MANSOURA UNIVERSITY

The Future Is Yours

# AI Engineering Program - AIE

## Artificial Intelligence Engineering

## Student Guide

Faculty of engineering

# Chapter One:

## Regulations

It was approved in the unified regulations for bachelor's programs with credit hour system in (2020) by Ministerial Resolution No. (3967) dated 27/9/2020

# First: Introduction

Due to the great scientific development and the collaboration among many majors within one faculty or across many faculties in the university, the university's strategy has headed towards introducing many new programs based on a combination of different majors that adhere to technological changes, scientific development and meet labor market needs. Besides, these programs were designed based on the credit hour system in order to be compatible with National Authority of Quality Assurance and Education Accreditation Standards, the governing standards for an educational product in line with international educational standards, the Academic Standards *NARS2018* and the Engineering Sector Reference Framework 2020 which provides flexibility for learners, and facilitates adopting study plans that correspond to the above mentioned changing attributes.

# Second: General Rules

## Article [1]: Granting Academic Degrees

Based on Faculty of Engineering Council request, Mansoura University grants a bachelor's degree in one of the following majors:

1. Biomedical Engineering
2. Communication and Computer Engineering
3. Mechatronics Engineering
4. Building and Construction Engineering
5. Chemical and Environmental Engineering
6. Renewable and Sustainable energy Engineering
7. Infrastructure and Environmental Engineering
8. Sustainable Architecture Engineering
9. Sustainable Water Engineering
10. Structural Engineering Program
11. Materials Engineering for Advanced Technology
12. Artificial Intelligent Engineering

Students are stipulated to complete the academic requirements necessary for one of these programs to obtain a B.Sc. degree in the required major. Study in these programs should take place in English within each specialization scope

based on the credit hour system. Further, students should be aware of the requirements and regulations of each program and should be responsible for achieving them.

## Article [2]: The Program Study System

The study system used in these programs is the American system of credit hours within the context of one semester.

## Article [3]: The Credit Hour Standard According to the Reference Framework 2020

1. With regard to theoretical lectures:
   One credit hour is calculated for everyone hour per week lecture during one semester.
2. For practical lessons and practical exercises:
   One credit hour is calculated for each 2-3-hour workshop or exercises per semester.

## Article [4]: The Academic Council

The Program Management Academic Council shall be formed by a decision from the University President based upon the Faculty Council nomination for two-year-period headed by Faculty Dean and the membership of:

1. Vice Dean of Education and Student Affairs.
2. Heads of Scientific Departments concerned with the program.
3. Program Executive Director.
4. Professor or assistant professor from the specialized scientific departments nominated by the Dean after taking the opinion of the Head of the department and it is permissible in special cases to include two lecturers at most to the membership of the council.
5. Two experienced members either internal or external.

The academic council of the program will perform all the duties of the faculty scientific departments with respect to education and students' affairs. Further, the academic council shall observe the following criteria with regard to assigning teaching duties to staff members:

1. Scientific departments nominations based on their specialty.
2. Students' surveys on the previous times the course was taught.
3. The program management opinion according to performance evaluation and follow-up.

## Article [5]: The Program Executive Director

For each program, an executive director shall be appointed by the University President, after a nomination by the Faculty Dean provided that he is one of the faculty members specialized in the field(s) of the program with associate / full professorship degree, for a minimum of two calendar years, renewable under the same conditions of the first appointment.

The executive director of the program shall perform the following tasks:

1. Implementing the program's internal regulation.
2. Coordination between the scientific departments in assigning teaching duties to faculty members.
3. Supervising students' academic registration.
4. Supervising the administrative work by the program staff.
5. Supervising the regularity of academic counseling in the program.
6. Following up the educational process regularity in accordance with the approved study schedules.
7. Supervising and regulating end-of-term and mid-term exams (if any).
8. Supervising field training and forming partnerships with distinguished training authorities.
9. Carrying out the secretariat of the council in the subcommittee of the academic council.
10. Organizing and supervising the program scientific conference.
11. Preparing the forms related to the financial duties in the program and submitting them to the higher management of the college.
12. Overseeing the development of the program's infrastructure, including runways, lecture halls, exercise halls, school laboratories and equipment.
13. Supervising the fulfillment of all quality assurance requirements in accordance with the standards of the National Authority for Accreditation and Quality Assurance of Education.
14. Preparing the annual self-study for the program to be presented to the Project Management Unit in the Ministry of Higher Education and Scientific Research.

## Article [6]: Programs Coordinator for Digital Transformation

A programs coordinator for digital transformation is appointed by the Dean of the faculty after a nomination by the Faculty Vice Dean of student affairs (if three or more programs are available in the faculty) from the (associate) professors at the faculty having experience working with the credit hours'

system and the programs for a period of two years' renewable with the same conditions of the first appointment.

The programs coordinator for digital transformation duties are:

1. Reviewing and auditing student registrations for all programs after approval of the relevant councils.
2. Reviewing the control works and fulfilling the final control stages after approval of the relevant councils.
3. Supervising the financial page follow-up for program students.
4. Reviewing the quality assurance work in the programs.

## Article [7]: Registration Requirements and Entry Requirements

The student's registration for the bachelor's degree in these programs is required in addition to the general conditions stipulated in the executive regulations (Article 75) of the Universities Organizing Law as follows:

1. The student meets the admission requirements determined by the Supreme Council of Universities.
2. The student must have a high school completion certificate or its equivalent where major is in Mathematics.
3. The student fulfills the internal rules approved by the Faculty Board regarding the admission of students to these programs.

## Article [8]: Transfer Conditions (change of course) and Re-enrollment

If the transfer is within the faculty, the transfer can occur before the start of the main semesters via approved rules by the faculty council and applied by the faculty representative for education and students affairs; while if the transfer is from another faculty within the university or from another university, the transfer is only through the central remittance office. At the beginning of the academic year, a student budget is made according to Table (1).

**Table (1): The Symbol and Grade Corresponding to Assessment Obtained Degree by the Student when Converting from the Semester System to the Credit Hour System.**

| The percentage obtained by the student | Number of points | Estimate |
|---|---|---|
| Less than 50% (Failed) | 00.0 | F |
| 40% to less than 50% (successful by clemency rules) | 1.00 | D |
| 50% to less than 55% | 1.00 | D |
| 55% to less than 60% | 1.30 | D+ |
| 60% to less than 65% | 1.70 | C- |
| 65% to less than 68% | 2.00 | C |
| 68% to less than 71% | 2.30 | C- |
| 71% to less than 75% | 2.70 | B+ |

| | | |
|---|---|---|
| 75% to less than 80% | 3.00 | B |
| 80% to less than 85% | 3.30 | B+ |
| 85% to less than 90% | 3.70 | A- |
| 90% to less than 95% | 4.00 | A |
| 95% to 100% | 4.00 | A+ |

1. Transferring students who wish to enroll in one of the accredited programs specializations must have completed level (000) courses with an average grade of no less than 2,00 (maximum grade 4,00), and according to the rules determined by the faculty council and approved by the university council, based on the available capacity of the program.
2. Students who are transferred from the regular stream may be admitted to the same faculty, according to conditions determined by the Faculty Council and approved by the University Council based on the program's available capacity.
3. Students who have already spent two years in five years studying colleges outside of Faculty of Engineering, Mansoura University, and wish to join the program should submit a case statement from the faculty in which they were enrolled stating the degrees they have obtained and whether they have obtained credit hours or not.
4. It is permissible to accept international students who have obtained a high school diploma or its equivalent in every academic year according to the order of their degrees according to the nominations received by the Faculty from the General Administration of International Students. Then, the faculty council undertakes a proposal in exchange for the cost of educational services other than the university fees prescribed for these students.
5. Students, who have previously left studying in the program for a period of up to four semesters at a maximum and who have already received high estimates in the period they spent, may re-register for the program if they wish to do so, after the approval of the relevant academic council and in accordance with the rules for regular study [11].

## Article [9]: Obtaining the Degree Requirements

In order for the student to obtain a bachelor's degree in the aforementioned programs, Article [1]:

1. The student must successfully pass at least (160 credit hours).
2. The student must pass the graduation project.
3. The student must pass courses where the evaluation is Pass / Fail and does not count towards the student GPA such as summer training.

4. The distribution of subjects that are included in the study program for graduation requirements should be as follows:

**Table (2) Distribution of the program hours to graduation requirements**

| Specialized Groups | Min % | Max% |
|---|---|---|
| University Requirements | 8% | - |
| Faculty Requirements | 20% | - |
| General Major Requirements | 35% | - |
| Accurate Specialization Requirements | - | 28% |

Taking into account that the academic plans for each program achieve the courses and the indicative proportions set by the National Authority for Quality Assurance of Education, which includes the following curricula:

1. Social and Human Sciences
2. Business Administration
3. Mathematics and Basic Sciences
4. Engineering culture
5. Basic Engineering Sciences
6. Engineering and design applications
7. Project and field training

## Article [10] Participating Scientific Departments

The academic council supervises, for each program, teaching of all the courses of the subprograms that follow it, including humanities, Arabic language and technical reports. The scientific departments assign teaching duties of the various courses after being approved by the faculty council. Teaching should be conducted through the following scientific departments, each in the scope of its major:

1. Electronics and Communications Engineering Department.
2. Computer Engineering and Control Systems Department.
3. Production Engineering and Mechanical Design Department.
4. Electrical Engineering Department.
5. power mechanical engineering Department.
6. Mathematics and Engineering Physics Department.
7. Structural Engineering Department - Public Works Department - Irrigation and Hydraulics Department.
8. Architecture Department.
9. External departments in the field of anatomy, physiology and public health from the Faculty of Medicine.

10. External departments in the field of organic chemistry, biochemistry, Microbiology and Pharmaceutical procedures from Faculty of Pharmacy.
11. External departments in the field of languages - Faculty of Education or Faculty of Arts – English Major.
12. External departments of the Faculty of Commerce in the field of management and marketing.
13. External departments of the Faculty of Law in the field of legislation and administration laws.

The academic council of the program administration approves the faculty members nominated by the concerned departments, and these nominations are presented to the faculty council for approval such that the language of study for all courses is English.

## Article [11]: Study Duration and its Dates

The duration of the study in the program is ten main semesters for all students, and the student may finish studying the program in nine semesters (when the student has successfully passed 160 credit hours). The academic year is divided into two main semesters, each ending with an exam, according to the content stated in the curriculum schedules appended to this regulation.

**The academic year is divided into three semesters:**

1. The first semester: Autumn semester (main semester): It starts at the beginning of the university academic year for a period of 14 teaching weeks.
2. The second semester: Spring semester (main semester): It starts after the mid-year vacation of the university for a period of 14 teaching weeks.
3. Summer semester: It starts in July for a period of 7 teaching weeks doubling the course contact hours.

Enrolment and Registration take place before the start of each semester.

## Article [12]: Study Regulations

All students enrolled in the program must adhere to the following university rules:

### 1. Tuition Fees

Registration fees and educational services are paid at the start of registration, and the faculty council determines the fees required for registration and educational services after they have been approved by the university council.

## 2. Payment Rules

The student is not allowed to register at the next level or know his result unless all tuition fees are paid to the lower level. Upon graduation, the student does not receive his papers and certificates indicating that the degree was awarded unless all the late tuition fees have been paid in full.

## 3. Attendance

The course professor records the attendance of students at the start of each theoretical lecture, or an exercise / practical workshop in a record prepared for that by the Student Affairs of the program, taking into account the following:

A. The absence limit allowed for the students without an acceptable excuse is 25% of the total hours of the tutorials and labs of the course, and the course professor shall notify the Student Affairs Department to warn the student twice, the first warning is after the student exceeds the absence rate of 10% of the course hours, and the second warning is after exceeding the absence rate of 20%. Then, the student's case is presented to the academic council to take measures needed to prevent him from entering the course exam.

B. If the student's absence rate exceeds 25% and the student's absence without an approved excuse is accredited from the academic council of the program, the student will score a deprived grade in the course and the result of a "deprived" grade will be included in the calculation of the student's semester grade and the overall GPA.

## 4. Partial Discontinuation Condition

Students must notify the academic advisor assigned to them by the academic council when they have stopped their studies for more than a week, and if the discontinuation is a result of illness, a "being sick declaration" must be submitted from an accredited governmental hospital or medical center that is approved by the university's medical administration within the specified times. If the student does not take the exam as a result of the illness, a "being sick declaration" must be introduced within the stipulated timings. In addition, a "being sick declaration" approved by the medical administration of the university must be introduced by whom the

student's affairs will be notified of the expected absence period for the student.

5. **Enrollment Stoppage**

In case that the student stops his enrollment in one of the new programs, the student shall pay the related administrative fees.

6. **Address Change**

The student must notify the faculty administration of any change in his postal address.

7. **Demurrage**

If the student is late in paying the fees, the decisions approved by the College Board and the University Council in this regard will be applied.

## Article [13]: Academic Registration and Academic Load

1. **Registration**

The academic council of the program announces the dates of registration in the academic curricula through the approved academic agenda. Students should review their choices with the academic advisors assigned to them according to the instructions written in the program's guide announced on the program's website on the official university website. Registration will not be allowed after the specified date, and if the defaulters are allowed to register, this will be accompanied by a delay fine after being submitted to the academic council.

2. **Advertising**

Information on registration steps is announced in advance of each semester (Academic Agenda).

3. **Academic Load Per Semester**

The minimum and maximum number of credit hours a student is allowed to register in one semester is determined as follows:

**Table (3): The Maximum Registration**

| No | Student's GPA | Maximum Registration |
|---|---|---|
| 1 | **GPA<2** | Up to 14 Credit hours |
| 2 | **2≤GPA<3** | Up to 18 Credit hours |
| 3 | **3≤GPA** | Up to 21 Credit hours |

A. The minimum number of hours a student is allowed to register in **Fall** and **Spring** semesters is 12 credit hours, except for graduation or stumbling cases (under academic observation) based on the approval of the Academic Council.

B. Students may register some courses in the summer semester with a maximum of two courses and up to 3 courses in case of graduating in the

summer semester. In all cases, graduation projects may not be registered during the summer semester.

## Article [14]: The Academic Adviser

The academic council of the program appoints an academic advisor from the teaching staff, at the rate of an academic advisor per 25 students, to guide students in their study trajectory and help them choose the academic courses. Further, he or she determines the number of credit hours they can register according to their circumstances, abilities and academic readiness, and help them solve encountered problems during the study. Besides, he or she supervises the students' study programs, monitoring their progress and monitoring their performance as part of the educational process.

1. The academic advisor meets with his/her students periodically to avoid students being exposed to academic warning.
2. No administrative procedures are taken for any student except through the academic advisor and with his written approval.
3. Each academic advisor determines a time period in his study schedule every week, and a report of this meeting is prepared and submitted to the program management.
4. Students must obtain the approval of the academic advisor assigned to them in choosing a study trajectory before registering for courses in each semester and in the summer semester.

## Article [15]: Addition, Deletion and Retraction

1. After registration, the student may add or delete one of the courses in ways and steps that are approved by the academic council of the program.
2. The student may, after the approval of the academic advisor, unregister one or more courses until the end of the fourth week of study only, without violating the academic load stipulated in Article [13].
3. After the approval of the academic advisor, the student may withdraw from studying any course until the end of the tenth week of the start of registration for the autumn or spring semester (third week of the summer semester). This course is recorded in the student's academic record with a grade of W "withdrawn", provided that the student has not exceeded the percentage of absence prescribed before withdrawal, provided that the withdrawal does not violate the academic load stipulated in Article [13].
4. Re-registration

   The student is allowed to re-register in the study course in which he previously obtained an estimate of **F**, and he is allowed to attend the course

and repeat the exam in accordance with the financial regulations that specify that, where the maximum allowed estimate is **B +**.

5. Elective Courses

   In case that the student registers an elective course and fails and registers the same course again, the student gets the maximum grade of B +, while in the case of changing the elective course, the student gets the newly obtained degree.

## Article [16]: Projects

1. Students prepare 2-3 projects in specific topics related to local industries and service to the surrounding community, to be determined by the Academic Council and during the last two academic years according to what is found in the special tables of the program curricula, and under the supervision of faculty members who to prepare, supervise and discuss projects.
2. The last project, called the Graduation Project, is prepared in the last semester, culminating in what the student has studied during the university years.
3. It is permissible that the Academic Council decide to allocate an additional period for the graduation project that begins after the completion of the last semester exam for a period of one month, and at the end of the period allocated to any of the projects the student submits a scientific report on the subject of the project and discusses it.
4. The student cannot obtain a bachelor's degree unless he successfully performs all the prescribed projects.

## Article [17]: Practical and Field Training

The program includes a training system during the summer vacation for students transferred to levels 200, 300 and 400 and under the supervision of faculty members, as follows:

1. **Practical Training**: students transferred to level 200 will perform a practical training within the faculty or in specialized training centers and units within the faculty for a period of two weeks with a total number of hours of not less than 60 hours. The student should get a practical training completion certificate.
2. **Field Training**: students transferred to level 300 and those to level 400 perform field training within specialized sectors outside the faculty for a period of four weeks with a total number of hours of at least 120 hours. The

student must obtain a certificate from the training authority stating his attendance and obtained the required experience.

3. The faculty is responsible for obtaining training opportunities for students, and students may get training opportunities for themselves, but after faculty council approval is obtained.
4. It is permissible to train students abroad based upon the program academic council approval. The student does not obtain a bachelor's degree unless he has successfully completed both practical and field training.
5. In all training cases, the student is given a Pass/Fail estimate only and his grade is not added to the total grade, but a Pass grade is required to obtain the course degree. The student who reaches level 400 without successfully completing his training can repeat the training any number of times until he passes the training.

The college should provide training opportunities for students in each major through cooperation protocols with companies or through its industrial advisory board.

## Article [18]: Optional Courses

The student is not allowed to register at any of the elective courses unless he is at the planned level and to achieve all the requirements of the pre-requisites, and in all cases the academic advisor must review the registration of the students and remove any wrong registration.

## Article [19]: Courses Registration Synchronization

Fourth level students and students subject to dismissal can register a course in conjunction with the previous prerequisite for the course after obtaining the approval of the program academic council if the following conditions are met:

1. The student has previously studied this prerequisite and received an **F** grade.
2. This registration does not violate the registration rules according to the GPA.

## Article [20]: The Evaluation System

1. Each course is evaluated from (100) one hundred marks.
2. The student is evaluated in theoretical and practical courses based upon the following elements:
   A. In the case of decisions that include only a theoretical study, the evaluation is as follows:

**Table (4) Distribution of degrees for courses that include theoretical study only**

| Evaluation | | Degree |
|---|---|---|
| Semester works | Mid-term exam | 20% |
| | Short exams | 30% |
| | Assignments (report) | |
| | Presentation and discussions | |
| Semester Exam (Written) | | 50% |

B. In the case of study courses that include a theoretical and practical study, the evaluation is as follows:

**Table (5)** Distribution **of degrees for courses that include theoretical and practical study**

| Evaluation | | Degree |
|---|---|---|
| Semester works | Mid-term exam | 20% |
| | Short exams | 20% |
| | Assignments (report) | |
| | Presentation and discussions | |
| Practical Exam | | 10% |
| Semester Exam (Written) | | 50% |

C. In the case of the Project Course, 50% of the degree is allocated to periodic follow-up, 50% for oral discussion.

D. For a student to succeed in any course, he or she must obtain at least 60% of the total score and must have obtained at least 40% of the final written examination score.

## Article [21]: Degrees and Grades Digital and Symbolic Significance

A. The degrees obtained by the student in each course are estimated as shown in the following table:

**Table (6) Table of numerical and symbolic implications of degrees and grades**

| The Student's Obtained % | Equivalent Degrees Range | | | | | Points No | Grade |
|---|---|---|---|---|---|---|---|
| From 97% or more | 97 | 98 | 99 | 100 | -- | 4,00 | A+ |
| 93% to less than 97% | **93** | **94** | **95** | **96** | - | **4.00** | **A** |
| 89% to less than 93% | **89** | **90** | **91** | **92** | - | **3.70** | **A-** |
| 84% to less than 89% | **84** | **85** | **86** | **87** | **88** | **3.30** | **B+** |
| 80% to less than 84% | **80** | **81** | **82** | **83** | - | **3.00** | **B** |
| 76% to less than 80% | **76** | **77** | **78** | **79** | - | **2.70** | **B-** |
| 73% to less than 76% | **73** | **74** | **75** | - | - | **2.30** | **C+** |
| 70% to less than 73% | **70** | **71** | **72** | - | - | **2.0** | **C** |
| 67% to less than 70% | **67** | **68** | **69** | - | - | **1.7** | **C-** |
| 64% to less than 67% | **64** | **65** | **66** | - | - | **1.3** | **D+** |
| 60% to less than 64% | **60** | **61** | **62** | **63** | - | **1.0** | **D** |
| Less than 60% | | | | | | **0.0** | **F** |

B. The course grade is calculated by multiplying the number of credit hours for the course by the number of assessment points (according to Table 6) that the student obtained in this course.

C. The following grades do not fall within the calculation of the average estimate, Table No. (7).

**Table (7): Grades Completion**

| | |
|---|---|
| **W** | Formal Drop out |
| **AU** | listener |
| **I** | Incomplete |
| **F** | Unsuccessful |
| **P** | successful |

a. Semester GPA:

For each course, the total score of the course is equal to the multiplication of both the number of credit hours of the course and the number of course points.

The semester average = the total points for the courses in which the student scored in the semester divided by the number of credit hours for these courses.

$$Semester\ GPA = \frac{Number of Points}{Number of Graded\ Hours} = \frac{\sum_{i=1}^{N} Grade_i \times Hours_i}{\sum_{i=1}^{N} Hours_i}$$

b. Cumulative GPA

The GPA is calculated as follows:

GPA = the sum of the points for the courses divided by the total number of hours for the courses

$$Comulative\ GPA = \frac{Number\ of\ Points}{Number\ of\ Graded\ Hours} = \frac{\sum_{i=1}^{N} Grade_i \times Hours_i}{\sum_{i=1}^{N} Hours_i}$$

c. Total Cumulative Calculation

The total cumulative is calculated as follows for the number of N courses:

For each course the total equivalent of the course scores is calculated equal to the number of credit hours for the course multiplied by the course score.

Cumulative total percentage is equal to the equivalent of the course grades divided by the total number of hours for the courses:

$$Cumulated\ Marks\ \% = \frac{Equivelent\ Accumulated\ Marks}{Number\ of\ Graded\ Hours}$$
$$= \frac{\sum_{i=1}^{N} Mark_i \times Hours_i}{\sum_{i=1}^{N} Hours_i} \times 100$$

d. Requirements Condition are met

For enrollment in courses requiring other courses as pre-requisites, the student's grade in the pre-requisites should not be less than D.

## Article [22]: Graduation Students Grades

The grades obtained by the student upon graduation are granted according to the following schedule:

**Table (8) Estimates Granted upon Graduation from the Program with Credit Hours System**

| The student's obtained percentage | Equivalent Degrees Range | Estimate | Equivalent grade |
|---|---|---|---|
| 97% or more | **4.00** | **A+** | Excellent |
| 93% to less than 97% | **4.00** | **A** | |
| 89% to less than 93% | **3.70** | **A-** | |
| 84% to less than 89% | **3.30** | **B+** | Very good |
| 80% to less than 84% | **3.00** | **B** | |
| 76% to less than 80% | **2.70** | **B-** | |
| 73% to less than 76% | **2.30** | **C+** | Good |
| 70% to less than 73% | **2.0** | **C** | |

## Article [23]: Honors Grade

1. Mansoura University grants a certificate of excellence to students who have obtained an average rating of 3.6 or more in previous semesters, provided that they have not failed any course during the study, and this distinction is recorded in the student's academic record.
2. Upon graduation, the student is awarded the honor degree if he obtains an average grade of 3.3 or more in all major semesters without failing any course.

## Article [24]: Grades Statement

Students who obtain a degree or who drop out from the program have the right to obtain a statement of grades for their academic record, and this statement cannot be obtained during the period of exams, registration, or the date of graduation, and grades data are not given when tuition fees are not paid.

## Article [25]: Academic Warning, Transferring and Dismissals

1. The student is warned academically if he obtains a GPA of less than 2 at the end of the second semester of his enrollment in the study or any other semester after that.
2. The student who is academically warned is placed under academic supervision and is not allowed to register more than 12 credit hours, and the monitoring is stopped if the GPA improves and exceeds the GPA 2.
3. A student who is academically dismissed shall be dismissed from credit hour programs if his cumulative GPA falls below 2.00 for six consecutive main semesters.
4. If the student does not meet the requirements for graduation during the maximum period of study, which is ten years, he will be dismissed.
5. The Faculty Council may consider the possibility of granting a student, subject to dismissal due to his inability to raise his cumulative GPA to at least 2.00 at least, one and last chance of two main semesters to raise his cumulative GPA to 2.00 and fulfil graduation requirements, if he has at least successfully completed 80% of the credit hours required for graduation.
6. A student who registers for 17 or more credit hours is considered a regular student, and the student's position in the study is defined according to Table No. (9).

**Table (9): The Student's Position Based upon the Number of Credit Hours Passed**

| Academic level | Defining the student's Place in the study system | The number of credit hours the student has successfully passed | |
|---|---|---|---|
| | | < | >= |
| 1 | **Freshman** | **32** | **0** |
| 2 | **Sophomore** | **64** | **32** |
| 3 | **Junior** | **112** | **64** |
| 4 | **Senior** | **160** | **112** |

## Article [26]: Graduation and Obtaining the Degree

For the student to obtain a bachelor's degree:

1. The student must have completed at least 160 credit hours in all programs and 163 credit hours in the Building and Construction Engineering Program and 162 credit hours in Materials Engineering for Advanced Technology Program in studying the courses with a grade of no less than **D**.
2. His average grade should not be less than C or more in the cumulative average, and this means that he will obtain at least a cumulative average of 2.00 / 4.00.
3. The student fulfills all program requirements.
4. Immediately after these conditions are fulfilled, the student's condition will be transferred to a graduate and he may not register any other courses under any of the above items.

## Article [27]: Transferring Students -to and from- the Program System

After approval of the academic council for the program and the Mansoura University Council, it is permissible to transfer students to and from the program with the accredited engineering faculties provided that a clearing is made between the courses studied by the student and the courses that he must study and succeed in, and to complete the clearing process the degrees equivalent to the grades specified in the credit hour system are used as shown in Table (1). Table (10) is used to calculate grades when converting from the credit hour system to faculties that do not use the credit hour system.

**Table (10): Equivalence of Estimates when Converting from the Credit Hour System to the Two-Semester System**

| Credit Hour System | | The Semester System | |
|---|---|---|---|
| Number of points | Estimate | Equivalent Estimate | Equivalent Percentage |
| **4.00** | **A +** | **Excellent** | **99%** |
| **4.00** | **A** | | **95%** |
| **3.70** | **A-** | | **91%** |
| **3.30** | **B+** | **Very Good** | **86%** |
| **3.00** | **B** | | **82%** |
| **2.70** | **B-** | **Good** | **78%** |
| **2.30** | **C+** | | **75%** |
| **2.0** | **C** | | **72%** |
| **1.7** | **C-** | **Passed** | **69%** |
| **1.3** | **D+** | | **66%** |
| **1.0** | **D** | | **62%** |
| **0.0** | **F** | **Failed** | **Less than 60%** |

## Article [28]: Appointing Graduates of the Program as a Demonstrators (Teaching Assistants)

1. Teaching assistants from the graduates of the program are appointed via a decision from the University President upon the request of the Faculty Council in accordance with Article (**133**) of Law No. **49** of **1972** regarding the organization of universities and without violating the application of Articles **135** and **136** of the same law.
2. The Faculty Council distributes teaching assistants newly graduated from the programs to the faculty scientific departments corresponding to their majors and based upon the previously presented annual plan of scientific departments

## Article [29]: The Listening System

It is permissible to accept listening students in any of the courses if there are vacant places provided that the listening student cannot perform the exam, or obtain credit hours for joining this course, or can he obtain an attendance statement for the course from the faculty. They may register late after completing the registration for regular students.

## Article [30]: The Improvement System

1. The student is allowed to improve in (5) subjects to raise the GPA during the study period, provided that the student gets the last grade, and it is not permissible to drop out from the course after the end of the official period in which withdrawal is permitted without an academic impact (the fourth week of the main semesters). As the expiration of this period entails the removal of the first estimate.
2. If the student has completed his studies in the program and his GPA is less than 2, he may improve any of the previously studied subjects until he reaches the required minimum of the GPA.
3. The student may not improve a failed course.

## Article [31]: Disciplinary Rules

Students who are enrolled in the program are subject to the disciplinary system outlined in the University Regulatory Law and its executive regulations.

## Article [32]: Electronic Administration

The university designs or contracts with an information administration system for the program to automate the work of the program with a credit hour system. The following conditions are required in this program:

1. Course registration.
2. Adding and removing courses.
3. Academic Advising.
4. program administration work in achieving the rules governing the program.
5. Grades control work.
6. Study work and exams.
7. Financial benefits.
8. Student affairs work.
9. Statement of the situation.
10. Student performance reports.
11. Record the absence of students.
12. E-exams.
13. Communication with students

Taking into account the preservation of confidentiality of data and its recall, ease of use for the student, faculty member and administrative team, and the availability of technical support.

## Article [33]: Incomplete Courses

If a student request not to attend the final exam where he shows compulsive reasons why not to attend, is accepted by the academic council of the program and the faculty council, within two days at most from the final examination date, the course is considered incomplete with an estimate (I) in this course provided that he has obtained at least 60% of the coursework degree or he has been deprived of entering the final exam, in which case he will have the opportunity to take the final exam in the next semester and at the date determined by the faculty council, which is usually in the first week of the next academic semester directly. The degree of the semester work obtained by the student during the semester is added to the final theoretical exam degree which is conducted by the student.

## Article [34]: Appeals for the Results of the Courses

The student can appeal to review the grades of the course within a week of announcing the result, after paying the fees determined in accordance with the overall regulations associated with this matter.

### Article [35]: Implementing the Provisions of the Law Regulating Universities

The provisions of these regulations apply from the academic year following the date of their issuance to new students admitted to the faculty at the level (000) of those programs, and these regulations do not apply retroactively to any student in the faculty.

### Article [36]: General Rules

1. The rules of the Universities Regulatory Law, its executive regulations, the internal regulations of the college, and other university regulations are applied in the absence of a text in these regulations.
2. The student is subject to the general system of the university and the college, and the rules of dismissal from the university, opportunities for re-enrollment, acceptable excuses for not taking the exam, stopping the academic registration, and all the rules, laws and regulations regarding student discipline as stipulated in the Universities Organization Law and its implementing regulations are applied to him/her.
3. The faculty is permitted to add to the list of elective courses with the approval of the Faculty Board and without the need to return to the Engineering Sector Committee.
4. The Faculty Council agrees to change the scientific content of the course in a manner that does not conflict with the course name and objectives.

## Third: Transitional Rules

### Article [37]: Transitional Rules

1. The provisions of these regulations shall be applied to new preparatory year students and those covered by the decisions of the University Council that regulate the enrollment of students in the credit hour programs, starting from the academic year following the issuance of the ministerial decision related to this regulation, and then applied sequentially to the remaining academic years.
2. When the provisions of these regulations are applied to any academic year, work shall apply to the remaining students for repetition, re-enrollment and applicants for the examination from abroad, and the College Board shall adjust the status of these students in the light of this regulation and the previous one.




# A B. Sc. Program in Artificial Intelligence

# Engineering with Credit Hours System

## 1) Program Definition

The Faculty of Engineering, Mansoura University seeks to keep pace with the era of digital transformation, within a framework that keeps pace with the 2030 sustainable development plan. Since the impact of artificial intelligence has extended to almost all areas of life, the Artificial Intelligence Engineering Program offers a sophisticated specialization for those who want to combine the disciplines of advanced electronics, computers, software and systems Advanced control, as the program aims to give the student appropriate basic information in the various engineering disciplines mentioned, and the program also provides the student with the ability to self-learning, to complete the information he/she may need in any specialty in order to deal with a specific applied problem**.**

Artificial intelligence helps to enhance business capabilities in all areas, and gives companies the ability to demonstrate all their potential and raise them to the highest levels; It increases the efficiency and speed of implementation of the business, increases its value, contributes to the continuous development of the business, and increases the number of interacting with these businesses, due to the continuous development of tools and software related to it. the use of artificial intelligence applications has made a great revolution in the automotive industry; For example, autonomous driving programs from Google use artificial intelligence techniques, and logistical transport companies use them to reduce the rate of accidents and reduce traffic congestion. Artificial intelligence applications are used in e-commerce sites, to obtain a clear picture of customer behavior in the purchase processes across the sites. Also, social networks use artificial intelligence applications to detect the presence of a penetration of user images. In addition to the above mentioned, artificial intelligence applications have been used to reduce challenges in the field of health care, such as forecasting ICU conversions, medical examination, improving clinical workflow and predicting hospital-acquired diseases.

Within the framework of the competition to keep pace with future sciences, confront challenges, and develop smart solutions for them, the Faculty of Engineering Mansoura University has integrated this program into its new program system. This achieves the supreme goal of its establishing an integrated engineer within the framework that serve this interdisciplinary.

Last but not least, the program focuses on learning through case studies and multiple projects aimed at solving specific problems in life, not satisfied with one graduation project as is the case in a number of other engineering disciplines, which represents another component of excellence.

## 2) Basic Information

### 2.1 Program Vision

Reaching the rank of innovation and leadership locally and regionally in the field of artificial intelligence engineering (AIE) and its applications.

### 2.2 Program Mission

Preparing a distinguished engineer in the field of artificial intelligence engineering (AIE) and its applications. Also, forming scientifically and professionally qualified engineering cadres capable of competing in major institutions whose field of work depends on advanced technology. In addition to service of society and developing the environment.

### 2.3 Program Objectives

- Providing the student with high capabilities and skills in solving problems at the academic and professional levels.
- Developing the engineer's analytical and logical thinking skills.
- Creating a generation of engineers with a good background in the field of artificial intelligence to work in the design and implementation of complex systems that depend on artificial intelligence.
- Achieving integration between engineering disciplines in the research and applied fields.
- Work to develop engineering research for amending and improving the technological foundations in artificial intelligence engineering applications.
- Serving the community through artificial intelligence applications in various life fields.

### 2.4 Graduate Attributes:

A graduate of the **Artificial Intelligence Engineering (AIE)** program must be able to:

- Apply general and specialized knowledge and theories in the field of AIE.
- Use critical thinking to solve problems that can or cannot be predicted in the context of AIE specialization taking into account all variables.
- Master an expanded set of specialized skills in the field of AIE Engineering.
- Carry out critical evaluation of the results of completed tasks and building technical expertise.
- Identify occupational risks and ways to reduce them.
- Apply cost-effectiveness measures.
- Manage the usual and unusual contexts in the field of AI engineering.
- Use digital and media tools to tackle professional and academic challenges in an innovative way.

- Study and work independently under the general rules and regulations.
- Make correct decisions in the context of medical engineering.
- Take responsibility for himself and the team.
- Carry out optimal exploitation and development of workplace resources.
- Apply work ethics.
- Apply quality assurance standards in all procedures related to AI engineering.

## Competencies of a Graduate According to NARS 2018

(A1) Be able to define, configure and solve complex engineering problems

(A2) Develop, analyze and evaluate results of experiments and simulations and use statistical analysis to extract results

(A3) Apply engineering design processes to produce innovative solutions at low cost to meet the needs of society

(A4) Optimal utilization of contemporary technology, health and safety requirements and principles of crisis management

(A5) Implement research techniques as an integral part of learning

(A6) Plan, supervise and follow up the implementation of engineering projects

(A7) Work efficiently as a member of a multicultural and multicultural team

(A8) Communicate effectively with listeners through contemporary means

(A9) Use innovative, critical thinking and gain leadership skills to confront new situations

(A10) Acquire and apply new knowledge and other learning strategies

**In addition to the competencies of most engineering programs, the AIE program has some special competencies, which are as follows:**

(B1) Prepare and refine data for use in artificial intelligence applications

(B2) Measure the performance of artificial intelligence systems for the purpose of their development

(C1) Design artificial intelligence systems to solve complex problems in various fields

(C2) Build artificial intelligence systems using modern tools

(C3) Application of artificial intelligence systems in various applications

**Table (1): The University Mandatory Courses (UNR)( 13 credit hours)**

| Code | Course Name | Credit | Total SWL | Marks Distribution | | |
|---|---|---|---|---|---|---|
| | | | | **Mid Term** | **semester Works** | Final Term |
| UNR 061 | English (1) | 2 | 5 | 20 | 30 | 50 |
| UNR 021 | History of Engineering and Technology | 1 | 2 | 20 | 30 | 50 |
| UNR 181 | Law and Human Rights | 2 | 4 | 20 | 30 | 50 |
| UNR 121 | Research and Critical Thinking | 2 | 5 | 20 | 30 | 50 |
| UNR 241 | Communication and Presentation Skills | 2 | 5 | 20 | 30 | 50 |
| UNR 261 | Ethics and Morals of The Profession | 2 | 4 | 20 | 30 | 50 |
| UNR 471 | Marketing | 2 | 4 | 20 | 30 | 50 |

## Faculty of Engineering Requirements

College requirements provide students with the knowledge and skills to develop a successful engineer. The Shared College core is applied across all credit hour programs. The unified requirement from the basic courses in the college contains basic knowledge courses for all engineering graduates such as mathematics, physics, mechanics, engineering drawing, design, manufacturing and chemistry. The college requirements for the AIE program for the undergraduate level consist of 45 credit hours (28.125% of the total 160 credit hours), which are completed by completing sixteen (16) mandatory courses. They are illustrated in Table (2).

**Table (2): The Faculty Requirements (45 credit hours)**

| Code | Course Name | Credit | Total SWL | Marks Distribution | | | |
|---|---|---|---|---|---|---|---|
| | | | | **Mid Term** | **Lab** | **semester Works** | Final Term |
| BAS 011 | Mathematics (1) | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 021 | Mechanics (1) | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 012 | Mathematics (2) | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 022 | Mechanics (2) | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 031 | Physics (1) | 3 | 9 | 20 | 10 | 20 | **50** |
| BAS 032 | Physics (2) | 3 | 9 | 20 | 10 | 20 | **50** |
| BAS 041 | Engineering Chemistry | 3 | 9 | 20 | 10 | 20 | **50** |
| PDE 051 | Production Engineering | 3 | 8 | 20 | 10 | 20 | **50** |
| PDE 052 | Engineering Drawing | 3 | 10 | 20 | 0 | 30 | **50** |
| ENG 111 | Technical Reports Writing | 2 | 6 | 20 | 0 | 30 | **50** |
| BAS 115 | Linear Algebra | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 116 | Mathematical Methods for Engineering | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 216 | Statistical data Analysis | 2 | 6 | 20 | 0 | 30 | **50** |
| ELE 151 | Electrical Power and Machines | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 217 | Discrete Mathematics | 3 | 8 | 20 | 0 | 30 | **50** |
| ENG 312 | Project Management | 2 | 5 | 20 | 0 | 30 | **50** |

## Requirements for AI Specialization (Core courses)

The courses distribution according to the specializations in AIE consists of 102 credit hours (63.75% of the total 160 credit hours), which are met by completing 26 compulsory courses equivalent to 78 credit hours, 5 elective courses equivalent to 15 credit hours in addition to 3 graduate projects and field training courses equivalent to 9 credit hours as shown In the following tables:

**Table (3): AIE Requirements (78 credit hours + 15 elective credit hours)**

| Code | Course Name | Credit | Total SWL | Marks Distribution | | | |
|---|---|---|---|---|---|---|---|
| | | | | Mid Term | Lab | semester Works | Final Term |
| CSE 042 | Introduction to Computer Systems | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 151 | Introduction to Artificial Intelligence | 3 | 8 | 20 | 0 | 30 | **50** |
| ECE 121 | Electric Circuits | 3 | 9 | 20 | 10 | 20 | **50** |
| ECE 122 | Electronics | 3 | 9 | 20 | 10 | 20 | **50** |
| CSE 141 | Digital Design | 3 | 9 | 20 | 10 | 20 | **50** |
| CSE 112 | Algorithms and Data Structures | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 111 | Programming (1) | 3 | 8 | 20 | 0 | 30 | **50** |
| BAS 218 | Advanced Engineering Mathematics | 3 | 8 | 20 | 0 | 30 | **50** |
| CSE 221 | Automatic Control | 3 | 6 | 20 | 10 | 20 | **50** |
| ECE 223 | Instrumentation and Measurements | 3 | 9 | 20 | 10 | 20 | **50** |
| ECE 234 | Signals and Systems | 3 | 8 | 20 | 0 | 30 | **50** |
| CSE 251 | Machine Learning | 3 | 8 | 20 | 10 | 20 | **50** |
| CSE 212 | Database Systems | 3 | 8 | 20 | 0 | 30 | **50** |
| ECE 235 | Digital Signal Processing | 3 | 8 | 20 | 0 | 30 | **50** |
| ECE 224 | Sensors, actuators and Sensor Networks | 3 | 8 | 20 | 0 | 30 | **50** |
| ECE 332 | Neural Networks | 3 | 9 | 20 | 10 | 20 | **50** |
| ECE 333 | Digital Image Processing | 3 | 9 | 20 | 10 | 20 | **50** |
| CSE 351 | Deep Learning | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 313 | Data Management | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 317 | Computer Architecture | 3 | 8 | 20 | 0 | 30 | **50** |
| CSE 311 | Programming (2) | 3 | 9 | 20 | 0 | 30 | **50** |
| ECE 321 | Communication Networks | 3 | 8 | 20 | 0 | 30 | **50** |
| CSE 315 | Embedded Systems | 3 | 8 | 20 | 0 | 30 | **50** |
| CSE 423 | Robotics | 3 | 9 | 20 | 10 | 20 | **50** |
| CSE 451 | Big Data | 3 | 8 | 20 | 0 | 30 | **50** |
| CSE 452 | AI Applications | 3 | 8 | 20 | 0 | 30 | **50** |

**Table (3) Continued: List of Elective Courses (Student chooses 5 courses)**

**Elective course Level 300**

| Code | Course Name | Credit | Total SWL | Marks Distribution | | | |
|---|---|---|---|---|---|---|---|
| | | | | **Mid Term** | **Lab** | **semester Works** | Final Term |
| CSE 316 | Decision-Making Systems | 3 | 9 | 20 | 0 | 30 | **50** |
| ECE 334 | Pattern Recognition | 3 | 9 | 20 | 0 | 30 | **50** |
| BAS 315 | Optimization Methods | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 319 | Bioinformatics | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 318 | Human Computer Interaction (HCI) | 3 | 9 | 20 | 0 | 30 | **50** |
| BAS 311 | Statistical Learning | 3 | 9 | 20 | 0 | 30 | **50** |
| ECE 335 | Data Analysis and Visualization | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 352 | Cognitive science | 3 | 9 | 20 | 0 | 30 | **50** |

**Elective courses Level 400**

| Code | Course Name | Credit | Total SWL | Marks Distribution | | | |
|---|---|---|---|---|---|---|---|
| | | | | **Mid Term** | **Lab** | **semester Works** | Final Term |
| ECE 432 | Internet of Things (IOT) | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 454 | Advanced Deep Learning | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 455 | Natural Language Processing | 3 | 9 | 20 | 0 | 30 | **50** |
| ECE 435 | Computer Vision | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 412 | Soft Computing | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 413 | High Performance Computing | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 456 | Biomedical Applications of AI | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 457 | Reinforcement Learning | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 414 | Data Mining | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 458 | AI applications in signal and Audio processing | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 459 | Applications of AI in Art | 3 | 9 | 20 | 0 | 30 | **50** |
| CSE 411 | Cloud Computing | 3 | 9 | 20 | 0 | 30 | **50** |

**Table (4) Projects and Practical Training (9 credit hours)**

| Code | Course Name | Credit | | Total SWL | Marks Distribution | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | **Mid Term** | **Lab** | **semester Works** | Final Term |
| ARI 171 | Practical Training in AI | -- | Mandatory | 3 | -- | -- | -- | -- |
| ARI 271 | Training (1) in AI | -- | Mandatory | 3 | -- | -- | -- | -- |
| ARI 371 | Training (2) in AI | -- | Mandatory | 3 | -- | -- | -- | -- |
| ARI 381 | Project (1) in AI | 3 | Mandatory | 12 | -- | -- | 50 | 50 |
| ARI 481 | Project (2) in AI | 3 | Mandatory | 12 | -- | -- | 50 | 50 |
| ARI 482 | Project (3) in AI | 3 | Mandatory | 14 | -- | -- | 50 | 50 |

## 5) Suggested Curriculum for the Student

The curriculum presents the credit units, weekly contact hours either for lectures, tutorial and practical work for all courses. The curriculum also presents SWL and Marks distribution in addition to the projects and training according to NARS 2018. The student must successfully pass a number of courses totaling 160 credit hours in order to obtain a bachelor's degree in Aritificial Intelligence engineering from the Faculty of Engineering, Mansoura University.

# Level 000

## First Semester

| Course Code | Course Title | Hours/Week | | | | | | Marks Distribution | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| BAS 011 | Mathematics (1) | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | ---- |
| BAS 021 | Mechanics (1) | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | ---- |
| BAS 031 | Physics (1) | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 20 | 10 | 50 | 100 | ---- |
| BAS 041 | Engineering Chemistry | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 20 | 10 | 50 | 100 | ---- |
| PDE 052 | Engineering Drawing | 3 | 2 | 2 | -- | 6 | 10 | 20 | 30 | -- | 50 | 100 | ---- |
| UNR 061 | English (1) | 2 | 1 | 2 | -- | 2 | 5 | 20 | 30 | -- | 50 | 100 | ---- |
| Total | | 17 | 11 | 10 | 3 | 25 | 49 | | | | | 600 | |
| **Total Contact hours = 24 hrs/week  Total SWL = 49 hrs/week** | | | | | | | | | | | | | |

## Second Semester

| Course Code | Course Title | Hours/Week | | | | | | Marks Distribution | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| BAS 012 | Mathematics (2) | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 011 |
| BAS 022 | Mechanics (2) | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 021 |
| BAS 032 | Physics (2) | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 20 | 10 | 50 | 100 | BAS 031 |
| CSE 042 | Introduction to Computer Systems | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | ---- |
| PDE 051 | Production Engineering | 3 | 2 | -- | 3 | 3 | 8 | 20 | 20 | 10 | 50 | 100 | ---- |
| UNR 021 | History of Engineering and Technology | 1 | 1 | -- | -- | 2 | 3 | 20 | 30 | -- | 50 | 100 | ---- |
| Total | | 16 | 11 | 6 | 6 | 22 | 45 | | | | | 600 | |
| **Total Contact hours = 23 hrs/week  Total SWL = 45 hrs/week** | | | | | | | | | | | | | |

# Level 100

## Third Semester

| Course Code | Course Title | Hours/Week | | | | | Marks Distribution | | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| BAS 115 | Linear Algebra | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 012 |
| CSE 151 | Introduction to Artificial Intelligence | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | --- |
| CSE 141 | Digital Design | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 20 | 10 | 50 | 100 | CSE 042 |
| UNR 181 | Law and Human Rights | 2 | 2 | -- | -- | 2 | 4 | 20 | 30 | -- | 50 | 100 | --- |
| ECE 121 | Electrical Circuits | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 032 |
| ENG 111 | Technical Reports Writing | 2 | 1 | 2 | -- | 3 | 6 | 20 | 30 | -- | 50 | 100 | UNR 061 |
| Total | | 16 | 11 | 9 | 1.5 | 21.5 | 43 | | | | | 600 | |
| **Total Contact hours = 21.5 hrs/week  Total SWL = 43 hrs/week** | | | | | | | | | | | | | |

## Fourth Semester

| Course Code | Course Title | Hours/Week | | | | | Marks Distribution | | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| BAS 116 | Mathematical Methods for Engineering | 3 | 2 | 2 | --- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 115 |
| ECE 122 | Electronics | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | ECE 121 |
| CSE 111 | Programming (1) | 3 | 2 | -- | 3 | 4 | 9 | 20 | 20 | 10 | 50 | 100 | CSE 141 |
| CSE 112 | Algorithms and Data Structures | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | CSE 042 |
| ELE 151 | Power & Electrical Machines | 3 | 2 | 2 | --- | 4 | 8 | 20 | 30 | -- | 50 | 100 | ECE 121 |
| UNR 121 | Research and Critical Thinking | 2 | 1 | 2 | - | 3 | 6 | 20 | 30 | -- | 50 | 100 | --- |
| ARI 171 | Practical Training in AI | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | --- |
| Total | | 17 | 11 | 8 | 6 | 27 | 52 | | | | | 600 | |
| **Total Contact hours = 25 hrs/week  Total SWL = 52 hrs/week** | | | | | | | | | | | | | |

## Level 200

### Fifth Semester

| Course Code | Course Title | Hours/Week | | | | | | Marks Distribution | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| BAS 216 | Statistical Data Analysis | 2 | 1 | 2 | -- | 4 | 7 | 20 | 30 | -- | 50 | 100 | BAS 115 |
| ECE 234 | Signals and Systems | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 116 |
| UNR 241 | Communication and Presentation Skills | 2 | 1 | 2 | -- | 2 | 5 | 20 | 30 | -- | 50 | 100 | --- |
| ECE 223 | Instrumentation & Measurements | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | ECE 122 |
| CSE 251 | Machine Learning | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | CSE 151 |
| CSE 221 | Automatic Control | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 116 |
| Total | | 16 | 10 | 11 | 1.5 | 22.5 | 45 | 120 | 180 | -- | 300 | 600 | |
| **Total Contact hours = 22.5 hrs/week  Total SWL = 45 hrs/week** | | | | | | | | | | | | | |

### Sixth Semester

| Course Code | Course Title | Hours/Week | | | | | | Marks Distribution | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| BAS 217 | Discrete Mathematics | 3 | 2 | 2 | --- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 216 |
| ECE 224 | Sensors, actuators & Sensor Networks | 3 | 2 | 2 | --- | 4 | 9 | 20 | 30 | -- | 50 | 100 | ECE 223 |
| BAS 218 | Advanced Engineering Mathematics | 3 | 2 | 2 | --- | 4 | 8 | 20 | 30 | -- | 50 | 100 | BAS 216 |
| UNR 261 | Ethics and Morals of the Profession | 2 | 2 | 0 | 0 | 2 | 4 | 20 | 30 | - | 50 | 100 | --- |
| CSE 212 | Database Systems | 3 | 2 | 0 | 3 | 4 | 9 | 20 | 30 | -- | 50 | 100 | CSE 112 |
| ECE 235 | Digital Signal Processing | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | CSE 234 |
| ARI 271 | Training (1) in AI | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | ARI 171 |
| Total | | 17 | 12 | 7 | 4.5 | 25.5 | 50 | | | | | 600 | |
| **Total Contact hours = 23.5 hrs/week  Total SWL = 50 hrs/week** | | | | | | | | | | | | | |

## Level 300

### Seventh Semester

| Course Code | Course Title | Hours/Week | | | | | Marks Distribution | | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| Elective | Elective Course (1) | 3 | 2 | 2 | -- | 4 | 9 | 20 | 30 | -- | 50 | 100 | According to Course Specs |
| ECE 332 | Neural Networks | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | BAS 218 |
| CSE 311 | Programming (2) | 3 | 2 | -- | 3 | 5 | 9 | 20 | 30 | -- | 50 | 100 | CSE 111, CSE 212 |
| CSE 313 | Data Management | 3 | 2 | -- | 3 | 4 | 9 | 20 | 30 | -- | 50 | 100 | CSE 212 |
| CSE 317 | Computer Architecture | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | CSE 141 |
| ECE 333 | Digital Image Processing | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | ECE 235 |
| Total | | 18 | 12 | 6 | 9 | 26 | 53 | | | | | 600 | |

**Total Contact hours = 27 hrs/week  Total SWL = 53 hrs/week**

### Eighth Semester

| Course Code | Course Title | Hours/Week | | | | | Marks Distribution | | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| CSE 351 | Deep Learning | 3 | 2 | 0 | 3 | 4 | 9 | 20 | 30 | -- | 50 | 100 | ECE 332 |
| CSE 315 | Embedded Systems | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | -- | 50 | 100 | CSE 317 |
| Elective | Elective Course (2) | 3 | 2 | 2 | -- | 5 | 9 | 20 | 30 | -- | 50 | 100 | According to Course Specs |
| ECE 321 | Communication Networks | 3 | 2 | 2 | -- | 4 | 8 | 20 | 30 | -- | 50 | 100 | ECE 234 |
| ENG 312 | Project Management | 2 | 1 | 2 | -- | 2 | 5 | 20 | 30 | -- | 50 | 100 | --- |
| ARI 381 | Project (1) in AI | 3 | 1 | | 6 | 5 | 12 | -- | 50 | -- | 50 | 100 | Reaching level 300 |
| ARI 371 | Training (2) in AI | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | ARI 271 |
| Total | | 17 | 10 | 7 | 10.5 | 24.5 | 55 | | | | | 600 | |

**Total Contact hours = 27.5 hrs/week  Total SWL = 55 hrs/week**

## Level 400

### Ninth Semester

| Course Code | Course Title | Hours/Week | | | | | Marks Distribution | | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| Elective | Elective Course | 3 | 2 | 2 | - | 5 | 9 | 20 | 30 | - | 50 | 100 | According to Course Specs |
| Elective | Elective Course | 3 | 2 | 2 | - | 5 | 9 | 20 | 30 | - | 50 | 100 | According to Course Specs |
| CSE 423 | Robotics | 3 | 2 | 1 | 1.5 | 4.5 | 9 | 20 | 30 | - | 50 | 100 | CSE 221 |
| UNR 471 | Marketing | 2 | 2 | -- | - | 2 | 4 | 20 | 30 | -- | 50 | 100 | -------- |
| ARI 481 | Project (2) in AI | 3 | 1 | -- | 6 | 5 | 12 | - | 50 | -- | 50 | 100 | Reaching Level 400 |
| Total | | 14 | 9 | 5 | 7.5 | 21.5 | 43 | | | | | 600 | |

**Total Contact hours = 21.5 hrs/week  Total SWL = 43 hrs/week**

### Tenth Semester

| Course Code | Course Title | Hours/Week | | | | | Marks Distribution | | | | | | Pre-requisites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit | Lecture | Tutorial | Lab. | Free Work | SWL | Mid-term | Semester Work | Lab. | Final | Total | |
| CSE 451 | Big Data | 3 | 2 | -- | 3 | 4 | 9 | 20 | 30 | -- | 50 | 100 | CSE 313 |
| CSE 452 | AI Applications | 3 | 2 | 0 | 3 | 4 | 9 | 20 | 30 | -- | 50 | 100 | CSE 351 |
| Elective | Elective Course (4) | 3 | 2 | 2 | -- | 5 | 9 | 20 | 30 | -- | 50 | 100 | According to Course Specs |
| ARI 482 | Project (3) in AI | 3 | 1 | | 6 | 7 | 14 | | 50 | -- | 50 | 100 | ARI 481 |
| Total | | 12 | 7 | 2 | 12 | 20 | 41 | | | | | 400 | |

**Total Contact hours = 21 hrs/week  Total SWL = 41hrs/week**

## Program Vision

Reaching the rank of innovation and leadership locally and regionally in the field of artificial intelligence engineering (AIE) and its applications.

## Program Mission

Preparing a distinguished engineer in the field of artificial intelligence engineering (AIE) and its applications. Also, forming scientifically and professionally qualified engineering cadres capable of competing in major institutions whose field of work depends on advanced technology. In addition to service of society and developing the environment.

MANSOURA UNIVERSITY
جامعة المنصورة

برنامج هندسة الذكاء الاصطناعي
Artificial Intelligent Engineering Program