                                     |               |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------------|-----------------|-------------------------------------|---------------|
|                    |                                                                                                                                  |                    | Lecture Hours                         | Tutorial Hours | Practical Hours | Self-learning (Assignments/Project) | Other         |
| 1                  | Basic concepts, Definitions, Terminology,                                                                                        | 7                  | 2                                     | 2              | 0               | 3                                   | -             |
| 2                  | Basic concepts, Definitions, Terminology,                                                                                        | 7                  | 2                                     | 2              | 0               | 3                                   | -             |
| 3                  | Development of quality control systems Quality systems                                                                           | 7                  | 2                                     | 2              | 0               | 3                                   | -             |
| 4                  | Development of quality control systems Quality systems                                                                           | 7                  | 2                                     | 2              | 0               | 3                                   | -             |
| 5                  | Development of quality control systems Quality systems for: design, development, purchasing, and Planning, Quality organization, | 9                  | 2                                     | 2              | 0               | 3                                   | Quiz 1 (2 Hr) |



|    |                                                                                                                          |   |   |   |   |   |               |
|----|--------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---------------|
| 6  | Broad overview of fundamental and applied concepts of energy in the overall context of the modern .and built environment | 7 | 2 | 2 | 0 | 3 | -             |
| 7  | Mid Term Exam                                                                                                            |   |   |   |   |   |               |
| 8  | Broad overview of fundamental and applied concepts of energy in the overall context of the modern .and built environment | 7 | 2 | 2 | 0 | 3 | -             |
| 9  | Cost of quality, Economics of quality, Training,                                                                         | 7 | 2 | 2 | 0 | 3 | -             |
| 10 | Cost of quality, Economics of quality, Training,                                                                         | 9 | 2 | 2 | 0 | 3 | Quiz 2 (2 Hr) |
| 11 | Quality Management Systems,                                                                                              | 7 | 2 | 2 | 0 | 3 | -             |
| 12 | Quality assurance,                                                                                                       | 7 | 2 | 2 | 0 | 3 | -             |
| 13 | Employee participation programs.                                                                                         | 7 | 2 | 2 | 0 | 3 | -             |
| 14 | Employee participation programs.                                                                                         | 7 | 2 | 2 | 0 | 3 | -             |
| 15 | Revision                                                                                                                 | 7 | 2 | 2 | 0 | 3 | -             |
| 16 | Final Term Exam                                                                                                          |   |   |   |   |   |               |

## 5. Methods of students' assessment

| No. | Assessment Methods *  | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-----------------------|---------------------------------|---------------|----------------------------------|
| 1   | Mid-term written Exam | 7                               | 20            | 20%                              |
| 2   | Final Written Exam    | 16                              | 40            | 40%                              |
| 3   | Assignments           | 2-14                            | 10            | 10%                              |
| 4   | Quizzes               | 5,10                            | 20            | 20%                              |
| 5   | Report                | 12                              | 10            | 10%                              |

## 6. Learning Resources and Supportive Facilities

|                                                           |                                               |                                                                                                                                           |
|-----------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) * | The main (essential) reference for the course | Oakland, J. S., Oakland, R. J., and Turner, M. A., Total Quality Management and Operational Excellence: Text with Cases, Routledge, 2021. |
|                                                           | Other References                              | Montgomery, D. C., Introduction to Statistical Quality Control, 8th ed., Wiley, (2022)                                                    |
|                                                           | Electronic Sources                            | www.ekb.eg                                                                                                                                |
|                                                           | Learning Platforms                            | https://lms.nub.edu.eg/login/index.php                                                                                                    |



|                                                             |                         |                                   |
|-------------------------------------------------------------|-------------------------|-----------------------------------|
| Supportive facilities & equipment for teaching and learning | Devices/Instruments     | Data Show                         |
|                                                             | Supplies                | White Board                       |
|                                                             | Electronic Programs     | MATLAB Programs                   |
|                                                             | Skill Labs/ Simulators  | –                                 |
|                                                             | Virtual Labs            | –                                 |
|                                                             | Other (to be mentioned) | Lecture Hall and Laboratory Usage |

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