Ministry of Higher Education and
Scientific Research
Scientific Supervision and Evaluation
Authority
Quality Assurance and Academic
Accreditation Department

# Academic Program Description Form for Colleges and Institutes

University Name: University of Mosul

College Name : College of Computer Science and Mathematics

Scientific Department Name: Department of Statistics and Informatics

Date of Filling the File: 2 / 4 / 2023

جامعة الموصل
كلية علوم الحاسوب
والرياضيات
قسم الاحصاء
والمعلوماتية

Signature

Head of the Scientific Department

Date

Signature

Assistant Dean for Scientific Affairs

Date

File Reviewed by
Quality Assurance and University Performance Division

Signature:

Head of Quality Assurance and University Performance Division

Date:

Approved by Mr./Dean of the College

Date

# Academic Program Description Form

**Review of the performance of higher education institutions ((((academic program review**

## Academic program description

This academic program description provides a brief summary of the most important characteristics of the program and the learning outcomes expected from the student to achieve them in the Department of Statistics and Informatics at various stages of study, to show whether the student has achieved maximum benefit from the study and the opportunities available to him, and what accompanies it of a description of the curriculum prescribed within the academic program set by the department.

| | | |
|---|---|---|
| .1 | **Educational Institution** | **University of Mosul** |
| .2 | **University Department/Center** | **College of Computer Science Mathematics / Department of Statistics and Informatics** |
| .3 | **Academic Program Name** | **Statistics and Informatics** |
| .4 | **Final Degree Name** | **Bachelor of Science in Statistics** |
| .5 | **Study System** | **Semester System** |
| .6 | **Accredited Accreditation Program** | **Accreditation Board for Engineering and Technology (ABET)** |
| .7 | **Other External Influences** | **Central Examinations** |
| .8 | **Date of Preparation of Description** | **2023 / 9 /25** |

| | |
|---|---|
| .9 | **Academic program objectives**<br>**1.** Continuous aspiration towards cognitive excellence in education, scientific research and professional service in various sciences.<br>2. Preparing students for the labor market and developing their ability to interact and communicate with others through effective participation in the field training program.<br>3. Acquiring skills to present ideas and work within a single team through graduation projects.<br>4. Qualifying students for postgraduate studies in the field of statistics, informatics and operations research.<br>5. Preparing specialized scientific leaders through the postgraduate program.<br>6. Interacting with other sciences, especially mathematics and computers. |
| .10 | **Required learning outcomes, teaching, learning and assessment methods** |
| أ- | **knowledge and understanding**<br>1. The student learns modern statistical methods and the importance of statistics in various scientific, medical and economic fields, including the humanitarian.<br>2. Teaching the student the importance of statistics integrated with mathematics and computer science.<br>3. Learning the ability to find possible scientific solutions to solve any problem.<br>4. The student learns the ability to program based on various modern applied statistical programs and various programming languages by writing special programs to solve the problem.<br>5. The student learns to expand his imagination and establish probabilistic laws in solving and estimating problems.<br>6. The ability to develop sound ideas to build mathematical models for them and estimate their features according to various statistical methods.<br>7. The ability to develop appropriate hypotheses to solve any problem with testing them according to the appropriate statistical means for the purpose of making the correct decision.<br>8. Developing the student's skills in linking statistics and intelligence systems that depend on the basis of analysis, inference and decision- |

| | |
|---|---|
| | making.<br>9. Providing the student with some basic rules in evaluation and building statistical information systems and programming and analyzing them on modern foundations.<br>10. Providing the student with sufficient information in analysis, design and research. |
| ب- | **Subject-specific skills**<br>1. Theory<br>2. Practical<br>3. Student Training/Summer Training<br>4. Graduation Research |
| | **Teaching and learning methods**<br>1. Using a regular board.<br>2. Using a smart board.<br>3. Using data display.<br>4. Using computers.<br>5. Using field surveys to collect data.<br>6. Using different educational platforms. |
| | **Theoretical and practical lectures, applications, daily .assignments, and discussions** |
| | **Evaluation methods**<br>1. Online exams.<br>2. Central and monthly exams.<br>3. Daily exams.<br>4. Daily assignments.<br>5. Scientific reports.<br>6. Computer laboratory exams.<br>7. Graduation projects. |

| | |
|---|---|
| ج- | **Thinking skills**<br>1. Deduction and analysis skill.<br>2. Mathematical and statistical solution skill.<br>3. Comparison skill, hypothesis building and decision making.<br>4. Skill of building, analyzing and interpreting mathematical models.<br>5. Discussion skill and making sound decisions.<br>6. Skill of using modern means including computers.<br>7. Skill of using modern applied statistical programs and programming language.<br>8. Skill of writing programs to solve and estimate problems.<br>9. Skill of searching for correct scientific information.<br>10. Skill of conducting scientific research, analyzing and solving problems related to them and making appropriate conclusions in solving them for the purpose of decision making. |
| | **Teaching and learning methods**<br>1. Theoretical lectures.<br>2. Practical lectures.<br>3. Research, analysis and interpretation.<br>4. Scientific discussions. |
| | **Lectures, scientific experiments, applications, homework, and scientific discussions.** |
| | **Evaluation methods**<br>1. Online exams.<br>2. Written and oral exams.<br>3. Graduation projects/research.<br>4. Discussions.<br>5. Assessment and discussion of assignments and projects.<br>6. Evaluation of individual and group scientific research.<br>7. Evaluation of practical performance and methodology of analysis and interpretation.<br>8. Evaluation of good statistical analyses in various scientific journals. |
| د- | **General and transferable skills (other skills related to employability and personal development(** |
| | **Teaching and learning methods**<br>1. Ability to study in groups.<br>2. Ability to discuss scientific issues among students.<br>3. Ability to develop skills among students.<br>4. Ability to discuss, analyze and make group decisions.<br>5. Develop the ability to cooperate. |

## 11- Program Description

| Year/Level | Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| | | | theoretical | practical |
| First year/ Chapter I | CMSI22-F1121 | Elementary Statistics I | 3 | - |
| | CMSI22-F1131 | Calculus I | 3 | - |
| | | Basics Programming | 2 | 1 |
| | CMSI22-F1211 | Linear Algebra | 2 | - |
| | CMSI22-F1141 | Democracy & Human Rights | 2 | - |
| | | Arabic Language | 2 | - |
| First year/ Chapter II | CMSI23-F1221 | Elementary Statistics II | 3 | 1 |
| | CMSI23-F1231 | Calculus II | 3 | 1 |
| | CMSI23-F1241 | Demography | 2 | - |
| | CMSI23-F1211 | MATLAB programming | 2 | - |
| | CMSI23-F1251 | Computer | 2 | - |
| | CMSI23-F2171 | English Language | 2 | - |
| Second Year/ Chapter I | CMSI24-F2111 | Probability and random variables(1) | 3 | 1 |
| | CMSI24-F2121 | Sampling Theory(1) | 2 | 1 |
| | CMSI24-F2161 | Data structures(1) | 2 | 2 |
| | CMSI24-F2151 | Linear Algebra | 3 | 1 |
| | CMSI24-F2141 | Time Series Analysis | 2 | 2 |
| | CMSI24-F2131 | Numerical Analysis(1) | 2 | 2 |
| | CMSI24-F2171 | Teaching methods | 2 | 0 |
| Second Year/ Chapter II | CMSI24-F2211 | Probability and random variables(2) | 3 | 1 |
| | CMSI24-F2221 | Sampling Theory(2) | 1 | 2 |
| | CMSI24-F2241 | Databases | 2 | 2 |
| | CMSI24-F2251 | Differential Equations | 3 | - |
| | CMSI24-F2231 | Numerical Analysis(2) | 2 | 2 |
| | CMSI24-F2271 | Principles of Economics | 2 | - |
| | CMSI24-F2261 | Research Methodology | 2 | - |
| | CMSI24-F2281 | English Language | 2 | - |
| Third Year/ Chapter I | CMSI24-F3111 | Mathematical Statistics(1) | 3 | - |
| | CMSI24-F3151 | Operation Research(1) | 3 | - |
| | CMSI24-F3121 | Regression Analysis(1) | 3 | - |
| | CMSI24-F3161 | Information Systems Management | 3 | - |
| | CMSI24-F3171 | queuing theory | 2 | - |
| | CMSI24-F3131 | Biostatistics(1) | 2 | - |
| | CMSI24-F3141 | Reliability | 3 | - |
| Third Year/ Chapter II | CMSI24-F3211 | Mathematical Statistics(2) | 3 | - |
| | CMSI24-F3251 | Operation Research(2) | 3 | - |
| | CMSI24-F3261 | Information security | 2 | 2 |
| | CMSI24-F3241 | Data Mining(1) | 2 | 2 |
| | CMSI24-F3231 | Biostatistics(2) | 2 | - |

| | | | | |
|---|---|---|---|---|
| | CMSI24-F3221 | Regression Analysis(2) | 3 | - |
| | | English Language | 2 | - |
| **the fourth year/ Chapter I** | CMSI24-F4121 | Stochastic Processes(1) | 3 | - |
| | CMSI24-F4141 | Design and Analysis of Experiments (1) | 3 | - |
| | CMSI24-F4151 | Data Mining(2) | 2 | 2 |
| | CMSI24-F4161 | Simulation | 2 | - |
| | CMSI24-F4111 | Statistical Inference(1) | 3 | - |
| | CMSI24-F4131 | Multivariate Analysis(1) | 3 | - |
| **the fourth year/ Chapter II** | CMSI24-F4221 | Stochastic Processes(2) | 3 | - |
| | CMSI24-F4251 | Intelligence Techniques | 2 | 2 |
| | CMSI24-F4231 | Multivariate Analysis(2) | 3 | - |
| | CMSI24-F4241 | Design and Analysis of Experiments (2) | 3 | - |
| | CMSI24-F4211 | Statistical Inference(2) | 3 | - |
| | | English Language | 2 | - |
| | | Project | 4 | - |

| **Bachelor's degree in Statistics requires (143) credit hours** | **Certificates and Credit Hours** |
|---|---|

## 11 .Planning for personal development

1. E-learning.
2. Using the Internet.
3. Using modern means of communication.
4. Using modern means of communication.
5. Extracurricular activities.
6. Advanced training courses in learning modern programs.
7. Scientific statistical consultations and ways to develop and apply them in various fields.

## 12. dmission criteria (setting regulations related to admission to the college or institute(

Central admission in the Ministry of Higher Education and Scientific Research. The student's average is within the central admission lists, with the exception of the children of teachers, the sons of martyrs, and the privileges stipulated in the Ministry's instructions, as they are accepted according to desire to be distributed to the scientific departments.

## Student Guide for Central Admission Prepared by the Ministry of Higher Education and Scientific Research

# Program Skills Outline

| Year/Level | Course Code | Course Name | Basic or optional | Required program Learning outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Knowledge | | | | Skills | | | | Ethics | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| First year/ Chapter I | STAT101 | Elementary Statistics I | C | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | STAT102 | Calculus I | B | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | |
| | STAT103 | Basics Programming | B | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | STAT104 | Linear Algebra | B | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | UOM104 | Democracy & Human Rights | B | | √ | | | √ | | | | | √ | √ | √ |
| | UOM101 | Arabic Language | B | | √ | √ | | √ | √ | √ | √ | | √ | √ | √ |
| First year/ Chapter II | STAT107 | Elementary Statistics II | C | √ | | | | √ | | √ | | | √ | | |
| | STAT108 | Calculus II | B | | √ | | | | √ | √ | | | √ | | |
| | STAT109 | Demography | C | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| | STAT110 | MATLAB programming | B | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| | UOM103 | Computer | B | √ | | | | | √ | √ | √ | √ | √ | √ | √ |
| | UOM102 | English Language | B | √ | √ | √ | | √ | √ | √ | √ | | √ | √ | √ |

| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| Second Year/ Chapter I | CMSI24-F2111 | Probability and random variables(1) | Basic | √ | | | | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F2121 | Sampling Theory(1) | Basic | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F2161 | Data structures(1) | Basic | | √ | √ | √ | | √ | √ | √ | | √ | √ | √ |
| | CMSI24-F2151 | Linear Algebra | Basic | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ |
| | CMSI24-F2141 | Time Series Analysis | my choice | √ | √ | √ | √ | | √ | | | √ | | √ | √ |
| | CMSI24-F2131 | Numerical Analysis(1) | my choice | | | | | | √ | | | | √ | | |
| | CMSI24-F2171 | Teaching methods | my choice | | √ | √ | | √ | | √ | √ | | √ | | |
| Second Year/ Chapter II | CMSI24-F2211 | Probability and random variables(2) | Basic | √ | √ | √ | | √ | | √ | √ | √ | √ | √ | √ |
| | CMSI24-F2221 | Sampling Theory(2) | Basic | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F2241 | Databases | Basic | | √ | | | | √ | | | √ | | | |
| | CMSI24-F2251 | Differential Equations | my choice | √ | | | | √ | | | | | √ | | |
| | CMSI24-F2231 | Numerical Analysis(2) | my choice | √ | | √ | √ | √ | √ | √ | | √ | | √ | √ |
| | CMSI24-F2271 | Principles of Economics | my choice | √ | | √ | √ | √ | √ | √ | | √ | | √ | √ |
| | CMSI24-F2261 | Research Methodology | | √ | | √ | √ | √ | √ | | | | | √ | √ |
| | CMSI24-F2281 | English Language | | √ | | √ | √ | √ | √ | | √ | √ | | √ | √ |

| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| Third Year/ Chapter I | CMSI24-F3111 | Mathematical Statistics(1) | Basic | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F3151 | Operation Research(1) | Basic | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F3121 | Regression Analysis(1) | Basic | √ | √ | √ | √ | √ | | | | √ | √ | √ | √ |
| | CMSI24-F3161 | Information Systems Management | Basic | | √ | | | | √ | √ | √ | | √ | | |
| | CMSI24-F3171 | queuing theory | my choice | √ | √ | √ | √ | | √ | √ | √ | | √ | | |
| | CMSI24-F3131 | Biostatistics(1) | my choice | √ | √ | √ | √ | √ | | | | √ | | | |
| | CMSI24-F3141 | Reliability | my choice | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | |
| Third Year/ Chapter II | CMSI24-F3211 | Mathematical Statistics(2) | Basic | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | |
| | CMSI24-F3251 | Operation Research(2) | Basic | √ | | | | √ | √ | √ | | √ | | | |
| | CMSI24-F3261 | Information security | Basic | | √ | | | | √ | | | | √ | | |
| | CMSI24-F3241 | Data Mining(1) | Basic | √ | | | | √ | | | | √ | | | |
| | CMSI24-F3231 | Biostatistics(2) | my choice | √ | | | | √ | | | | | √ | | |
| | CMSI24-F3221 | Regression Analysis(2) | my choice | | √ | √ | √ | √ | √ | √ | √ | √ | √ | | |
| | | English Language | my choice | | √ | | | | √ | √ | √ | √ | √ | | |

| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| **Program Skills Outline** | | | | | | | | | | | | | | | |
| | | | | **Required program Learning outcomes** | | | | | | | | | | | |
| **Year/Level** | **Course Code** | **Course Name** | **Basic or optional** | **Knowledge** | | | | **Skills** | | | | **Ethics** | | | |
| | | | | **A1** | **A2** | **A 3** | **A4** | **B1** | **B2** | **B3** | **B4** | **C1** | **C2** | **C3** | **C4** |
| **First year/ Chapter I** | STAT101 | Elementary Statistics I | **C** | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | STAT102 | Calculus I | **B** | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | |
| | STAT103 | Basics Programming | **B** | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | STAT104 | Linear Algebra | **B** | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | UOM104 | Democracy & Human Rights | **B** | | √ | | | √ | | | | | √ | √ | √ |
| | UOM101 | Arabic Language | **B** | | √ | √ | | √ | √ | √ | √ | | √ | √ | √ |
| **First year/ Chapter II** | STAT107 | Elementary Statistics II | **C** | √ | | | | √ | | √ | | | √ | | |
| | STAT108 | Calculus II | **B** | | √ | | | | √ | √ | | | √ | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAT109 | Demography | **C** | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| | STAT110 | MATLAB programming | **B** | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| | UOM103 | Computer | **B** | √ | | | | | √ | √ | √ | √ | √ | √ | √ |
| | UOM102 | English Language | **B** | √ | √ | √ | | √ | √ | √ | √ | | √ | √ | √ |
| **Year/Level** | **Course Code** | **Course Name** | **Basic or optional** | **Knowledge** | | | | **Skills** | | | | **Ethics** | | | |
| | | | | **A1** | **A2** | **A 3** | **A4** | **B1** | **B2** | **B3** | **B4** | **C1** | **C2** | **C3** | **C4** |
| **Second Year/ Chapter I** | CMSI24-F2111 | Probability and random variables(1) | **Basic** | √ | | | | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F2121 | Sampling Theory(1) | **Basic** | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F2161 | Data structures(1) | **Basic** | | √ | √ | √ | | √ | √ | √ | | √ | √ | √ |
| | CMSI24-F2151 | Linear Algebra | **Basic** | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ |
| | CMSI24-F2141 | Time Series Analysis | **my choice** | √ | √ | √ | √ | | √ | | | √ | | √ | √ |
| | CMSI24-F2131 | Numerical Analysis(1) | **my choice** | | | | | | √ | | | | √ | | |
| | CMSI24-F2171 | Teaching methods | **my choice** | | √ | √ | | √ | | √ | √ | | √ | | |
| **Second Year/** | CMSI24-F2211 | Probability and | **Basic** | √ | √ | √ | | √ | | √ | √ | √ | √ | √ | √ |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chapter II** | | random variables(2) | | | | | | | | | | | | | |
| | CMSI24-F2221 | Sampling Theory(2) | **Basic** | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F2241 | Databases | **Basic** | | √ | | | | √ | | | √ | | | |
| | CMSI24-F2251 | Differential Equations | **my choice** | √ | | | | √ | | | | | √ | | |
| | CMSI24-F2231 | Numerical Analysis(2) | **my choice** | √ | | √ | √ | √ | √ | √ | | √ | | √ | √ |
| | CMSI24-F2271 | Principles of Economics | **my choice** | √ | | √ | √ | √ | √ | √ | | √ | | √ | √ |
| | CMSI24-F2261 | Research Methodology | | √ | | √ | √ | √ | √ | | | | | √ | √ |
| | CMSI24-F2281 | English Language | | √ | | √ | √ | √ | √ | | √ | √ | | √ | √ |

| **Year/Level** | **Course Code** | **Course Name** | **Basic or optional** | **Knowledge** | | | | **Skills** | | | | **Ethics** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **A1** | **A2** | **A 3** | **A4** | **B1** | **B2** | **B3** | **B4** | **C1** | **C2** | **C3** | **C4** |
| **Third Year/ Chapter I** | CMSI24-F3111 | Mathematical Statistics(1) | **Basic** | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F3151 | Operation Research(1) | **Basic** | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F3121 | Regression Analysis(1) | **Basic** | √ | √ | √ | √ | √ | | | | √ | √ | √ | √ |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CMSI24-F3161 | Information Systems Management | **Basic** | | √ | | | | √ | √ | √ | | √ | | |
| | CMSI24-F3171 | queuing theory | **my choice** | √ | √ | √ | √ | | √ | √ | √ | | √ | | |
| | CMSI24-F3131 | Biostatistics(1) | **my choice** | √ | √ | √ | √ | √ | | | | √ | | | |
| | CMSI24-F3141 | Reliability | **my choice** | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | |
| **Third Year/ Chapter II** | CMSI24-F3211 | Mathematical Statistics(2) | **Basic** | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | |
| | CMSI24-F3251 | Operation Research(2) | **Basic** | √ | | | | √ | √ | √ | | √ | | | |
| | CMSI24-F3261 | Information security | **Basic** | | √ | | | | √ | | | | √ | | |
| | CMSI24-F3241 | Data Mining(1) | **Basic** | √ | | | | √ | | | | √ | | | |
| | CMSI24-F3231 | Biostatistics(2) | **my choice** | √ | | | | √ | | | | | √ | | |
| | CMSI24-F3221 | Regression Analysis(2) | **my choice** | | √ | √ | √ | √ | √ | √ | √ | √ | √ | | |
| | | English Language | **my choice** | | √ | | | | √ | √ | √ | √ | √ | | |
| **Year/Level** | **Course Code** | **Course Name** | **Basic or** | **Knowledge** | | | | **Skills** | | | | **Ethics** | | | |

| | | | optional | A1 | A2 | A 3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| the fourth year/ Chapter I | CMSI24-F4121 | Stochastic Processes(1) | Basic | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F4141 | Design and Analysis of Experiments (1) | Basic | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F4151 | Data Mining(2) | Basic | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F4161 | Simulation | Basic | √ | √ | √ | √ | | √ | | | | √ | √ | √ |
| | CMSI24-F4111 | Statistical Inference(1) | Basic | √ | | | | √ | | | | √ | | | |
| | CMSI24-F4131 | Multivariate Analysis(1) | Basic | √ | | | | √ | √ | √ | √ | √ | √ | √ | √ |
| the fourth year/ Chapter II | CMSI24-F4221 | Stochastic Processes(2) | Basic | √ | | | | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F4251 | Intelligence Techniques | Basic | | √ | | | | √ | | | √ | √ | √ | √ |
| | CMSI24-F4231 | Multivariate Analysis(2) | Basic | √ | | √ | √ | √ | | | | √ | √ | √ | √ |
| | CMSI24-F4241 | Design and Analysis of Experiments (2) | Basic | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F4211 | Statistical Inference(2) | Basic | √ | | √ | √ | √ | √ | √ | √ | √ | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | English Language | **Basic** | √ | | √ | √ | | √ | | | | √ | | |
| | | Project | **Basic** | √ | | √ | √ | | √ | | | | √ | | |
| **the fourth year/ Chapter I** | CMSI24-F4121 | Stochastic Processes(1) | **Basic** | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F4141 | Design and Analysis of Experiments (1) | **Basic** | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F4151 | Data Mining(2) | **Basic** | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ |
| | CMSI24-F4161 | Simulation | **Basic** | √ | √ | √ | √ | | √ | | | | √ | √ | √ |
| | CMSI24-F4111 | Statistical Inference(1) | **Basic** | √ | | | | √ | | | | √ | | | |
| | CMSI24-F4131 | Multivariate Analysis(1) | **Basic** | √ | | | | √ | √ | √ | √ | √ | √ | √ | √ |
| **the fourth year/ Chapter II** | CMSI24-F4221 | Stochastic Processes(2) | **Basic** | √ | | | | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F4251 | Intelligence Techniques | **Basic** | | √ | | | | √ | | | √ | √ | √ | √ |
| | CMSI24-F4231 | Multivariate Analysis(2) | **Basic** | √ | | √ | √ | √ | | | | √ | √ | √ | √ |
| | CMSI24-F4241 | Design and Analysis of Experiments (2) | **Basic** | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | CMSI24-F4211 | Statistical Inference(2) | **Basic** | √ | | √ | √ | √ | √ | √ | √ | √ | | | |
| | | English Language | **Basic** | √ | | √ | √ | | √ | | | | √ | | |
| | | Project | **Basic** | √ | | √ | √ | | √ | | | | √ | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastic Processes (2)**

## For the academic year 2022-2023
## Course Description Form

| |
|---|
| 1. Course Name: |
| Stochastic Processes II |
| 2. Course Code: |
| CMSI24-F4221 |
| 3. Semester / Year: |
| 2022-2023 |
| 4. Description Preparation Date: |
| 1/2/2023 |
| 5. Available Attendance Forms: |
| Studying in classrooms in the department |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| Theory 3 + Tutorial 1 in week / 3 units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Asst. Prof. Dr. Muthanna Subhi Sulaiman<br>Email: muthanna.sulaiman@uomosul.edu.iq<br>Name: Lecture Shaimaa Waleed Mohmood<br>Email: shaimaa.waleed@uomosul.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | 1.Understand the concept of a Markov chain and its classifications.<br>2.Recognize the different types of states in a Markov chain, such as absorbing, transient, and recurrent states.<br>3.Learn to classify Markov chains based on their behavior, including irreducible, reducible, and periodic chains. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastic Processes (2)**

**For the academic year 2022-2023**

| | |
|---|---|
| | 4.Identify and analyze the stationary distribution of a Markov chain.<br>5.Understand the basic properties and characteristics of a Poisson process.<br>6.Derive and interpret the probability density function and cumulative distribution function of the Poisson process.<br>7.Understand the concept and assumptions of a branching process.<br>8.Calculate the mean and variance of a branching process.<br>9.Understand the characteristics and assumptions of a birth and death process.<br>10. Calculate the mean and variance of a birth and death process.<br>11. Understand the basic concepts and components of queuing models.<br>12. Identify and apply different queuing models, such as M/M/1. |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, computer labs, assignments, quizzes, and projects. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 4 | Communicate effectively, both orally and in writing, about the concepts, analysis, and results related to the classification of these stochastic processes. | Classification of Markov Chain. Classification of state of a Markov chain. | Lecture, discussion. | Exams, assignments, and reports. |
| 2 | 4 | Classify and analyze different types of states or behaviors within each process, such as absorbing, transient, recurrent, and periodic states. | Recurrent and transient states. | Lecture, discussion. | Exams, assignments, and reports. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastic Processes (2)**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| 3 | 4 | Classify and analyze different types of states or behaviors within each process, such as absorbing, transient, recurrent, and periodic states. | Computation of first passage and mean recurrence time. | Lecture, discussion. | Exams, assignments, and reports. |
| 4 | 4 | Evaluate and interpret the stationary distribution, steady-state behavior, and equilibrium properties of the processes. | Stationary distribution of a Markov chain (steady states dist.). | Lecture, discussion. | Exams, assignments, and reports. |
| 5 | 4 | Gain a solid understanding of the fundamental concepts and principles of stochastic processes | Markov Process with discrete state space, introduction to counting process. | Lecture, discussion. | Exams, assignments, and reports. |
| 6 | 4 | Gain a solid understanding of the fundamental concepts and principles of stochastic processes | The Poisson process, and assumptions Poisson process. | Lecture, discussion. | Exams, assignments, and reports. |
| 7 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Derivation the p.d.f. of a Poisson process. | Lecture, discussion. | Exams, assignments, and reports. |
| 8 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Properties of Poisson process, additive and difference property. | Lecture, discussion. | Exams, assignments, and reports. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastic Processes (2)**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| 9 | 4 | Develop forecasting skills and forecast future results using stochastic models. | Mid-term Exam + Decomposition of a Poisson process. | Lecture, discussion. | Exams, assignments, and reports. |
| 10 | 4 | Develop forecasting skills and forecast future results using stochastic models. | Poisson process and related distribution- Inter arrival time and waiting time. | Lecture, discussion. | Exams, assignments, and reports. |
| 11 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Introduction to Branching Process. Generating function and probability of extinction. | Lecture, discussion. | Exams, assignments, and reports. |
| 12 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Calculate the mean and variance of a branching process. | Lecture, discussion. | Exams, assignments, and reports. |
| 13 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Birth and Death process. Pure Birth process and Yule – Furry process. | Lecture, discussion. | Exams, assignments, and reports. |
| 14 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Pure death process and pure Birth – Death process. | Lecture, discussion. | Exams, assignments, and reports. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastic Processes (2)**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| 15 | 4 | Calculate and interpret relevant performance measures, such as mean, variance, extinction probabilities, and waiting times. | Stochastic Process in Queuing model, General concepts, m/m/1 steady state behavior. | Lecture, discussion. | Exams, assignments, and reports. |

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc , 40+60

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Al-Rubaie, Fadel Mohsen and Abd, Salah Hamza, (2000), "Introduction to Stochastic Processes." Dar-Books and Documents, Baghdad. |
| Main references (sources) | • Cox D.R &H.D. Miller, "The theory of stochastic process", 1985.<br>• Parzen," Stochastic Process", 1962.<br>• Ross, S. M. (1983), "Stochastic Processes" Wiley, New York. |
| Recommended books and references (scientific journals, reports…) | Thanoun, Basil Younis, (2011), "Markovian Modeling with Practical Applications." Dar Ibn Al-Atheer for Printing and Publishing, University of Mosul, Iraq. Part one and two. |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastics Processes (1)**

## For the academic year 2022-2023
## Course Description Form

| |
|---|
| 1. Course Name: |
| Stochastic Processes I |
| 2. Course Code: |
| CMSI23-F4121 |
| 3. Semester / Year: |
| 2022-2023 |
| 4. Description Preparation Date: |
| 1/9/2022 |
| 5. Available Attendance Forms: |
| Studying in classrooms in the department |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| Theory 3 + Tutorial 1 in week / 3 units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Asst. Prof. Dr. Muthanna Subhi Sulaiman<br>Email: muthanna.sulaiman@uomosul.edu.iq<br>Name: Lecture Shaimaa Waleed Mohmood<br>Email: shaimaa.waleed@uomosul.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| Course Objectives | 1. This course provides a comprehensive introduction to stochastic processes.<br>2. Focusing on their fundamental concepts, principles, and applications.<br>3. It covers topics ranging from basic probability theory to advanced stochastic models. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastics Processes (1)**

## For the academic year 2022-2023

| | |
|---|---|
| | 4. Equipping students with the necessary knowledge and skills to analyze and model various phenomena involving randomness and uncertainty.<br>5. Modeling and analyzing systems with the Markov property.<br>6. Understanding the behavior of Markov chains.<br>7. Examining transition probabilities and constructing transition matrices.<br>8. Studying special types of Markov chains, such as absorbing and ergodic chains.<br>9. Determining and analyzing the stationary distribution. |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, computer labs, assignments, quizzes, and projects. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 4 | Understanding of generating function and probability generating | Definition of generating function and probability generating function. | Lecture, discussion. | Exams, assignments, and reports. |
| 2 | 4 | Understanding of generating function and probability generating | Probability generating function of sum discrete random variables. | Lecture, discussion. | Exams, assignments, and reports. |
| 3 | 4 | Understanding of generating function and probability generating | Probability generating function of sum of a random number of discrete random variables. | Lecture, discussion. | Exams, assignments, and reports. |
| 4 | 4 | Understanding of generating function and probability generating | Generating function of bivariate distribution. | Lecture, discussion. | Exams, assignments, and reports. |
| 5 | 4 | Gain a solid understanding of the fundamental concepts | Introduction to Stochastic processes. | Lecture, discussion. | Exams, assignments, and reports. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastics Processes (1)**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | and principles of stochastic processes | | | |
| 6 | 4 | Gain a solid understanding of the fundamental concepts and principles of stochastic processes | Definitions and examples of stochastic processes. | Lecture, discussion. | Exams, assignments, and reports. |
| 7 | 4 | Identify and analyze sources of uncertainty and randomness in various systems | Specification of stochastic processes with independent increments. | Lecture, discussion. | Exams, assignments, and reports. |
| 8 | 4 | Identify and analyze sources of uncertainty and randomness in various systems | Mid-term Exam + Stationary processes, Covariance stationary, Gaussian process. | Lecture, discussion. | Exams, assignments, and reports. |
| 9 | 4 | Develop skills in predicting and forecasting future outcomes using stochastic models | Definition of Markov Chain and transition probability matrix. | Lecture, discussion. | Exams, assignments, and reports. |
| 10 | 4 | Develop skills in predicting and forecasting future outcomes using stochastic models | Random walk and Absorbing barriers. | Lecture, discussion. | Exams, assignments, and reports. |
| 11 | 4 | Apply stochastic processes to model and solve problems | Higher transition probabilities (derivation of Chapman-Kolmogorov equation). | Lecture, discussion. | Exams, assignments, and reports. |
| 12 | 4 | Apply stochastic processes to model and solve problems | Initial distribution and Probability Distribution. | Lecture, discussion. | Exams, assignments, and reports. |
| 13 | 4 | Gain proficiency in using computational tools and programming languages | Transition Diagram and Transition tree with application and examples of M.C. | Lecture, discussion. | Exams, assignments, and reports. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Muthanna Subhi Sulaiman**

**Academic title: Asst. Prof.**

**Academic qualification: Ph.D.**

**Email:**
**muthanna.sulaiman@uomosul.edu.iq**

**Stage : Forth**

**Subject: Stochastics Processes (1)**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | to simulate and analyze stochastic processes | | | |
| 14 | 4 | Gain proficiency in using computational tools and programming languages to simulate and analyze stochastic processes | Two-state Markov chain. | Lecture, discussion. | Exams, assignments, and reports. |
| 15 | 4 | Gain proficiency in using computational tools and programming languages to simulate and analyze stochastic processes | Introduction to classification of Markov chain. | Lecture, discussion. | Exams, assignments, and reports. |

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc , 40+60

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Al-Rubaie, Fadel Mohsen and Abd, Salah Hamza, (2000), "Introduction to Stochastic Processes." Dar-Books and Documents, Baghdad. |
| Main references (sources) | • Cox D.R &H.D. Miller, "The theory of stochastic process", 1985.<br>• Parzen," Stochastic Process", 1962.<br>• Ross, S. M. (1983), ''Stochastic Processes" Wiley, New York. |
| Recommended books and references (scientific journals, reports…) | Thanoun, Basil Younis, (2011), "Markovian Modeling with Practical Applications." Dar Ibn Al-Atheer for Printing and Publishing, University of Mosul, Iraq. Part one and two. |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**

**Subject: Statistical Inference**

# For the academic year 2022-2023
# Course Description Form

## 1. Course Name:

D/ Statistical inference(1)/First phase

## 2. Course Code:

CMSI23-F2251

## 3. Available Attendance Forms:

Classrooms of department statistics and informatics

## 4. Number of Credit Hours (Total) / Number of Units (Total)

theoretical hours and (1) discussion hours/number of units: 3 (3)

## 5. Course Objectives

| | |
|---|---|
| **Course Objectives** | • Identify properties of a good estimators .1<br>• 2.Learn about point Estimation methods |

## 6. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | Gaining the ability to know the properties of the estimator in terms of Unbiasedness ,consistency, efficiency, etc<br>2-Developing the skull to compere statistical estimators using statistical criteria<br>Acquire the ability to find point estimator for probability distribution parameter3- |

## 7. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 3(T),1(D) | Recognizing the concepts of parameter, random variable, sample space, and parameter space | Introduction to statistics inferential | Black board | |
| **Week 2** | 3(T),1(D) | Study of the non-bias property with examples of estimators of parameters of some | Unbiased property | Black board | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**

**Subject: Statistical Inference**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | discrete and continuous distributions | | | |
| **Week 3** | 3(T),1(D) | Studying the mean square error and using it to compare estimators with examples | . Mean square error | Blackborad | |
| **Week 4** | 3(T),1(D) | Study of the consistency property with examples of estimators of the parameters of some continuous and discrete distributions | Consistency properly | Blackboard | Daily and monthly exams |
| **Week 5** | 3(T),1(D) | Study of the adequacy property by the conditional probability method with examples of estimators of the parameters of some continuous and discrete distributions . | Sufficincy property conditional probability method | Blackboard | Daily and monthly exams |
| **Week 6** | 3(T),1(D) | Studying the adequacy property by factoring method and how to find the sufficient estimator with examples of estimators of the parameters of some probability distributions . | The adequacy property is a factorisation method | Blackboard | Daily and monthly exams |
| **Week 7** | 3(T),1(D) | Studying the property | Sufficiency property Exponetail family method | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**

**Subject: Statistical Inference**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | of adequacy by likening the probability distribution to the exponential family and finding a sufficient estimator with examples of estimators of the parameters of some probability .distributions | | | |
| **Week 8** | 3(T),1(D) | Studying the efficiency property by likening the probability distribution to the exponential family and finding an adequate estimator with examples of estimators of the parameters of some probability ~~~~ distributions | Semester exam | Blackboard | Daily and monthly exams |
| **Week 9** | 3(T),1(D) | Study of the efficiency property, Fisher information, and how to know the efficiency of the estimator, as well as the comparison between two estimators | Efficiency property | Blackboard | Daily and monthly exams |
| **Week 10** | 3(T),1(D) | . Study of Cramer-Rao's inequality and its use in studying the property | Cramer -Raw inqality | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**

**Subject: Statistical Inference**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | of the unbiased estimator with minimal variance | | | |
| **Week 11** | 3(T),1(D) | Study of point estimation methods and their properties ~~ | Some point Estimation method | Blackboard | Daily and monthly exams |
| **Week 12** | 3(T),1(D) | Study of estimation ~~ by the method of moments with examples | Estimation using the method of moment | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 3(T),1(D) | Study of estimation by the maximum likelihood method with examples | Maximum likelihood Estimation | Blackboard | Daily and monthly exams |
| | | | | | |
| | | . | | | |

## 8. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 9. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Methods for solving differential equations / written by Khaled Al-Samarrai |
| Main references (sources) | Engineering Mathematics / Written by Khaled Abdel Hamid Al-Nouri |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**
**Subject: Statistical Inference**

# For the academic year 2022-2023
# Course Description Form

| | |
|---|---|
| 1. Course Name: D/ Statistical inference(2)/First phase | |
| 2. Course Code: | |
| CMSI23-F2251 | |
| 3. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 4. Number of Credit Hours (Total) / Number of Units (Total) | |
| 3theoretical hours and 1 discussion hours/number of units: 3 | |
| 5. Course Objectives | |
| **Course Objectives** | • Objectives of the study material 1. Identify how to construct confidence intervals for mean and variance parameters~~ 2. Learn about testing statistical hypotheses from a theoretical and applied aspect~~ 3. Learn how to calculate errors of the first and second types |
| 6. Teaching and Learning Strategies | |
| **Strategy** | 1 – Acquiring the ability to know how to find confidence intervals for the mean and variance~~2 – Developing the skill to test statistical hypotheses, determining the critical region, and calculating errors of the first and second types~~~~3 – Acquiring the ability to find the best critical region |

7. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 3(T),1(D) | Learn about point and interval estimation methods | Introduction about estimation Theory | Blackboard | Daily and monthly exams |
| **Week 2** | 3(T),1(D) | Explain how to construct confidence intervals | Interval estimation | Blackboard | Daily and monthly exams |
| **Week 3** | 3(T),1(D) | Illustrate how to construct a confidence interval about mean | Interval estimation about mean | Blackboard | Daily and monthly exams |
| **Week 4** | 3(T),1(D) | Explain how to form a | Interval estimation for | Blackboard | Daily and |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**

**Subject: Statistical Inference**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | confidence interval for the difference between two means from two natural populations in the case of known and unknown variance and the sample size is small and large with the drawing | difference between two means | | monthly exams |
| **Week 5** | 3(T),1(D) | Explain how to construct the confidence interval for the variance in the case of a known and unknown population mean with a drawing | Interval Estimation for variances | Blackboard | Daily and monthly exams |
| **Week 6** | 3(T),1(D) | Illustrate how to construct a confidence interval for a ratio between two variances with a diagram | Interval estimation for ratio between two variances | Blackboard | Daily and monthly exams |
| **Week 7** | 3(T),1(D) | . | Example | Blackboard | Daily and monthly exams |
| **Week 8** | 3(T),1(D) | Derivation of the power function law and its relationship with errors of the first and second ~~~~types | Power function | Blackboard | Daily and monthly exams |
| **Week 9** | 3(T),1(D) | | Examples | Blackboard | Daily and monthly exams |
| **Week 10** | 3(T),1(D) | Derivation of a law for this function and its relationship with the power and error function of the first and second kindDerivation of a law for this function and its relationship with the | Operating characteristic function | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Raya**

**Academic title: prof.assistant**

**Academic qualification: Ph.D.**

**Email:**
rayasalim73@uomosul.edu.iq

**Stage : FOURTH**

**Subject: Statistical Inference**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | power and error function of the first and second kind | | | |
| **Week 11** | 3(T),1(D) | | Examples | Blackboard | Daily and monthly exams |
| **Week 12** | 3(T),1(D) | Finding the best critical region based on the ratio between two weighting functions | Best critical region | Blackboard | Daily and monthly exams |
| **Week 13** | 3(t),1(d) | Choosing the statistical hypothesis sequentially based on observations instead of taking the entire sample | Sequential test | Blackboard | Daily and monthly exams |
| | | | | | |
| | | | | | |

## 8. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 9. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Methods for solving differential equations / written by Khaled Al-Samarrai |
| Main references (sources) | Engineering Mathematics / Written by Khaled Abdel Hamid Al-Nouri |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: | |
|---|---|
| English Language / Fourth stage | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: | |
| The second academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours /number of units: 2 | |
| 6. Course Objectives | |
| **Course Objectives** | • To be able to speak English fluently and accurately.<br>• To think in English and then speak.<br>• To be able to talk in English.<br>• To be able to compose freely and independently in speech and writing.<br>• To be able to read books with understanding. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in developing the four skills:<br>The skill of speaking,<br>The skill of reading, |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | |
|---|---|
| | The skill of writing,<br><br>The skill of listening,<br><br>Also, it enables the students for the use grammar correctly, |

## 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical | Reading passage: Are You Getting Enough Sleep? | Reading passage: Are You Getting Enough Sleep? | Blackboard | Daily and monthly exams |
| **Week 2** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major | Blackboard | Daily and monthly exams |
| **Week 3** | 2 theoretical | 9. Reading passage: Mika's Homestay in London.<br>• Students would explain their assignments about their major. | • Reading passage: Mika's Homestay in London.<br>• Students | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | would explain their assignments about their major. | | |
| **Week 4** | 2 theoretical | • Building Vocabulary<br>  • Doing exercises: A-B<br>  • Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 5** | 2 theoretical | • Reading passage: It's Not Always Black and White.<br>10. Students would explain their assignments about their major. | • Reading passage: It's Not Always Black and White.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 6** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short | • Building Vocabulary<br>• Doing exercises: A | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | | |
| **Week 7** | 2 theoretical | • Reading passage: Helping Others.<br>1. Students would explain their assignments about their major.<br>2. | • Reading passage: Helping Others.<br>• Students would explain their assignments about their major.<br>• | Blackboard | Daily and monthly exams |
| **Week 8** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | and use technical terminologies to enhance their English within their major. | | |
| **Week 9** | 2 theoretical | • Reading passage: Generation Z: Digital Nations.<br>11. Students would explain their assignments about their major. | • Reading passage: Generation Z: Digital Nations.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 10** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 11** | 2 | • Reading passage: How to Be a Successful | • Reading passage: How to Be | Blackboard | Daily and |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | theoretical | Businessperson.<br>• Students would explain their assignments about their major. | a Successful Businessperson.<br>• Students would explain their assignments about their major. | | monthly exams |
| **Week 12** | 2 theoretical | Mid-term Exam. | Mid-term Exam. | Blackboard | Daily and monthly exams |
| **Week 13** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 14** | 2 theoretical | 12. Reading passage: The Growth of Urban Farming.<br>13. Students would explain their assignments about their major. | • Reading passage: The Growth of Urban Farming.<br>• Students would explain their | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | assignments about their major. | | |
| **Week 15** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |

## 14. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 15. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Select Readings<br>Teacher-approved readings for today's students<br>pre-intermediate<br>2nd Ed. By: Linda Lee + Eric Gundersen |
| Main references | Select Readings Elementary |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | |
|---|---|
| (sources) | |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | https://www.libgen.is/search.php?req=select+readings+pre-intermediate&open=0&res=25&view=simple&phrase=1&column=def |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

## For the academic year 2022-2023
## Course Description Form

| |
|---|
| 1. Course Name: |
| Intelligent techniques |
| 2. Course Code: |
| CMSI23-F4251 |
| 3. Semester / Year: |
| second semester / year 2022−2023 |
| 4. Available Attendance Forms: |
| Attendance in the classroom |
| 5. Number of Credit Hours (Total) / Number of Units (Total) |
| Number of study hours (4) / Number of units (3) |
| 6. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **• Understand the basics of artificial intelligence and its sub-fields.**<br>**• Enable the student to solve some statistical problems using artificial intelligence algorithms represented by artificial neural networks**<br>**• Explore real-world applications of AI across various industries. Understand the basics of artificial intelligence and its sub-fields.**<br>**• The student should be able to describe the models and algorithms used in artificial neural networks**<br>**• Studying the most important modern intelligent technologies**<br>**Writing special programs in neural networks**<br>**• Study neural networks, the most important algorithms and genetic algorithm** |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

## 7. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | If the student successfully completes this course, he will be able to:<br>1- Knowing the importance of artificial intelligence applications<br>2- Writing special programs in neural networks and algorithms<br>3- Learn about open-loop, closed-loop, single-layer and multi-layer artificial neu networks<br>4- Explains the most important applications of artificial neural networks and gen algorithms.<br>5- Explains the benefits and drawbacks of applications of artificial neural networks genetic algorithms<br>6- Enabling the student to solve some statistical problems using artificial intellige algorithms<br>7 – Enabling the student to write programs for artificial intelligence |

## 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 3 | The student will be able to understand and know artificial intelligence | Introduction to rtificial intelligence<br>Artificial intelligence applications<br>Fields of artificial intelligence | Classroom + blackboard + data show | Exam |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | The student will be able to understand and know artificial neural networks | Introduction to artificial neural networks<br>Its properties, applications, and relationship to the biological network | Classroom + blackboard + data show | Exam |
| 3 | 3 | The student will be able to understand and know transformation functions | Components of neural networks, activation or transformation functions with application examples + programming in the Matlab language | Classroom +blackboard + data show | Exam |
| 4 | 3 | Neural network architecture | Single Layer Networks<br>recurrent neural networks<br>Multi-layer networks<br>with examples | Classroom +blackboard + data show | Homework |
| 5 | 3 | Neural networks | - Methods of teaching intelligent | Classroom + blackboard + data show + | Homework |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | | neural network<br>- Supervised education<br>- Unsupervised education<br>- Reinforcing education | calculator lab | |
| 6 | 3 | The student will be able to understand and draw types of neural networks | Examples of how to draw different types of neural networks<br>,Logic gates<br>Application on MATLAB | Classroom + blackboard + data show + calculator lab | discussion |
| 7 | 3 | The student will be able to understand neural network algorithms | Mc Culloch-Pitts Neuron | Classroom + blackboard + data show + calculator lab | Exam |
| 8 | 3 | The student will be able to understand neural network algorithms | Examples of a network<br>Mc Culloch-Pitts Neuron<br>Application to MATLAB | Classroom + blackboard + data show + calculator lab | discussion |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| 9 | 3 | The student will be able to understand neural network algorithms | Perceptron network algorithm | Classroom + blackboard + data show + calculator lab | Homework |
| 10 | 3 | The student will be able to understand neural network algorithms | Examples of perceptron network algorithm | Classroom | Exam |
| 11 | 3 | The student will be able to understand neural network algorithms | Exam | Classroom + blackboard + data show + calculator lab | discussion |
| 12 | 3 | The student will be able to understand neural networks | Error back propagation algorithm | Classroom + blackboard + data show + calculator lab | discussion |
| 13 | 3 | The student will be able to understand neural network algorithms | Examples of error back propagation network | Classroom + blackboard + data show + calculator lab | Reports |
| 14 | 3 | The student will be able to | Definition of | Classroom + blackboard + | Exam |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | understand genetic algorithm | genetic algorithm<br>Steps of genetic algorithm<br>Genetic algorithm terminology<br>Creation of chromosomes | data show + calculator lab | |
| 15 | 3 | The student will be able to understand genetic algorithm | - Boom<br>Mathematical examples of genetic algorithm | Classroom + blackboard + data show + calculator lab | General questions and discussion + achievement test |

| 9. Course Evaluation |
|---|
| 20 marks monthly exam ;5 marks daily exam ;5 grade exam reports<br>5 marks exam assignments ;5 marks for oral exam ;10 marks laboratory practical exam ; 50 marks for the final exam of the course |

| 10. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | Nothing |
| Main references (sources) | Jeannette Lawrence, "Inrtoduction to neural networks", 5th edition, 1993.<br>Jacek Zurada , “Introduction to Artificial Neural |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:dr.omar salim ibrahim**

**Academic title: teacher**

**Academic qualification: Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | |
|---|---|
| | Systems", 1st edition, 1994.<br><br>S.N. Sivanadam and S.N. Deepa, "Introduction to Genetic Algorithm", 1st edition, 2007. |
| Recommended books and references (scientific journals, reports…) | Dr. S. N. Sivanandam and Dr. M. Paulraj, "Introduction to Artificial Neural Networks", Vikas Publishing House PVT LTD, 2003.<br><br>Fakhreddine O. Karray and Clarence De Silva, "Soft computing and Intellegent System Design", 2004. |
| Electronic References, Websites | Nothing |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :4th**

**Subject: Data mining (2)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023
## Course Description Form

| |
|---|
| 1. Course Name: |
| **Data mining (2)** |
| 2. Course Code: |
| **CMSI23-F4151** |
| 3. Semester / Year: |
| **Course 1\ 2022–2023** |
| 4. Description Preparation Date: |
| **20\ 02\ 2023** |
| 5. Available Attendance Forms: |
| **Attendance+Examination** |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| **2 + 2 Practice** |
| 7. Course administrator's name (mention all, if more than one name) |

| | |
|---|---|
| Name: Ass. Prof. Dr. Osamah Basheer Shukur<br>Email: drosamahannon@uomosul.edu | Name: Lec. Dr. Nur Nawzat |

| |
|---|
| 8. Course Objectives |
| **It is considered a complement to Data Mining (1) and aims to specialize more in d mining concepts and methods.** |
| 9. Teaching and Learning Strategies |
| **Developing students on data mining, classification, and clustering by using statistical and machine learning methods** |
| 10. Course Structure |

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| Week 1 | 2 | | Extracting Rules from Groups | Blackboard and PowerPoint | Assignment |
| Week 2 | 2 | | Decision Trees | Blackboard | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :4th**

**Subject: Data mining (2)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | | **and PowerPoint** | |
| **Week 3** | 2 | | **Splitting criteria** | **Blackboard and PowerPoint** | |
| **Week 4** | 2 | | **Examples of solution** | **Blackboard and PowerPoint** | |
| **Week 5** | 2 | | **Classification** | **Blackboard and PowerPoint** | |
| **Week 6** | 2 | | **Linear simple regression** | **Blackboard and PowerPoint** | |
| **Week 7** | 2 | | **Examples of solution** | **Blackboard and PowerPoint** | Assignment |
| **Week 8** | 1st Mid-course Exam | | | | |
| **Week 9** | 2 | | **Multiple linear regression** | **Blackboard and PowerPoint** | Assignment |
| **Week 10** | 2 | | **Classification and regression trees** | **Blackboard and PowerPoint** | |
| **Week 11** | 2 | | **Logistic Regression** | **Blackboard and PowerPoint** | |
| **Week 12** | 2 | | **Neural Networks** | **Blackboard and PowerPoint** | |
| **Week 13** | 2nd Mid-course Exam | | | | |
| **Week 14** | 2 | | **Time series data mining** | | |
| **Week 15** | 2 | | **Case study** | | |
| 11.Course Evaluation | | | | | |
| **40 for mid-course exam, 60 for final exam** | | | | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :4th**

**Subject: Data mining (2)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023

| 12. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports…) | **Giudici, P. (2005).** ***Applied data mining: statistical methods for business and industry*****. John Wiley & Sons.**<br>**Nisbet, R., Elder, J., & Miner, G. (2009).** ***Handbook of statistical analysis and data mining applications*****. Academic press.** |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

## For the academic year 2022-2023
## Course Description Form

| |
|---|
| 1. Course Name: |
| Simulation |
| 2. Course Code: |
| CMSI23-F4161 |
| 3. Semester / Year: |
| First semester / year 2022−2023 |
| 4. Available Attendance Forms: |
| Attendance in the classroom |
| 5. Number of Credit Hours (Total) / Number of Units (Total) |
| Number of study hours (3) / Number of units (3) |
| 6. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • It aims to present concepts about simulation<br>• Intermittent event simulation<br>• Generating random numbers according to certain probability functions<br>• The student will be able to generate data from continuous and discrete distributions using MATLAB programming to practice simulation<br>• Students' ability to understand statistical models in simulation and program them |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| 7. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | Study of simulation, starting with the introduction, basic definitions, and how to perfo manual simulation of some problems<br>The student will be able to understand and know the simulation<br>Devise appropriate methods to solve statistical problems<br>Able to generate random numbers manually<br>Able to generate random numbers using statistical software<br>The student devises appropriate methods to solve the problems he faces in data analysi<br>Adds his knowledge of statistical programming to solve problems<br>He communicates effectively with his colleagues while working on the computer completing assignments |

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 3 | The student will be able to understand and learn about the simulation | Introduction to modeling and simulation | Classroom + blackboard + data show | Exam |
| 2 | 3 | The student will be able to understand and learn about the | Characteristics of simulation models/simulation model/simulation | Classroom + blackboard + data show | Exam |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | simulation | objectives/disadvantages and advantages of simulation | | |
| 3 | 3 | The student will be able to understand and learn about the simulation | Areas of simulation application / steps in simulation studying / simulation programs / simulation methods | Classroom +blackboard + data show | Exam |
| 4 | 3 | Able to generate random numbers manually | Generating Random namber /methods of generating random numbers with examples of each method and programming in the Matlab language | Classroom +blackboard + data show | Homework |
| 5 | 3 | Able to generate random numbers manually | Linear congenital method / inverse method / inverse transformation method in the case of discrete random variables | Classroom + blackboard + data show + calculator lab | Homework |
| 6 | 3 | He communicates effectively with his colleagues while working on the | The inverse transformation method in the case of continuous random variables with example | Classroom + blackboard + data show + calculator lab | discussion |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | computer and completing assignments | | | |
| 7 | 3 | Able to generate random numbers manually and using statistical software | Distributions and Simulation Random Variable Generation for Continuous Distributions | Classroom + blackboard + data show + calculator lab | Exam |
| 8 | 3 | Able to generate random numbers manually and using statistical software | ;Distributions and Simulation Random Variable Generation for Continuous Distributions | Classroom + blackboard + data show + calculator lab | discussion |
| 9 | 3 | Able to generate random numbers manually | Generating random numbers using two functions | Classroom + blackboard + data show + calculator lab | Homework |
| 10 | 3 | Able to solve problems | Midterm Exam | Classroom | Exam |
| 11 | 3 | Able to generate | Random Variable Generation for Discrete | Classroom + blackboard + | discussion |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | random numbers manually and using statistical software | Distributions | data show + calculator lab | |
| 12 | 3 | Able to generate random numbers manually and using statistical software | Random Variable Generation for Discrete Distributions | Classroom + blackboard + data show + calculator lab | discussion |
| 13 | 3 | He uses his knowledge of statistical programming to solve problems<br>He communicates effectively with his colleagues while working on the computer and completing assignments | Methods for generating continuous and discrete distributions using ready-made functions in MATLAB + learning generation using the ready-made program Minitab | Classroom + blackboard + data show + calculator lab | Reports |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| 14 | 3 | The student devises appropriate methods to solve the problems he faces in data analysis | Methods for testing random numbers | Classroom + blackboard + data show + calculator lab | Exam |
| 15 | 3 | The student devises appropriate methods to solve the problems he faces in data analysis | Examples of generating random numbers with three different probability functions, continuous and discrete Simulation Methods / box moller | Classroom + blackboard + data show + calculator lab | Exam |

9. Course Evaluation

20 marks monthly exam

5 marks daily exam

5 grade exam reports

5 marks exam assignments

5 marks for oral exam

60 marks for the final exam of the course

100 Final grade

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:Dr.omar salim ibrahim**

**Academic title:teacher**

**Academic qualification:Ph.D.**

**Email:** omarsalim85@uomosul.edu.iq

**Stage : Fourth**

**Subject:** Simulation

**For the academic year 2022-2023**

| 10. Learning and Teaching Resources | |
|---|---|
| quired textbooks (curricular books, if any) | n introduction to computer stochastic simulation and its modeling using MATLAB, Dr. Basil Younis |
| Main references (sources) | screte-Event System Simulation", Banks Carson "II Nelson Nicol, Fifth Edition |
| Recommended books and references (scientific journals, reports…) | nothing |
| Electronic References, Websites | nothing |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023
## Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| English Language / Fourth stage | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: | |
| The second academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours /number of units: 2 | |
| 6. Course Objectives | |
| **Course Objectives** | • To be able to speak English fluently and accurately.<br>• To think in English and then speak.<br>• To be able to talk in English.<br>• To be able to compose freely and independently in speech and writing.<br>• To be able to read books with understanding. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in developing the four skills:<br>The skill of speaking,<br>The skill of reading,<br>The skill of writing, |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | |
|---|---|
| | The skill of listening,<br><br>Also, it enables the students for the use grammar correctly, |

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical | Reading passage: Are You Getting Enough Sleep? | Reading passage: Are You Getting Enough Sleep? | Blackboard | Daily and monthly exams |
| **Week 2** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major | Blackboard | Daily and monthly exams |
| **Week 3** | 2 theoretical | 9. Reading passage: Mika's Homestay in London.<br>• Students would explain their assignments about their major. | • Reading passage: Mika's Homestay in London.<br>• Students would explain their assignments | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | about their major. | | |
| **Week 4** | 2 theoretical | • Building Vocabulary<br>  • Doing exercises: A-B<br>  • Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 5** | 2 theoretical | • Reading passage: It's Not Always Black and White.<br>10. Students would explain their assignments about their major. | • Reading passage: It's Not Always Black and White.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 6** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | terminologies to enhance their English within their major. | (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | | |
| **Week 7** | 2 theoretical | • Reading passage: Helping Others.<br>1. Students would explain their assignments about their major.<br>2. | • Reading passage: Helping Others.<br>• Students would explain their assignments about their major.<br>• | Blackboard | Daily and monthly exams |
| **Week 8** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | English within their major. | | |
| **Week 9** | 2 theoretical | • Reading passage: Generation Z: Digital Nations.<br>11. Students would explain their assignments about their major. | • Reading passage: Generation Z: Digital Nations.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 10** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 11** | 2 theoretical | • Reading passage: How to Be a Successful Businessperson.<br>• Students would explain their assignments about | • Reading passage: How to Be a Successful Businessperson.<br>• Students | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | their major. | would explain their assignments about their major. | | |
| **Week 12** | 2 theoretical | Mid-term Exam. | Mid-term Exam. | Blackboard | Daily and monthly exams |
| **Week 13** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 14** | 2 theoretical | 12. Reading passage: The Growth of Urban Farming.<br>13. Students would explain their assignments about their major. | • Reading passage: The Growth of Urban Farming.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 15** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |

## 14.Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 15.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Select Readings<br>Teacher-approved readings for today's students<br>pre-intermediate<br>2nd Ed. By: Linda Lee + Eric Gundersen |
| Main references (sources) | Select Readings Elementary |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, | https://www.libgen.is/search.php?req=select+readings+pre-intermediate&open=0&res=25&view=simple&phrase=1&column=def |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : **Fourth**

**Subject: English Language**

## For the academic year 2022-2023

| | |
|---|---|
| Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**
**Course Description Form**

| | |
|---|---|
| 1. Course Name: | |
| Mathematical Statistics I | |
| 2. Course Code: | |
| CMSI23-F3111 | |
| 3. Semester / Year: | |
| First semester | |
| 4. Description Preparation Date: | |
| February 10th 2023 | |
| 5. Available Attendance Forms: | |
| In-class | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| Lecture hours: 3 hours, Recitation: 1 hour, Credit: 3 Credit | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Dr. Hayfa Abdul Jawad Saieed<br>Email: hayfaajwad.65@uomosul.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | 1. Explain probability mass, density, cumulative distribution function joint density, mass, and cumulative functions with their properties<br>2. Identify different moments of a single variable and their properties and relations between moments |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| | 3. Identifying generating functions and cumulants with their uses and properties<br><br>4. Learn about important measures such as median, modes, harmonic mean, variance, mean deviation, and coefficient of variation. These measures are essential in studying statistical properties of discrete and continuous distributions Which the student will study in Mathematical Statistics 2 in the second course.<br><br>5. Learning joint probability functions, marginal and conditional probability functions, joint, marginal, conditional moments, joint generating functions, and cumulants.<br><br>6. Defining theoretical joint measures such as covariance, simple correlation, and partial correlation coefficients. |
| 9. Teaching and Learning Strategies | |
| Strategy | Encouraging students to participate in the class through discussion and solving exercises, while improving and expanding their critical thinking skills through reports and using software to calculate cumulative probabilities, moments, or drawing probability functions. Also linking the knowledge, they receive with the subjects that they studied previous levels and the levels that they will turn to later. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| Week 1 | 4 | Probability mass an density function Cumulative distributio function with properties | Lecture_01 | Lecture | Homework |
| Week 2 | 4 | Mathematical expectatio with properties, Momen around zero, central an non-central moment factorial moments | Lecture_02 | Lecture | Homework |
| Week 3 | 4 | Moment generatin function, characteristi function with properties | Lecture_03 | Lecture | Homework |
| Week 4 | 4 | Probability generatin function, cumular generating function | Lecture_04 | Lecture | Homework |
| Week 5 | 4 | Median, Mode Harmonic mea geometric mean | Lecture_05 | Lecture | Homework |
| Week 6 | 4 | Mean deviation, varianc with properties | Lecture_06 | Lecture | Homework |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| Week 7 | 4 | Midterm exam | --- | --- | Test |
| Week 8 | 4 | Joint probability mass an density functions, join cumulative distributio functions | Lecture_07 | Lecture | Homework |
| Week 9 | 4 | Marginal density, mass cumulative functions | Lecture_08 | Lecture | Homework |
| Week 10 | 4 | Joint moments, margina moments, independence | Lecture_09 | Lecture | Homework |
| Week 11 | 4 | Joint moment generating characteristic functior joint cumulant generatin functions and marginals | Lecture_10 | Lecture | Homework |
| Week 12 | 4 | Conditional distributions conditional cumulativ distribution function wit properties | Lecture_11 | Lecture | Homework |
| Week 13 | 4 | Conditional moments | Lecture_12 | Lecture | Homework |
| Week 14 | 4 | Covariance and simpl correlation coefficients | Lecture_13 | Lecture | Homework |
| Week 15 | 4 | Partial correlation wit examples | Lecture_14 | Lecture | Homework |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| Week 16 | 4 | Final exam | --- | --- | Test |

11.Course Evaluation

Quizzes: 2 (worth 10%)

Assignments: 2 (worth 10%)

Open-book exams: 5 (worth 10%)

Reports: 1 (worth 10%)

Midterm Exam: 1 (worth 10%)

Final Exam: 1 (worth 50%)

12.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if ar | Hermiz,A.H.(1989),"Mathematical Statistics ", Directorate of Dar Al-Kutub Printing and Publishing, University Mosul, Iraq |
| Main references (sources) | School, P., Louisville, KY, (201 "Probability and mathematical statistics" |
| Recommended books and references (scientific journals, reports...) | Hog, R.V. and Craig, A.T. (1978 Introduction to mathematical statistics fourth edition, Macmillan Publishing C Inc. NEW YORK |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Mathematical Statistics II | |
| 2. Course Code: | |
| CMSI23-F3111 | |
| 3. Semester / Year: | |
| Second semester | |
| 4. Description Preparation Date: | |
| February 10th 2023 | |
| 5. Available Attendance Forms: | |
| In-class | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| Lecture hours: 3 hours, Recitation: 1 hour, Credit: 3 Credit | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Dr. Hayfa Abdul Jawad Saieed<br>Email: hayfaajwad.65@uomosul.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | 1. Applying all the vocabulary of mathematical statistics 1 to discrete and continuous distributions.<br>2. Recognizing the applications of each distribution. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| | 3. Studying the distributions of linear combinations of single and mor than one independent variable by using mgf, cdf, and transformation techniques.<br><br>4. Studying the importance of sampling distributions in different field of statistics especially confidence intervals and hypothesis testing.<br><br>5. Studying the importance of order statistics and their distributions a properties.<br><br>6. Studying the importance of the central limit theorem which important in studying distributions of estimators, tests, and oth properties in large samples. |
| 9. Teaching and Learning Strategies | |
| Strategy | Encouraging students to participate in the class through discussion a solving exercises, while improving and expanding their critical thinki skills through reports and using software to calculate cumulat probabilities, moments, or drawing probability functions. Also linki the knowledge, they receive with the subjects that they studied previous levels and the levels that they will turn to later. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| Week 1 | 4 | Discrete distributions Uniform and Bernoul distribution. | Lecture_01 | Lecture | Homework |
| Week 2 | 4 | Binomial distribution. | Lecture_02 | Lecture | Homework |
| Week 3 | 4 | Poisson distribution | Lecture_03 | Lecture | Homework |
| Week 4 | 4 | Geometric distribution. | Lecture_04 | Lecture | Homework |
| Week 5 | 4 | Continuous distributions uniform Distributio Methods of findin distribution of functions o random variables. | Lecture_05 | Lecture | Homework |
| Week 6 | 4 | Normal distribution. | Lecture_06 | Lecture | Homework |
| Week 7 | 4 | Midterm exam | --- | --- | Test |
| Week 8 | 4 | Gamma distribution | Lecture_07 | Lecture | Homework |
| Week 9 | 4 | Distributions of nonlinea functions of independer continuous randor variables. | Lecture_08 | Lecture | Homework |
| Week 10 | 4 | Transformation techniqu in discrete distributions | Lecture_09 | Lecture | Homework |
| Week 11 | 4 | Chi square distribution | Lecture_10 | Lecture | Homework |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| Week 12 | 4 | Student t distribution | Lecture_11 | Lecture | Homework |
| Week 13 | 4 | F distribution | Lecture_12 | Lecture | Homework |
| Week 14 | 4 | Order statistics distribution of single order statistic. | Lecture_13 | Lecture | Homework |
| Week 15 | 4 | Distribution of function of order statistics. | Lecture_14 | Lecture | Homework |
| Week 16 | 4 | Final Exam | --- | --- | Test |

11.Course Evaluation

Quizzes: 2 (worth 10%)

Assignments: 2 (worth 10%)

Open-book exams: 5 (worth 10%)

Reports: 1 (worth 10%)

Midterm Exam: 1 (worth 10%)

Final Exam: 1 (worth 50%)

12.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if an | Hermiz,A.H.(1989),"Mathematical Statistics ", Directorate of Dar Al-Kutub Printing and Publishing, University Mosul, Iraq |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Hayfa Abdul Jawad Saieed**

**Academic title: Assistant professor**

**Academic qualification: PhD**

**Email: hayfaajwad.65@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Mathematical Statistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| Main references (sources) | School, P., Louisville, KY, (201 "Probability and mathematical statistics" |
| Recommended books and references (scientific journals, reports...) | Hog, R.V. and Craig, A.T. (1978 Introduction to mathematical statistics fourth edition, Macmillan Publishing C Inc. NEW YORK |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

Course Description Form

| |
|---|
| 1. Course Name: |
| Biostatistics 1 |
| 2. Course Code: |
| CMSI23-F31314 |
| 3. Semester / Year: |
| 2022-2023 |
| 4. Description Preparation Date: 15/2/2023 |
| |
| 5. Available Attendance Forms: |
| |
| 6. Number of Credit Hours (Total) / Number of Units (Total): |
| (3) / (2) |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Mhasen Saleh Altalib<br>Email: mhasenaltalib@uomosul.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| Course Objectives | 1. This course aims to provide the student with basic information and scientific training in the field of biostatistics through the application of many types of important statistical methods in data analysis, especially in the field of science and statistical applications in the field of clinical medicine, as well as benefiting from it in other fields<br>2. Familiarize yourself with the subject of statistical hypothesis testing, when it is applied, the extent to which its results are benefited, and what are the |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| | statistical terms that must be recognized (such as the level of significance, error of the first and second kind, types of hypotheses .....) in order to define the hypothesis and apply it correctly, which leads to a decision Correct decision.<br>3. What is the statistical hypothesis, what does it consist of, and what is its statistical formula.<br>4. Identifying the types of tests: for one community, two communities, or more, and what are the statistical characteristics of this community.<br>5. What are the parameters being tested, mean, ratio or variance...<br>6. Study population data through standard and clinical life tables. |

9. Teaching and Learning Strategies

| | |
|---|---|
| Strategy | Encouraging students to participate in the class throu discussion and solving exercises, while improving and expandi critical thinking skills through reports and using programs calculate the statistical laboratory, as well as linking knowledge they receive with the materials they studied previous levels and the levels they will turn to later. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| First | 3 | 1. There are two possible outcomes of hypothesis testing: The null hypothesis, H0, | Hypothesis testi definitions w general concepts | Live meeting-whiteboard | Daily Exams<br>And a semester exam |
| Second | | | Building hypotheses: the n hypothesis and | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | is rejected, in which case we have evidence that supports the alternative hypothesis. Do not reject the null hypothesis H0, as in this case we do not have sufficient evidence to support the alternative hypothesis.<br>2. Learn about the statistical hypothesis and how to formulate it.<br>3. Errors of the first and second types<br>4. Great level<br>5. Areas of rejecting and accepting the null hypothesis<br>6. The statistical laboratory, its types and uses | alternative hypothesis w testing from c side and from t sides, error of first and secc kind, and the pov of the statisti test. | | |
| Third | | | Test criterion: T steps involved testing hypothesis. | | |
| Fourth | | | Tests related averages: A t related to c average in the c of large samples. | | |
| Fifth | | | Tests related averages: a t related to c average, analy hypotheses a applied examp related to c average test in case of sm samples. | | |
| Sixth | | | Difference of two means | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | 7. Collect data from the sample and calculate its laboratory statistical value<br>8. How to make a decision.<br>9. Types of tests (parametric)<br>For small and large samples.<br>a) Test of means (one mean, two means, more than two means (one-way and two-way analysis of variance))<br>b) Variance testing (single variance, two variances, and multiple variances)<br>C) Proportions test (one ratio, two ratios).<br>D) Testing the variance of communities | tests: The difference between two means using large samples.<br>Z-test | | |
| Seventh | | | Difference of two means tests: The difference between two means using small samples<br>t-test and test the difference between two related means. t-tailed. | | |
| Eight | | | Testing difference betwe more than t means: Introduction- analysis of variar - one-way and tw way. | | |
| Nineth | | | One-way analysis to estimate covariance | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | | model parameters. | | |
| Tenth | | | Two-way analysis of variance and practical examples.<br>A test related to proportions for a population with a binomial distribution - for one sample + applied examples | | |
| Eleventh | | | Test related to proportions for a population with a binomial distribution - for one sample + applied examples. | | |
| Twelfth | | | Testing the difference between two ratios / applied examples.. | | |
| Thirteenth | | | Standard deviation and | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | | variance tests: Testing the variance of a single population. | | |
| Fourteenth | | | A test for homogeneity of variances between two independent estimates. | | |
| Fifteenth | | | Standard deviation and variance tests: A test for the equality of several variances. | | |

| 11.Course Evaluation | |
|---|---|
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | |
| 12.Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | |
| Main references (sources) | 1. Al-Rawi, Khasha'a Mahmoud (1998) "Introduction to the Principles of Statistics", first edition, Ibn Al-Atheer Press, University of Mosul-Iraq.<br>2. Prof. Kamal Alwan Khalaf and Prof. Dr. Emad Hazim (2009) |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| | "Testing Statistical Hypotheses", Al Jazeera Printing and Publishing Office - Baghdad. |
| Recommended books and references (scientific journals, reports...) | 3e- Daryl S. Paulson, (200 "Biostatistics and Microbiolog Bioscience Labortoies Bozeman, M USA. |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

## Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Biostatistics 2 | |
| 2. Course Code: | |
| CMSI23-G3231 | |
| 3. Semester / Year: | |
| second 2022-2023 | |
| 4. Description Preparation Date: | |
| 15/2/2023 | |
| 5. Available Attendance Forms: | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 3 / 2 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Mhasen Saleh Altalib<br>Email: mhasenaltalib@uomosul.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | 1-This course aims to provide the student with basic information and scientific training in the field of biostatistics through the application of many types of important statistical methods in data analysis, especially in the field of science and statistical applications in the field of clinical medicine, as well as benefiting from it in other fields. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| | 2) Distinguish between vital statistics and vital statistics.<br><br>3) Studying population data through both standard and clinical life tables.<br><br>4) Study the survival data and their statistical distributions and analyze them.<br><br>5) Knowing how to verify the results of laboratory analyzes, the accuracy of these analyzes, and the consistency of results between health units such as hospitals and analysis laboratories.<br><br>6) How to calculate and use the appropriate dose for any vacci treatment, or insecticide, i.e. in general, any medical drug. |
| 9. Teaching and Learning Strategies | |
| Strategy | Encouraging students to participate in the class through discussi and solving exercises, while improving and expanding criti thinking skills through reports and using programs to calculate statistical laboratory, as well as linking the knowledge they rece with the materials they studied in previous levels and the lev they will turn to later. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| First | 3 | 1. Biostatistics is th application of statistic to a wide range of topics in biology. Biostatistics includes designing biological tests, especially in | biostatistics: definitions wit general concepts. | Live meeting-whiteboard | Daily Exams<br><br>And a semester exam |
| Second | 3 | | Birth and deatl rates. | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| Third | 3 | medicine and agriculture, collecting summarizing and analyzing information from these experimen interpreting results an drawing conclusions from them. The terms "biometric" or "biometric" can also b used as synonyms for vital statistics.<br>2. Identify the are of application biostatistics, includin Public health including epidemiolo research, health servic research, nutrition, a environmental healt Medicine - clinical te design and analys Genetics, genetics, a genetic statistics th attempt to rela abnormalities genotype wi phenotype. The resu of these researches we applied in the fields agriculture to impro the quality and quanti | disease rates and Practical examples. | | |
| Fourth | 3 | | Measure of the relationship between life factors - Practical examples. | | |
| Fifth | 3 | | Comparing tw rates of death from a particular cause. | | |
| Sixth | 3 | | Fisher's exact test for comparison of two rates- Practical examples. | | |
| Seventh | 3 | | Usual and clinical life schedule. | | |
| Eight | 3 | | Comparison of two sets of survival data. | | |
| Nineth | 3 | | Comparison of two sets of survival data- | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | of crops and t breeding of far animals. It is applied biomedical research find alleles of a ge responsible for gene diseases.<br>3. Learn about laboratory analyzes and how to verify the validity of their result through some statistical tests.<br>4. How to conduct vital tests, the effectiveness of medical drugs such as vaccine, treatment or pesticide...<br>5. Comparison of death rates for a particular cause.<br>6. Confirming the seriousness of disease and indicating which them is more risk, in addition to studying another reason for increasing this risk.<br>7. Determine the confidence limits for relative severity | Relative Risk estimation for single study with confidenc limits. | | |
| Tenth | 3 | | General relativ risk estimation with confidenc limits- Practica examples | | |
| Eleventh | 3 | | Laboratory analyzes - concordance between the results of two laboratories. | | |
| Twelfth | 3 | | Matching in terms of effectiveness, sensitivity and accuracy. | | |
| Thirteenth | 3 | | Matching in terms of sensitivity and accuracy - double test | | |
| Fourteenth | 3 | | vital tests- Estimate the median dose- | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | 8. Learn how to calculate and use the appropriate dose for any vaccine, treatmen or insecticide, i.e. in general, any medical drug.<br>9. How to determin vital tests- Estimate th median dose.<br>Analyze survival data life function, dea function and haza function, and t relationship betwe these functions. | Practical examples | | |
| Fifteenth | 3 | | Analyze survival data - life function, death function and hazard function, and the relationshi between these functions. | | |

| 11.Course Evaluation |
|---|
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc |

| 12.Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if an | |
| Main references (sources) | 3. Al-Rawi, Khasha'a Mahmoud (1998) "Introduction to the Principles of Statistics", first edition, Ibn Al-Atheer Press, University of Mosul-Iraq.<br>2. Prof. Kamal Alwan Khalaf and Prof. Dr. Em Hazim (2009) "Testing Statisti Hypotheses", Al Jazeera Printing a Publishing Office - Baghdad. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Mhasen Saleh Altalib**

**Academic title: Lecturer**

**Academic qualification: PhD**

**Email: mhasenaltalib@uomosul.edu.iq**

**Stage : 3rd year**
**Subject: Biostatistics 1&2**

**Academic year 2022-2023**

| | |
|---|---|
| Recommended books and references (scientific journals, reports...) | 3e- Daryl S. Paulson, (2008); "Biostatistics a Microbiology" Bioscience Laborto Bozeman, MT, USA. |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Manaf Hazim A.**

**Academic title: Lecturer**

**Academic qualification: Ph.D.**

**Email: manaf.ahmed@uomosul.edu.iq**

**Stage : Third**

**Subject: Queuing Theory**

# For the academic year 2022-2023
# Course Description Form

| 1. Course Name: | |
|---|---|
| Queueing Theory | |
| 2. Course Code: | |
| CMSI23-F3171 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | The objectives of the course are to provide students with fundamental concepts in queueing theory and its practical applications. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | • Understanding key queueing theory terms and concepts, such as arrival rate, service rate, and waiting time.<br>• Studying various queueing models, starting from simple models like M/M/1 and progressing to more complex scenarios.<br>• Practicing problem-solving to reinforce theoretical concepts and compute performance metrics.<br>• Exploring the application of queueing theory in different industries through case studies.<br>• Engaging in hands-on exercises involving the design and optimization of queueing systems. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Manaf Hazim A.**

**Academic title: Lecturer**

**Academic qualification: Ph.D.**

**Email: manaf.ahmed@uomosul.edu.iq**

**Stage : Third**

**Subject: Queuing Theory**

## For the academic year 2022-2023

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Introduction to Queueing Theory | Introduction to Queueing Theory | Blackboard and PowerPoint | Assignment |
| **Week 2** | 2 theoretical + 2 discussion | Characteristics of Queueing Models | Characteristics of Queueing Models | Blackboard and PowerPoint | Assignment |
| **Week 3** | 2 theoretical + 2 discussion | Probability Distributions in Queueing | Probability Distributions in Queueing | Blackboard and PowerPoint | Assignment |
| **Week 4** | 2 theoretical + 2 discussion | Birth and Death Process | Birth and Death Process | Blackboard and PowerPoint | Assignment |
| **Week 5** | 2 theoretical + 2 discussion | Single-Server System / Characteristics of a Single-Server Queue | Single-Server System / Characteristics of a Single-Server Queue | Blackboard and PowerPoint | Assignment |
| **Week 6** | 2 theoretical + 2 discussion | Single-Server System / Steady-State Distribution, Key Performance Indicators | Single-Server System / Steady-State Distribution, Key Performance Indicators | Blackboard and PowerPoint | Assignment |
| **Week 7** | 2 theoretical + 2 discussion | Limited Capacity Single-Server Queueing System / System Probability Distribution, Key Performance Indicators | Limited Capacity Single-Server Queueing System / System Probability Distribution, Key Performance Indicators | Blackboard and PowerPoint | Assignment |
| **Week 8** | 2 theoretical + 2 discussion | Limited Capacity Single-Server Queueing System / System Probability Distribution, Key | Limited Capacity Single-Server Queueing System / System Probability Distribution, Key | Blackboard and PowerPoint | Assignment |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Manaf Hazim A.**

**Academic title: Lecturer**

**Academic qualification: Ph.D.**

**Email: manaf.ahmed@uomosul.edu.iq**

**Stage : Third**

**Subject: Queuing Theory**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | Performance Indicators | Performance Indicators | | |
| **Week 9** | 2 theoretical + 2 discussion | Midterm Exam | Midterm Exam | Blackboard and PowerPoint | exams |
| **Week 10** | 2 theoretical + 2 discussion | Practical Applications on Models | Practical Applications on Models | Blackboard and PowerPoint | Assignment |
| **Week 11** | 2 theoretical + 2 discussion | Multi-Server Queueing System | Multi-Server Queueing System | Blackboard and PowerPoint | Assignment |
| **Week 12** | 2 theoretical + 2 discussion | Multi-Server Queueing System with Limited Capacity / System Probability Distribution, Key Performance Indicators | Multi-Server Queueing System with Limited Capacity / System Probability Distribution, Key Performance Indicators | Blackboard and PowerPoint | Assignment |
| **Week 13** | 2 theoretical + 2 discussion | Multi-Server Queueing System with Limited Capacity and Limited Source of Demand / System Probability Distribution, Key Performance Indicators | Multi-Server Queueing System with Limited Capacity and Limited Source of Demand / System Probability Distribution, Key Performance Indicators | Blackboard and PowerPoint | Assignment |
| **Week 14** | 2 theoretical + 2 discussion | Multi-Server Queueing System / Practical Applications on Models | Multi-Server Queueing System / Practical Applications on Models | Blackboard and PowerPoint | Assignment |
| **Week 15** | 2 theoretical + 2 discussion | Final Project: Discussion of Results | Final Project: Discussion of Results | Blackboard and PowerPoint | Assignment |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr. Manaf Hazim A.**

**Academic title: Lecturer**

**Academic qualification: Ph.D.**

**Email: manaf.ahmed@uomosul.edu.iq**

**Stage : Third**

**Subject: Queuing Theory**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 15** | Final exam | Final Exam | | | Final Exam |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | نظرية الطوابير، د.عدنان عبد الرحمن بري 1989 |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Third**
**Subject: Management of information systems**

## For the academic year 2022-2023

# Course Description Form

| 1. Course Name: |
|---|
| Management of information systems |
| 2. Course Code: |
| CMSI23-F3161 |
| 3. Semester / Year: |
| First course / 2023-2024 |
| 4. Available Attendance Forms: |
| My attendance |
| 5. Number of Credit Hours (Total) / Number of Units (Total) |
| 4 hours/3 units |
| 6. Course administrator's name (mention all, if more than one name) |
| Name: Mahmoud Mohammed Taher Jader Al-Abadi<br>Email: Mahmood81_tahr@uomosul.edu.iq |
| 7. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **• Giving an idea of the importance of business management**<br>**• Methods of scheduling**<br>**• The most important scheduling algorithms** |
| 8. Teaching and Learning Strategies | |
| **Strategy** | The concept of the information system, characteristics of information, the nature of managem information systems, the importance of managing management information systems, schedul standards, system characteristics, single-processor scheduling algorithms, applied examples, precedence scheduling algorithm, advantages that the information system brings to organizati stages of the control and oversight process, the issue of sequences. The main returns achieved the information system are multiprocessor scheduling algorithms, multiprocessor scheduling algorithms without communication cost, algorithms for scheduling linked processes with equa execution times<br>. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Third**
**Subject: Management of information systems**

## For the academic year 2022-2023

## 9. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| First | 4 | The importance of management information systems, terms of management information, direct loop statement model, number of processors, process time | The concept of managen information systems | writing board Data show | Homework |
| Second | 4 | Components of management information systems, statement structure, types of scheduling | Definition of manageme information systems | writing board Data show | Homework |
| Third | 4 | Objectives of management information syste static processor, homogeneous and heterogeneous rocessors | Data processing system | writing board Data show | Homework |
| Fourth | 4 | Characteristics of an ideal information syster single-processor scheduling algorithms, firstcome, first-served scheduling algorithm | Characteristics of an ide information system | writing board Data show | Homework |
| Fifth | 4 | Personnel resources, hardware resources, software resources, data resources, smallest work first scheduling algorithm | Management informatio system resources | writing board Data show | Homework |
| Sixth | 4 | The emergence of the information and knowledge revolution, Internet and network technology, the emergence of electronic business models, the acceleration of quantita and qualitative changes in the business environment, globalization, the precedence scheduling algorithm. | Factors affecting the development of management informatio systems: | writing board Data show | Daily exam |
| Seventh | 4 | Multiprocessor scheduling algorithms, independent process scheduling algorithms, largest time process scheduling algorithm | Management informatio system activities: | writing board Data show | Homework |
| Eighth | 4 | Semester exam | Semester exam | Semester exam | Semester exa |
| Ninth | 4 | Data, information, knowledge, smallest time process scheduling algorithm | The concept of data and information | writing board Data show | Homework |
| Tenth | 4 | Genesis and evolution of,the smallest level-f scheduling algorithm with time estimation | The relationship betwee data and information | writing board Data show | Homework |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Third**
**Subject: Management of information systems**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| Eleventh | 4 | Defining and discovering the problem: diagnosing the problem, analyzing the probl finding alternatives to solve the problem, Evaluate the available alternatives to solve th problem: | Information retrieval systems | writing board Data show | Homework |
| Twelveth | 4 | The concept of information systems strategy the role of the management information syst in achieving competitive advantages | Stages of decision-maki | writing board Data show | Homework |
| Twelfth | 4 | Division of the information systems life cycl management information system activities: | Strategic planning for information systems | writing board Data show | Homework |
| Thirteenth | 4 | The emergence of the information and knowledge revolution, Internet and network technology, and the emergence of electronic business models | Information system life cycle | writing board Data show | Daily exam |
| Fourteenth | 4 | Accelerating quantitative and qualitative changes in the business environment, globalization, and precedence scheduling algorithm | Factors affecting the development of management information systems: | writing board Data show | Homework |

## 10. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

## 11. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | **ادارة نظم المعلومات الادارية** |
| Main references (sources) | الحارث عبد المنعم احمد حمد النيل ، 2019،"نظم المعلومات الادارية" الادارة والاقتصاد ،جامعة شندي<br>مقرر نظم المعلومات الإدارية،جامعة الشام الخاصة،كلية العلوم الإدارية،قسم إدارة الموارد البشرية<br>Abraham, S. and Peter Baer, G. (1998), "**Oprating System Concepts**", Addison-Wesley Publishing Company.<br>AL-Sbawy, A. M. and Mahmood, E. M. (20 "**Construct an Optimal Scheduling for Mult Processors**". |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | الإدارية" المعلومات أبشر،2021، "نظم أحمد المعطى عبد |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Third**

**Subject: Management of information systems**

## For the academic year 2022-2023

| | |
|---|---|
| | https://missystems.blogspot.com/ |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023
## Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| English Language / third stage | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: | |
| The second academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours /number of units: 2 | |
| 6. Course Objectives | |
| **Course Objectives** | • To be able to speak English fluently and accurately.<br>• To think in English and then speak.<br>• To be able to talk in English.<br>• To be able to compose freely and independently in speech and writing.<br>• To be able to read books with understanding. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in developing the four skills:<br>The skill of speaking,<br>The skill of reading,<br>The skill of writing, |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**
**Academic title: Asst. lecturer**
**Academic qualification: MSc.**
**Email:**
**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023

| | |
|---|---|
| | The skill of listening,<br><br>Also, it enables the students for the use grammar correctly, |

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical | Reading passage: Are You Getting Enough Sleep? | Reading passage: Are You Getting Enough Sleep? | Blackboard | Daily and monthly exams |
| **Week 2** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major | Blackboard | Daily and monthly exams |
| **Week 3** | 2 theoretical | 9. Reading passage: Mika's Homestay in London.<br>• Students would explain their assignments about their major. | • Reading passage: Mika's Homestay in London.<br>• Students would explain their assignments about their | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | major. | | |
| **Week 4** | 2 theoretical | • Building Vocabulary<br>  • Doing exercises: A-B<br>  • Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 5** | 2 theoretical | • Reading passage: It's Not Always Black and White.<br>10. Students would explain their assignments about their major. | • Reading passage: It's Not Always Black and White.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 6** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | paragraph or report related to their field and use technical terminologies to enhance their English within their major. | | |
| **Week 7** | 2 theoretical | • Reading passage: Helping Others.<br>1. Students would explain their assignments about their major.<br>2. | • Reading passage: Helping Others.<br>• Students would explain their assignments about their major.<br>• | Blackboard | Daily and monthly exams |
| **Week 8** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 9** | 2 theoretical | • Reading passage: Generation Z: Digital Nations. | • Reading passage: Generation | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | 11. Students would explain their assignments about their major. | Z: Digital Nations.<br>• Students would explain their assignments about their major. | | |
| **Week 10** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 11** | 2 theoretical | • Reading passage: How to Be a Successful Businessperson.<br>• Students would explain their assignments about their major. | • Reading passage: How to Be a Successful Businessperson.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 12** | 2 theoretical | Mid-term Exam. | Mid-term Exam. | Blackboard | Daily and monthly |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | | | exams |
| **Week 13** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | Blackboard | Daily and monthly exams |
| **Week 14** | 2 theoretical | 12. Reading passage: The Growth of Urban Farming.<br>13. Students would explain their assignments about their major. | • Reading passage: The Growth of Urban Farming.<br>• Students would explain their assignments about their major. | Blackboard | Daily and monthly exams |
| **Week 15** | 2 theoretical | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | • Building Vocabulary<br>• Doing exercises: A-B<br>• Words to remember<br>Ask Students (According to attendance list) to | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hajer Akram**

**Academic title: Asst. lecturer**

**Academic qualification: MSc.**

**Email:**

**hajerakram@uomosul.edu.iq**

**Stage** : Third

**Subject: English Language**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | write a short paragraph or report related to their field and use technical terminologies to enhance their English within their major. | | |

## 14. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 15. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Select Readings<br>Teacher-approved readings for today's students<br>pre-intermediate<br>2nd Ed. By: Linda Lee + Eric Gundersen |
| Main references (sources) | Select Readings Elementary |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | https://www.libgen.is/search.php?req=select+readings+pre-intermediate&open=0&res=25&view=simple&phrase=1&column=def |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Third**

**Subject: Reliability**

**For the academic year 2022-2023**

# Course Description Form

| |
|---|
| 1. Course Name: |
| Reliability/Third phase |
| 2. Course Code: |
| CMSI24-F3141 |
| 3. Semester / Year: |
| The first course/2023/2024 |
| 4. Description Preparation Date: |
| **17/2/2024** |
| 5. Available Attendance Forms: |
| Classrooms of department statistical and informatics |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| (3) theoretical hours and (1) discussion hours/number of units: 3 |
| 7. Course administrator's name (mention all, if more than one name) |
| **Name: Dr.Khalida Ahmed Mohammed Email: khalida@uomosul.edu.iq**<br>**Name :Naam Salem Email:naamsalem@uomosul.edu.iq** |
| **8.** |

| | |
|---|---|
| **Course Objectives** | **Explain all the functions related of reliability. Define the importance lifetime distributions then compute all the function related of(reliability ,MTTF,median time to failure ,mode design life…ext).Compute reliability function of systems(series,parallel and companied).**<br>• |
| 9. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials by by taking applied examples in the field of engineering reliability |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Third**

**Subject: Reliability**

**For the academic year 2022-2023**

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| First | 3(T) +1(D) | The reliability function, mean time to failure ,hazard function bathtubcurve | The related reliability functions | Blackboard | Daily, semester a final exams - Duties Student participati |
| Second | 3(T) +1(D) | The conditional reliability–design life and failure mode,their relationship of all these function and examples | The related reliability functions | Blackboard | Daily, semester and final exams - Duties Student participation |
| Third | 3(T) +1(D) | Constant failure rate–The exponential reliability function – Failure with CFR– Memorylessness– Failure modes– Failure modes with CFR | The exponential distribution and their related functions | Blackboard | Daily, semester and final exams - Duties Student participation |
| Fourth | 3(T) +1(D) | Failure on | Failure modes and exponential | Blackboard | Daily, semester and final exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Third**

**Subject: Reliability**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | demand– redundancy and CFR model – applications | distribution | | - Duties Student participation |
| **Fifth** | **3(T) +1(D)** | Time dependent failure models-The Weibull distribution-Design median and mode-Burn-in screening | Weibull distribution (Time dependent failure rate) | Blackboard | Daily, semester and final exams - Duties Student participation |
| **Sixth** | **3(T) +1(D)** | Semester exam | | Blackboard | Daily, semester and final exams - Duties Student participation |
| **seventh** | **3(T) +1(D)** | Failure modes-Identical Weibull process | Failure modes | Blackboard | Daily, semester and final exams - Duties Student participation |
| **Eghith** | **3(T) 1(D)** | Derive all the characteristic functions related to the reliability of time dependent models | The Weibull distribution (Time dependent failure rate) | Blackboard | Daily, semester and final exams - Duties Student participation |
| **nineth** | **3(T) +1(D)** | Redundancy with failure rate–and Application | Redundancy and Weibull distribution | Blackboard | Daily, semester and final exams - Duties Student participation |
| **Tenth** | **3(T) +1(D)** | Reliability system. Serial configuration., Parallel | Reliability system | Blackboard | Daily, semester and final exams - Duties Student participation |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Third**

**Subject: Reliability**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | configuration. | | | |
| **Eleventh** | **3(T) +1(D)** | Combined series–parallel systems–redundancy High levels verses low–level | Reliability system | Blackboard | Daily, semester and final exams - Duties Student participation |
| **Tweleveth** | **3(T) +1(D)** | System structure function ,minimal cut and minimal paths(optimal) | Reliability system | Blackboard | Daily, semester and final exams - Duties Student participation |
| **Thirteenth** | **3(T) +1(D)** | Complex systems | Reliability system | Blackboard | Daily, semester and final exams - Duties Student participation |
| **Fourteenth** | **3(T) +1(D)** | Compute the reliability of complex system | Reliability system | Blackboard | Daily, semester and final exams - Duties Student participation |

## 11. Course Evaluation

Semester Exam 40% ,Final Exam 60%

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | An introduction to reliability |
| Main references (sources) | Charles,E.E(1997),An introduction to reliabil Engineering |
| Recommended books and references (scientific | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Third**

**Subject: Reliability**

**For the academic year 2022-2023**

| | |
|---|---|
| journals, reports…) | |
| Electronic References, Websites | https:llcoeng.uobaghdad.edu.iq<br>https:coeng,uobaghdad.edu.iq |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :3rd**

**Subject: Data mining (1)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023
## Course Description Form

| |
|---|
| 1. Course Name: |
| **Data mining (1)** |
| 2. Course Code: |
| **CMSI23-F3231** |
| 3. Semester / Year: |
| **Course 2\ 2023–2024** |
| 4. Description Preparation Date: |
| **20\ 04\ 2023** |
| 5. Available Attendance Forms: |
| **Attendance+Examination** |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| **2 + 2 Practice** |
| 7. Course administrator's name (mention all, if more than one name) |

| | |
|---|---|
| Name: Ass. Prof. Dr. Osamah Basheer Shukur<br>Email: drosamahannon@uomosul.edu | Name: Lec. Dr. Nur Nawzat |

| |
|---|
| 8. Course Objectives |
| **Introduction to the basic concepts of data mining from a statistical perspective** |
| 9. Teaching and Learning Strategies |
| **Developing students on data mining, classification, and clustering by using statistical and machine learning methods** |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :3rd**

**Subject: Data mining (1)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| Week 1 | 2 | | Data Mining, definition, and introduction, | Blackboard and PowerPoint | Assignment |
| Week 2 | 2 | | Types of Data, Contingency Table | Blackboard and PowerPoint | |
| Week 3 | 2 | | Histogram, Scatter plot, and Box-plot., Quintiles and Probability Plot, | Blackboard and PowerPoint | |
| Week 4 | 2 | | Goodness of fits, Graph in Multivariate Variables, | Blackboard and PowerPoint | |
| Week 5 | 2 | | Data Transformations, | Blackboard and PowerPoint | |
| Week 6 | 2 | | Box-Cox Transformation, | Blackboard and PowerPoint | |
| Week 7 | 2 | | Measures of distance, Measures of Similarity | Blackboard and | Assignment |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :3rd**

**Subject: Data mining (1)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | | **PowerPoint** | |
| **Week 8** | 1st Mid-course Exam | | | | |
| **Week 9** | 2 | | **Clustering, definition and introduction,** | **Blackboard and PowerPoint** | Assignment |
| **Week 10** | 2 | | **Hierarchical methods for clustering,** | **Blackboard and PowerPoint** | |
| **Week 11** | 2 | | **Non- Hierarchical methods for clustering, R codes and their uses.** | **Blackboard and PowerPoint** | |
| **Week 12** | 2 | | **Time Series Analysis** | **Blackboard and PowerPoint** | |
| **Week 13** | 2nd Mid-course Exam | | | | |
| **Week 14** | 2 | | **Computer packages for statistical analysis** | | |
| **Week 15** | 2 | | **Real data and application** | | |
| 11.Course Evaluation | | | | | |
| **40 for mid-course exam, 60 for final exam** | | | | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Stage :3rd**

**Subject: Data mining (1)**

**Lecturer's name:**
Ass. Prof. Dr. Osamah Basheer Shukur
**Academic title:** Assistant Professor
**Academic qualification:** Doctorate
**Email:**
drosamahannon@uomosul.edu

**Lecturer's name:**
Lec. Dr. Nur Nawzat
**Academic title:** Lecturer
**Academic qualification:** Doctorate
**Email:**
nooalior@uomosul.edu.iq

## For the academic year 2022-2023

| 12. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports…) | **Giudici, P. (2005).** ***Applied data mining: statistical methods for business and industry*****. John Wiley & Sons.**<br>**Nisbet, R., Elder, J., & Miner, G. (2009).** ***Handbook of statistical analysis and data mining applications*****. Academic press.** |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: safwan75nathem@uomosul.edu.iq**

**Stage : Second**

**Subject: Probability and random variables**

# For the academic year 2022-2023
# Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Probability and random variables (1) / second stage | |
| 2. Course Code: | |
| CMSI23-F2111 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | • To develop the student's problem-solving skills by getting acquainted with sets theory and some of its basic theories and understanding its laws<br>• Developing the student's abilities on counting methods to reach sets theory as well as the binomial expansion law<br>• Developing skills in applying probability theory and understanding its axioms, its laws and application<br>• Identify the random experiment and the accidents that will appear in the experiment in order to obtain a sample space<br>• Learn about independent events and how to identify them, in addition to conditional probability and its connection to Bayes' theory<br>• Provide a solid foundation for advanced work on probability and its applications, and is essential to understanding many applied fields |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in introducing this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time by getting acquainted with the theory of probability and random variables, in the first part and expanding the student's mind. This will be achieved through classes and interactive educational programs to learn about sets theory and counting methods for it, and through learning about random experiment and sample space in forming sets, as well as using basic probabilistic laws in application in its various forms, which will be the basis for the student for his future stages. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: safwan75nathem@uomosul.edu.iq**

**Stage : Second**

**Subject: Probability and random variables**

## For the academic year 2022-2023

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Introduction of the Probability and Basic set theory. | Introduction of the Probability and Basic set theory. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 discussion | Basic Set theory, definitions of set theory. | Basic Set theory, definitions of set theory. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 discussion | Some Fundamental Theorems, Fundamental laws of set theory with theorems. | Some Fundamental Theorems, Fundamental laws of set theory with theorems. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 2 discussion | Sequence and limits, with theorems. | Sequence and limits, with theorems. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 discussion | Mid-term Exam + Field and σ-Field and Power of the set. | Mid-term Exam + Field and σ-Field and Power of the set. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 2 discussion | Techniques of Counting, Tree Diagrams and Arrangement | Techniques of Counting, Tree Diagrams and Arrangement | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 discussion | Techniques of Counting, Permutations. | Techniques of Counting, Permutations. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 discussion | Techniques of Counting, Combinations with theorems. | Techniques of Counting, Combinations with theorems. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 2 discussion | Combinations and Binomial theorem and Multinomial Expansion. | Combinations and Binomial theorem and Multinomial Expansion. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 2 discussion | Mid-term Exam + Probability | Mid-term Exam + Probability Introduction, | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: safwan75nathem@uomosul.edu.iq**

**Stage : Second**

**Subject: Probability and random variables**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | Introduction, Random Experiment, Events Kinds, Sample Space and Probability a law. | Random Experiment, Events Kinds, Sample Space and Probability a law. | | |
| **Week 11** | 2 theoretical + 2 discussion | Axiomatic Approach of Probability. | Axiomatic Approach of Probability. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 2 discussion | Probabilistic models according to the basic laws of set theory with theorems. | Probabilistic models according to the basic laws of set theory with theorems. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 discussion | Independent events, Conditional Probability. | Independent events, Conditional Probability. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Conditional Probability and Bayes law | Conditional Probability and Bayes law | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | Mid-term Exam + Bayes' theorem. | Mid-term Exam + Bayes' theorem. | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 10.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1-Introduction to probability theory ,Dr.dhafir H. Rasheed,1999,2-nd edition ,Baghdad university<br>2-probability , Dr.kubais S. A Fahady Dr. Pirlanty J. shamoon, Ministry of Highe Education and Scientific Research University of Mosul |
| Main references (sources) | 1- A first course in probability, Sheldon Ross, 2010, Eighth edition.<br>2- Probability, schume series |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | https://www.khanacademy.org/math/statistics-probability/random-variables-stats-library<br>https://www.khanacademy.org/math/statistics-probability<br>https://www.coursearena.io/topic/free-probability-theory-courses |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: safwan75nathem@uomosul.edu.iq**

**Stage : Second**

**Subject: Probability and random variables**

# For the academic year 2022-2023
# Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Probability and random variables (2) / second stage | |
| 2. Course Code: | |
| CMSI23-F2211 | |
| 3. Semester / Year: | |
| The second academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | • Developing the student's problem-solving skills by identifying random, intermittent and continuous variables based on group theory.<br>• Developing the student's abilities on counting methods to reach the probability mass function and study its properties, as well as the probability density function and study its properties.<br>• Developing skills in finding the distribution function for each of the probability mass function and the probability density function based on random variables and distinguishing between functions.<br>• Developing the student's role in benefiting from the generated functions and developing problem-solving skills through these functions.<br>• Identify some of the distributions commonly used in various fields of operation, including intermittent and continuous ones.<br>• To provide a solid foundation for advanced work on probabilities and their applications, essential to an understanding of many applied fields |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in the introduction of this unit is to encourage students to participate in the exercises, while improving and at the same time expanding their critical thinking skills through the theory of probability and discrete and continuous random variables obtained drawing on the theory of groups from the first part Expanding the mental and mental mind for students. This will be achieved through classes and interactive educational programs to identify the quality of random variables and their intermittent and continuous probabilistic functions as well as the distribution function and study the characteristics of cases, with identification of finding functions generated from mathematical expectation, variance and moments with the moment- |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: safwan75nathem@uomosul.edu.iq**

**Stage : Second**

**Subject: Probability and random variables**

## For the academic year 2022-2023

| | |
|---|---|
| | generating function, with identification of some common probability distributions discontinuous and continuous, as well as the use of basic probability laws in application in their various forms, which will be the basis for the student for his future stages. |

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Introduction in the Probabilities and The concept random variables. | Probabilities and random variables. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 discussion | Probability mass function, Discrete random variable. | Discrete random variable. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 discussion | Probability density function, Continuous random variable. | Continuous random variable. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 2 discussion | Distribution function, discrete and continuous variables. | Distribution function | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 discussion | Properties of mass and density functions for discrete and continuous variables. | Properties of mass and density functions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 2 discussion | Properties of distribution functions for discrete and continuous variables. | Properties of distribution functions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 discussion | Mid-term Exam + Laws and notes on finding the probability value of functions of discrete and continuous random variables. | Laws and notes on finding discrete and continuous random variables. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 discussion | Generating function, Mathematical Expectation and Variance with Properties. | Generating function, Mathematical Expectation | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 2 discussion | Mathematical Expectation and Variance of (p.m.f and p.d.f) for discrete and continuous variables. | Mathematical Expectation and Variance | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 2 discussion | Generating function, Moment, Central Moment and Non- | Generating function, | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: safwan75nathem@uomosul.edu.iq**

**Stage : Second**

**Subject: Probability and random variables**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | Central Moment. | | | |
| **Week 11** | 2 theoretical + 2 discussion | Moment Generating function and Characteristic function, discrete and continuous variables. | Moment Generating function | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 2 discussion | Mid-term Exam + Some discrete probability distributions. | Some discrete probability distributions. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 discussion | Finding the generating functions for the discrete distributions | Finding the generating functions for the discrete distributions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Some continuous probability distributions. | Some continuous probability distributions. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | Mid-term Exam + Finding the generating functions for the continuous distributions | the generating functions for the continuous distributions | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 10.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1-Introduction to probability theory ,Dr.dhafir H. Rasheed,1999,2-nd edition ,Baghdad university<br>2-probability , Dr.kubais S. A Fahady Dr. Pirlanty J. shamoon, Ministry of Higher Education and Scientific Research University of Mosul |
| Main references (sources) | 1- A first course in probability, Sheldon Ross, 2010, Eighth edition.<br>2- Probability, schume series |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | https://www.khanacademy.org/math/statistics-probability/random-variables-stats-library<br>https://www.khanacademy.org/math/statistics-probability<br>https://www.coursearena.io/topic/free-probability-theory-courses |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

# For the academic year 2022-2023
# Course Description Form

## 1. Course Name:

Sampling Theory I / second stage

## 2. Course Code:

CMSI22-F2121

## 3. Semester / Year:

The first academic course /2022-2023

## 4. Available Attendance Forms:

Classrooms in the Department of Statistics and Informatics

## 5. Number of Credit Hours (Total) / Number of Units (Total)

2 theoretical hours and 1 discussion hours/number of units: 2

## 6. Course Objectives

| | |
|---|---|
| **Course Objectives** | • **The student will acquire skills, methods, and modern techniques in dealing with different data and sampling methods according to the special cases of each study and choosing the best methods to reach the optimal results from the sample.** |

## 7. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | Work on explaining the methods of collecting samples<br>Reaching the correct and optimal estimation of statistical measurements<br>Disseminating the sample results to the community<br>Benefiting from the studied sample and applying it to future studies and research |

## 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 3 | Introduction to sampling, some statistical definitions, and basic concepts of | Definitions, terms, and laws of estimation. Definition of probability and its | Classroom + blackboard + data show | discussion |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | probability | limits | | |
| 2 | 3 | Simple random sampling and a method of estimating the arithmetic mean of the population with evidence and optimization | Point estimation, concept and application<br>Estimating the period of concept and implementation | Classroom + blackboard + data show | Discussion & HW |
| 3 | 3 | Simple random sampling and the method of estimating the total number of the population with evidence and examples | Explaining the estimation of the arithmetic mean with proofs. Explaining the estimation of the grand sum with proofs | Classroom + blackboard + data show | Discussion & HW |
| 4 | 3 | Proofs and examples | Explanation of the proof of Theorem 1 with result 1 with examples Explanation of the proof of Theorem 2 with result 2 with examples | Classroom + blackboard + data show | Homework |
| 5 | 3 | General exercises on simple random sampling | solving exercises | Classroom + blackboard + data show | Discussion |
| 6 | 3 | First exam | First exam | Classroom | exam |
| 7 | 3 | General exercises on simple random sampling | solving exercises | Classroom + blackboard + data show | Discussion |
| 8 | 3 | Evidence of lineage sampling | Proof of Theorem 3 / Proof of Theorem | Classroom + blackboard + | Discussion & HW |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | 4 | data show | |
| 9 | 3 | Preview the percentage of more than two characteristics | Proof of the theorem 5 applied examples | Classroom + blackboard + data show | Discussion & HW |
| 10 | 3 | Preview the percentage of more than two characteristics by excluding missing information | Proof of the theorem 6 applied examples | Classroom + blackboard + data show | Homework |
| 11 | 3 | Estimating the arithmetic mean and the total sum to examine the percentage of items that possess a certain characteristic | Proof of Theorem 7 Proof of Theorem 8 | Classroom + blackboard + data show | Homework |
| 12 | 3 | General exercises on the method of examining ratios | Solve a set of exercises | Classroom + blackboard + data show | Discussion |
| 13 | 3 | Estimating the variance to sample the ratio of two variables | Explanation of the proof of Theorem 9 applied example | Classroom + blackboard + data show | Discussion |
| 14 | 3 | Second exam | Second exam | Classroom | exam |
| 15 | 3 | General Review | Solve practical exercises | Classroom + blackboard + data show | Discussion |

## 9. Course Evaluation

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:**
rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023

| Endeavor score: 40. Exam score. Course: 60. Final score: 100 | |
|---|---|
| 10. Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | 1- العينات نظري وتطبيقي (أ.د. عبد المجيد حمزة الناصر أ.م صفاء يونس الصفاوي) |
| Main references (sources) | 1- Tillé, Yves. Sampling and estimation from finite populations. John Wiley & Sons, 2020.<br>2- Cochran, William G. *Sampling techniques*. John Wiley & Sons, 1977. |
| Recommended books and references (scientific journals, reports…) | 1- المعاينة الاحصائية جلال الدين الصياد مصطفى جلال مصطفى |
| Electronic References, Websites | https://www.tandfonline.com/doi/abs/10.1198/tas.2007.s89?journalCode=utas20<br>Sampling Methods: Exercises and Solutions |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: |
|---|
| Sampling Theory 2 / second stage |
| **2. Course Code:** |
| CMSI22-F2221 |
| **3. Semester / Year:** |
| The Second academic course /2022-2023 |
| **4. Available Attendance Forms:** |
| Classrooms in the Department of Statistics and Informatics |
| **5. Number of Credit Hours (Total) / Number of Units (Total)** |
| 2 theoretical hours and 1 discussion hours/number of units: 2 |
| **6. Course Objectives** |

| | |
|---|---|
| **Course Objectives** | • **The student will acquire skills, methods, and modern techniques in dealing with different data and sampling methods according to the special cases of each study and choosing the best methods to reach the optimal results from the sample.** |
| **7. Teaching and Learning Strategies** | |
| **Strategy** | Work on explaining the methods of collecting samples<br>Reaching the correct and optimal estimation of statistical measurements<br>Disseminating the sample results to the community<br>Benefiting from the studied sample and applying it to future studies and research |

**8. Course Structure**

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 3 | Stratified random sampling | Explaining the general concept, symbols, and ways to define them | Classroom + blackboard + data show | discussion |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | The mathematical aspect of stratified sampling | Explain the proofs of Theorems 1-2 and the proofs of their corresponding results | Classroom + blackboard + data show | discussion |
| 3 | 3 | Estimating sample size in stratified sampling | Explanation of theoretical methods | Classroom + blackboard + data show | discussion |
| 4 | 3 | Practical application | Explain applied examples from practical reality | Classroom + blackboard + data show | Homework |
| 5 | 3 | Theoretical comparison between simple random sampling and stratified sampling | Explaining the theoretical aspect with practical examples | Classroom + blackboard + data show | discussion |
| 6 | 3 | First exam | First exam | Classroom | exam |
| 7 | 3 | Stratified random sampling for percentages | Explaining the general concept with the mathematical and applied aspect | Classroom + blackboard + data show | discussion |
| 8 | 3 | Estimating the ratio between two variables in stratified sampling | General definitions of ratio with an explanation of the mathematical and applied aspects | Classroom + blackboard + data show | discussion |
| 9 | 3 | Estimation by regression method in stratified random sampling | The theoretical aspect of the concept of estimation using | Classroom + blackboard + data show | discussion |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | regression method | | |
| 10 | 3 | Estimation by regression method in stratified random sampling | The practical and applied aspect of estimation using the regression method | Classroom + blackboard + data show | Homework |
| 11 | 3 | Systematic Sampling | Explaining the mathematical method and the method, indicating the symbols used and the theoretical aspects | Classroom + blackboard + data show | Homework |
| 12 | 3 | Systematic Sampling | Practical procedure for inspection | Classroom + blackboard + data show | discussion |
| 13 | 3 | Comparison between sampling methods | Theoretical comparison between simple, stratified, and systematic random sampling methods, with an explanation of their applied method | Classroom + blackboard + data show | discussion |
| 14 | 3 | Second exam | Second exam | Classroom | exam |
| 15 | 3 | General Review | Solve practical exercises | Classroom + blackboard + data show | discussion |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr. Rikan A. Ahmed

**Academic title:** Assistant Professor

**Academic qualification: Ph.D.**

**Email:** rikan.ahmed@uomosul.edu.iq

**Stage : Second**

**Subject: Sampling Theory**

## For the academic year 2022-2023

| 10. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | 2- العينات نظري وتطبيقي (أ.د. عبد المجيد حمزة الناصر أ.م صفاء يونس الصفاوي) |
| Main references (sources) | 3- Tillé, Yves. Sampling and estimation from finite populations. John Wiley & Sons, 2020.<br>4- Cochran, William G. *Sampling techniques*. John Wiley & Sons, 1977. |
| Recommended books and references (scientific journals, reports…) | 2- المعاينة الاحصائية جلال الدين الصياد مصطفى جلال مصطفى |
| Electronic References, Websites | https://www.tandfonline.com/doi/abs/10.1198/tas.2007.s89?journalCode=utas20<br>Sampling Methods: Exercises and Solutions |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : second**

**Subject: Linear Albgebra**

# For the academic year 2022-2023
# Course Description Form

| 1. Course Name: | |
|---|---|
| Linear Algebra /second stage | |
| 2. Course Code: | |
| CMSI22-F2151 | |
| 3. Semester / Year: | |
| The FIRST academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 discussion hours/number of units: 6 | |
| 6. Course Objectives | |
| **Course Objectives** | 1- The student discusses vector spaces and related abstract concepts.<br>2- The student is familiar with the algebraic concepts and terminology of matrices and determinants and inverses, and uses creative thinking in the use of elementary transformation methods.<br>3-Learn about systems of linear equations and their applications.<br>4-Recognize the basis and dimension of vector spaces |
| 7. Teaching and Learning Strategies | |
| **Strategy** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students |
| 8. Course Structure | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : second**

**Subject: Linear Albgebra**

## For the academic year 2022-2023

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Definition of matrices and types | Definition of matrices | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 discussion | Algebraic processes on matrices.( addition ,subtraction, multiplication) | Algebraic processes on matrices | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 discussion | Determinants, Determinant solution methods | Determinants | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 2 discussion | properties of the determinant | properties of the determinant | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 discussion | Mid-term Exam + Inverse matrix using the matrices method (the adjoint of matrix) | Inverse matrix | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 2 discussion | Definition of matrices and types | Definition of matrices | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 discussion | Algebraic processes on matrices.( addition ,subtraction, multiplication) | Algebraic processes on matrices | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 discussion | Determinants, Determinant solution methods | Determinants | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : second**

**Subject: Linear Albgebra**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 9** | 2 theoretical + 2 discussion | properties of the determinant | properties of the determinant | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 2 discussion | rank of matrix, The canonical form | rank of matrix, The canonical form | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical + 2 discussion | equivalent matrices, Relationship of ranks and linear equations m>n | equivalent matrices, Relationship of ranks and linear equations | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 2 discussion | Mid-term Exam + Relationship of ranks and linear equations m=n | Relationship of ranks and linear equations | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 discussion | Latent roots of order (2x2), (3x3) | Latent roots | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Vector and Algebraic processes on vector, Euclidean length and Euclidean distance | Vector and Algebraic | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | Linear Composition | Linear Composition | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : second**

**Subject: Linear Albgebra**

## For the academic year 2022-2023

| 10. Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | Linear Algebra, Abdul Majeed Hamza and Lamia Baqir |
| Main references (sources) | 1- Linear Algebra, Abdul Majeed Hamza and Lamia Baqir<br>2- Elementary and Intermediacies Algebra (2)—Mark Dugopolski |
| Recommended books and references (scientific journals, reports…) | Various on the Internet |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Second**

**Subject: Differential Equations**

**For the academic year 2022-2023**

# Course Description Form

| |
|---|
| 1. Course Name: |
| Differential Equation/Second phase |
| 2. Course Code: |
| CMSI24-F2251 |
| 3. Semester / Year: |
| The second course/2023/2024 |
| 4. Description Preparation Date: |
| **17/2/2024** |
| 5. Available Attendance Forms: |
| *Classrooms of department statistics and informatics* |
| *6. Number of Credit Hours (Total) / Number of Units (Total)* |
| *(3) theoretical hours and (1) discussion hours/number of units: 3* |
| *7. Course administrator's name (mention all, if more than one name)* |
| *Name: Dr.Khalida Ahmed Mohammed* *Email: khalida@uomosul.edu.iq* |
| *8. Course Objectives* |

| | |
|---|---|
| ***Course Objectives*** | • *1. Definition of the differential equation the most important special elements.*<br>• *2. Identify the most important types differential equations and how to find gen and specific solutions to them.* |
| *9. Teaching and Learning Strategies* | |
| ***Strategy*** | *The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical* |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Second**

**Subject: Differential Equations**

**For the academic year 2022-2023**

| | |
|---|---|
| | *thinking skills. This will be achieved through classes, interactive tutorials by taking time series of a specific phenomenon and analyzing it using the Minitab program and predicting its future values.* |

*10. Course Structure*

| ***Week*** | ***Hours*** | ***Required Learning Outcomes*** | ***Unit or subject name*** | **Learning method** | **Evaluation method** |
|---|---|---|---|---|---|
| ***First*** | ***3(T) +1(D)*** | *Identifying differential equations, concepts and terminology, and extracting differential equations from the general solution* | *Introduction to differential equations* | Blackboard | Daily, semester a final exams - Duties Student participati |
| ***Second*** | ***3(T) +1(D)*** | *Finding the solution to first-order and first-order equations by separating the variables, finding the solution to linear equations, and finding the conversion of equations to linear equations.* | *Solving equations of first order and first degree* | Blackboard | Daily, semester a final exams - Duties Student participati |
| ***Third*** | ***3(T) +1(D)*** | *Homogeneous differential equations and perfect differential equations* | *Finding general and specific solutions* | Blackboard | Daily, semester a final exams - Duties Student participati |
| ***Fourth*** | ***3(T) +1(D)*** | *transforming incomplete differential equations to complete equations using integration factors* | *Solve examples of this type* | Blackboard | Daily, semester a final exams - Duties Student participati |
| ***Fifth*** | ***3(T) +1(D)*** | *Differential* | *How to reduce the* | Blackboard | Daily, semester a |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Second**

**Subject: Differential Equations**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | *equations of higher order and first order, reducing the higher order and then solving the equation* | *rank of the equation and find the solution using direct integration* | | final exams<br>- Duties<br>Student participati |
| ***Sixth*** | ***3(T) +1(D)*** | *Differential equations in which the independent variable does not appear* | *Higher order and first order equations* | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |
| ***seventh*** | ***3(T) +1(D)*** | *Differential equations in which the dependent variable does not appear* | *Higher order and first order equations* | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |
| ***Eghith*** | ***3(T) 1(D)*** | | *Semester exam* | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |
| **nineth** | **3(T) +1(D)** | Linear differential equations with fixed coefficients and order n and finding their general solution | Differential equations with constant coefficients | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |
| **Tenth** | **3(T) +1(D)** | Euler's equation and finding its solution | Euler's equation | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |
| **Eleventh** | **3(T) +1(D)** | Finding the general and specific solution for differential equations with fixed coefficients | Higher degree differential equations with examples | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |
| **Tweleveth** | **3(T) +1(D)** | Differential equations that can be solved with respect to the independent | Higher degree equations | Blackboard | Daily, semester a final exams<br>- Duties<br>Student participati |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Khalida Ahmed Mohammed**

**Academic title: Lecture**

**Academic qualification: Ph.D**

**Email: khalida@uomosul.edu**

**Stage : Second**

**Subject: Differential Equations**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| | | variable | | | |
| **Thirteenth** | **3(T) +1(D)** | Differential equations that can be solved with respect to the dependent variable | Higher degree equations | Blackboard | Daily, semester a final exams - Duties Student participati |

## 11. Course Evaluation

Semester Exam 40% ,Final Exam 60%

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Methods for solving differential equation written by Khaled Al-Samarrai |
| Main references (sources) | Engineering Mathematics / Written by Kha Abdel Hamid Al-Nouri |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | 1 https://www.du.edu.eg<br>2 https://uomustansiriyah.edu.iq |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Time series analysis**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: | |
|---|---|
| Time series analysis | |
| 2. Course Code: | |
| CMSI23-F2141 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | • The most important time series are those related to economic indicators, annual sales of companies in all aspects of their activity, education, population size, etc. The change that occurs in the values of the time series variable or the values of its variables is a time function that can be represented graphically.<br>• Using time series data to anticipate and predict future change through yesterday's and today's facts.<br>• Using time series in control systems through which the production process is controlled and whether the product conforms to the required specifications or not. Then the correct decision can be made and errors in the production process can be corrected.<br>• Building software systems for electronic control of production processes and their specifications |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in delivering this unit is to encourage students' participation in the exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through interactive classes and tutorials by taking time series of a given phenomenon, analyzing them using Minitab and predicting their future values. |
| 8. Course Structure | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Time series analysis**

## For the academic year 2022-2023

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Definition of time series and its applications and definition of the main components of time series | Introduction to Time Series | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 discussion | (Hand smoothing method and the method of the two-half-series averages) | Methods of determining linear trend | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 discussion | (Moving averages method) | Methods of determining linear trend | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 2 discussion | (Least squares method) | Methods of determining linear trend | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 discussion | Mid-term exam | | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 2 discussion | (Second and third degree curves method) | Methods of determining nonlinear trend | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 discussion | (Semi-logarithmic equation method) | Methods of determining nonlinear trend | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 discussion | Two methods to eliminate the effect (multiplication model - addition model) | Excluding the effect of trend | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 2 discussion | Measuring seasonal changes using the simple ratios method and eliminating its effect | Seasonal variations | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Time series analysis**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 10** | 2 theoretical + 2 discussion | Mid-term exam | | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical + 2 discussion | Measuring seasonal changes using the ratio to the general average method and eliminating its effect | Seasonal variations | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 2 discussion | Measuring seasonal changes using the ratio to the general trend method and eliminating its effect | Seasonal variations | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 discussion | Method of measuring cyclical changes and eliminating their effect | Cyclical variations | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Method of measuring random changes and eliminating their effect | Random variations | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | Midterm exam | | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1- al-Mashhadani, M. H. & Eifan M.M." From the methods of statistics (indices and time series)"<br>2- Box, G., Jenkins, G., Reinsel ,G. and Ljung G.," Time Series Analysis Forecasting and control", Copyright Year: 2016. |
| Main references (sources) | 1- Liu, L.,"Time Series Analysis and Forecasting ", Copyright Year: 2006.<br>2- Wei , W.S. " Time Series Analysis : Univariate and Multivariate Methods ", Copyright Year: 1990 |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Time series analysis**

## For the academic year 2022-2023

| | |
|---|---|
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email:** najlaa.s.a@uomosul.edu.iq

**Stage : Second**

**Subject: Databases**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: | | | | | |
|---|---|---|---|---|---|
| **Databases** | | | | | |
| 2. Course Code: | | | | | |
| CMSI23-F2241 | | | | | |
| 3. Semester / Year: | | | | | |
| The second academic course | | | | | |
| 4. Available Attendance Forms: | | | | | |
| Classrooms in the Department of Statistics and Informatics | | | | | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 2 theoretical hours and 2 discussion hours/number of units: 3 | | | | | |
| 6. Course Objectives | | | | | |
| **Course Objectives** | • Ability to interact with future systems. One of the most important goals of database design is to plan the database so that it allows modifications and improvements to it without the need to modify application programs or reorganize files.<br>• • Design data so that it is free of duplication and can be retrieved, modified and added to without the problems that can occur with the presence of duplication in it.<br>• • Reduce the total cost of storage requirements.<br>• • Physical and logical organization of data so that it can meet expected queries at the appropriate speed, as well as unplanned queries or produce non-routine reports | | | | |
| 7. Teaching and Learning Strategies | | | | | |
| **Strategy** | The main strategy that will be adopted in delivering this unit is to encourage students' participation in exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through classrooms, computer labs, assignments, tests and projects. | | | | |
| 8. Course Structure | | | | | |
| **Week** | **Hours** | **Required Learning Outcomes** | **Unit or subject name** | **Learning method** | **Evaluation method** |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Databases**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Introduction and important concepts in database. Database properties. Definition of Access 2010. Features of Access 2010 | Introduction to Databases | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 discussion | Components of Access 2010 interface | Getting to Know the Access 2010 Interface | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 discussion | Creating a database. Designing tables | Creating a Database | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 2 discussion | Types of fields available when creating tables. | Fields in Access | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 discussion | Midterm exam | | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 2 discussion | Learn about field properties | Field Properties in Access | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 discussion | Adding a new field. Moving to a record using the mouse | Operations Performed on Fields | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 discussion | Previewing specific records using the filter. Changing the order of records in tables. Determining a primary key | Operations Performed on Records | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 2 discussion | Relationships between tables (linking tables). Conditions for creating relationships. Steps for creating relationships between tables. Types of table linking relationships. Displaying | Relationships in Databases | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Databases**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | table relationships. Deleting the relationship between tables. Relationship errors | | | |
| **Week 10** | 2 theoretical + 2 discussion | Midterm exam | | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical + 2 discussion | Defining queries. Methods of estimating queries: First: Query Wizard | Queries | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 2 discussion | Methods of estimating queries: Second: Query design | Designing Queries | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 discussion | Defining forms. And methods of creating forms | Forms | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Defining the report. Methods of creating reports. Previewing reports and printing reports | Reports | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | Midterm exam | | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 50. Exam score. Course: 50. Final score: 100

## 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1- Adrien W. and Nelson E. “Database Design” by Hsoub Academy, v1.0, first edition.<br>2- Aswad, Firas Muhammad and Lazim, Ali al-Hur “Databases” |
| Main references (sources) | Abou Elela ,M. 'Microsoft Office 2010 Professional" , |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Najlaa S. I.**

**Academic title: Assistant Professor**

**Academic qualification: Ph.D.**

**Email: najlaa.s.a@uomosul.edu.iq**

**Stage : Second**

**Subject: Databases**

## For the academic year 2022-2023

| | |
|---|---|
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Second**

**Subject:** Scientific research method

## For the academic year 2022-2023
# Course Description Form

| |
|---|
| 1. Course Name: |
| Scientific research method |
| 2. Course Code: |
| **CMSI23-F2261** |
| 3. Semester / Year: |
| Second course / 2022−2023 |
| 4. Available Attendance Forms: |
| My attendance |
| 5. Number of Credit Hours (Total) / Number of Units (Total) |
| 2 hours/2 units |
| 6. Course administrator's name (mention all, if more than one name) |
| Name: Mahmoud Mohammed Taher Jader Al-Abadi<br>Email: Mahmood81_tahr@uomosul.edu.iq |
| 7. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • Introducing students to the modern scientif method and the beginning of scientific the<br>• .Learn about the general concepts of the scientific method and the assumptions of t scientific method.<br>• .Explaining the concept of scientific resear its types, objectives and characteristics<br>• Access to the scientific research curriculur<br>• Knowledge of the characteristics of a successful researcher, data collection tools and methods for selecting a study sample.<br>• Knowing the steps for conducting scientifi research and how to write it.<br>• Learn about ways to document various sources and references.<br>• Introducing the student to the methods of scientific research, the elements of the research plan, and the characteristics of scientific thinking, and enabling him to wr |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Second**

**Subject:** Scientific research method

## For the academic year 2022-2023

| | |
|---|---|
| | scientific research that is consistent with th correct method of scientific research. |

## 8. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | 1. The student should be able to explain the characteristics of scientific research and its importance.<br>2. The student should be able to describe the methods and basics of scientific research<br>3. The student should link research methods and the appropriate tools for them.<br>4. The student must adhere to the ethics and morals of scientific research.<br>5. Students acquire skills in constructing scientific research using scientific research tools.<br>6. Enabling the student to diagnose problems and reach a solution according to the scientific method.<br>7. Enabling the student to read correctly and carefully and choose the appropriate information solve problems.<br>8. Being able to prepare a scientific research plan according to the correct scientific foundatio<br>9. Enabling the student to write scientific research according to the correct scientific foundations. |

## 9. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| First | 2 | The modern scientific method, science and knowledge, the beginning of scientific theor building scientific theory, the functions of scientific theory and its steps | The modern scientific method | writing board Data show | |
| Second | 2 | Scientific laws, conditions for scientific laws steps of the scientific method, risks facing scientific research | Scientific laws | writing board Data show | Homework |
| Third | 2 | General concepts of the scientific method, assumptions of the scientific method for natu phenomena, goals of science, thought and thinking methods | General concepts of the scientific method | writing board Data show | Homework |
| Fourth | 2 | Introduction, the concept of scientific resear types of scientific research | Introduction, the concep scientific research | writing board Data show | Homework |
| Fifth | 2 | Objectives of scientific research, characteris of scientific research, steps for preparing scientific research | Objectives and characteristics of scientific research | writing board Data show | Homework |
| Sixth | 2 | Scientific research methods, historical metho survey method, case study method, experimental method, statistical method, content analysis method | Modern scientific metho | writing board Data show | Daily exam |
| Seventh | 2 | Characteristics of a successful researcher, ty of research, tools for collecting data in scien research, questionnaire | Characteristics of a successful researcher | writing board Data show | Homework |
| Eighth | 2 | Semester exam | Semester exam | Semester exam | Semester exa |
| Ninth | 2 | Types of questionnaire in scientific research, observation method, interview method, testi | Types of questionnaires scientific research | writing board Data show | Homework |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Second**

**Subject:** Scientific research method

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| Tenth | 2 | Sample selection methods in scientific resea steps for selecting a research sample | the sample | writing board Data show | Homework |
| Eleventh | 2 | Types of samples, probability sample, non-probability sample | Types of samples, probability sample | writing board Data show | Homework |
| Twelveth | 2 | Collecting and analyzing information, readir conditions for reading in research | Collect and analyze information | writing board Data show | Homework |
| Twelfth | 2 | Methods of documenting scientific research sources and references, the importance of documentation, types of documentation, the most important methods of documenting sources and references | Methods of documenting scientific research sourc and references | writing board Data show | Homework |
| Thirteenth | 2 | The difference between sources and referenc types of references, the importance of source and references in scientific research, a list of sources and references for scientific research other controls for writing a list of sources an references for scientific research. | Methods of documenting scientific research sourc and references: | writing board Data show | Daily exam |
| Fourteenth | 2 | Documentation methods that can be relied u by the scientific researcher: Harvard method MAL method, PAP method | Documentation methods that can be relied upon b the scientific researcher | writing board Data show | Homework |

## 10. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

## 11. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | هيم، مروان عبد المجيد. (2000). أسس البحث العلمي لإعداد الرسائل الجامعية. مؤسسة الوراق. |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.: Mahmoud Mohammed Taher Jader**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: Mahmood81_tahr@uomosul.edu.iq**

**Stage : Second**

**Subject:** Scientific research method

## For the academic year 2022-2023

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Noorsal.A.Z.**
**Academic title: Teacher**
**Academic qualification: Ph.D.**
**Email: zeennorsal@uomosul.edu.iq**

**Stage : Second**
**Subject** Numerical Analysis

## For the academic year 2022-2023
# Course Description Form

| |
|---|
| 1. Course Name: : |
| Numerical Analysis I |
| 2. Course Code: |
| CMS123-F2131 |
| 3. Semester / first |
| Semester 1 |
| 4. Description Preparation Date: |
| |
| 5. Available Attendance Forms |
| : Classrooms within the department,classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 2 Theoretical 2 Practical Number of units 3 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: D. Norsal Ahmed Zeen Alabiden<br>Email: zeennorsal@uomosul.edu.iq<br>Nada Nazar Mohammed nada-nazar1984@uomosul.edu.iq<br>Israa abduljwaad saleh israa .alameen81@uomosul.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **1-The student should be familiar with the numeric methods used Statistics to solve mathematical problems that arise in various fields.**<br>**2-Discuss basic numerical techniques, algorith and their applications, in solving linear nonlinear equations**<br>**3-Identify interpolation and integration methods for a function.** |

| |
|---|
| 9. Teaching and Learning Strategies |

| | |
|---|---|
| **Strategy** | |

| | |
|---|---|
| | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, computer labs, assignments , quizzes, and projects. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 4 | Understand the basic concepts and principles of numerical methods. Recognizing sources of errors in numerical. | **Sources** of errors in numerical computations | Blackboard | |
| **Week 2** | 4 | Roots of nonlinear equations | Roots of nonlinear equations –Root locating using graphs | Blackboard | |
| **Week 3** | 4 | intermediate value theorem | Roots of nonlinear equations – Root locating using the intermediate value theorem | Blackboard | Quizze |
| **Week 4** | 4 | Bisection Algorithm | Solving nonlinear equations – Bisection Algorithm | Blackboard | |
| **Week 5** | 4 | Secant Algorithm. | | Blackboard | |
| **Week 6** | 4 | Newton-Raphson's Algorithm. | Solving nonlinear equations – Secant Algorithm | Blackboard | |
| **Week 7** | 4 | Nonlinear equations -Newton-Raphson's Algorithm | Solving-nonlinear equations-Newton-Raphson's Algorithm. | Blackboard | |
| **Week 8** | 4 | Gaussian elimination Method. | Newton-Raphson's Algorithm Solving a system of nonlinear equations – Multidimensional Newton-Raphson's Algorithm. Solving a system of linear equations– Review | Blackboard | Mid-term exam |

| | | | | | |
|---|---|---|---|---|---|
| **Week 9** | 4 | Gauss-Jordan method | of direct method Gaussian elimination. | Blackboard | |
| **Week 10** | 4 | linear equations– Review of direct method -inverse matrix | Solving a system of linear equations– Review of direct method Gauss-Jordan | Blackboard | |
| **Week 11** | 4 | Triangular factorization method. | Solving a system of linear equations– Review of direct method -inverse matrix | Blackboard | |
| **Week 12** | 4 | Jacobi iterative method | Solving a system of linear equations– Review of direct method , Triangular factorization | Blackboard | Quizze |
| **Week 13** | 4 | Gauss-Seidel iterative method. | Solving a system of linear equations Jacobi iterative method | Blackboard | |
| **Week 14** | | | | | |
| **Week 15** | 4 | Interpolation. | Solving a system of linear equations– Gauss -Seidel iterative Method. | Blackboard | |
| | 4 | Quadratic interpolation. | Interpolation-The direct approach. | Blackboard | |
| | | **the final Exam** | The direct approach Quadratic interpolation | | |
| | | | **the final Exam** | | |

| 11.Course Evaluation | |
|---|---|
| Pursuit score of 40: Exam score of 60: Final score of 100 | |
| 12.Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | |

| | |
|---|---|
| Main references (sources) | Conte, Samuel Daniel, and Carl De Boor. Elemen numerical analysis: an algorithmic approach. Society for Industrial and Applied Mathematics, 2017. Stoyan, Gisbert, and Agnes Baran. Elementary numerical mathematics for programmers and engineers. Basel, Switzerland: Springer International Publishing, 2016 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Numerical Analysis II | |
| 2. Course Code: | |
| CMS123-F2231 | |
| 3. Semester / Year: | |
| Second Semester | |
| 4. Description Preparation Date: | |
| | |
| 5. Available Attendance Forms: | |
| Classrooms within the department,classroom | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 Theoretical 2 Practical Number of units 3 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: D.Norsal Ahmed Zeen Alabiden<br>Email: zeennorsal@uomosul.edu.iq<br>Nada Nazar Mohammed nada-nazar1984@uomosul.edu.iq<br>Israa abduljwaad saleh israa.alameen81@uomosul.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **1- Introduce the student to the basic concepts of numerical methods used in statistics to solve mathematical problems that arise in various fields. And it's a continuation of numerical analysis I.<br>2- The student should be familiar with numerical differentiation and numerical integration.<br>3- The student discusses the initial value problems of ordinary differential equations and the numerical solution of differential equations** |
| 9. Teaching and Learning Strategies | |

| | |
|---|---|
| **Strategy** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, computer labs, weekly assignments, quizzes, and projects. |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| Week1 | 4 | Interpolation | Interpolation ( Linear , quadratic,nth) | Blackboard | |
| Week2 | 4 | Newton for dividing differences method . | Linear interpolation Using polynomial – Newton for dividing differences . | Blackboard | |
| Week3 | 4 | quadratic Interpolation using Newton's method | quadratic Interpolation – using Newton's polynomial of dividing differences | Blackboard | |
| Week4 | 4 | nth -interpolation using Newton's method | interpolation of nth – using Newton's polynomial of dividing differences | Blackboard | |
| Week 5 | 4 | LaGrange method | Numerical differentiation of interpolants – Application on LaGrange interpolants | Blackboard | **Quizzes** |
| Week6 | 4 | Numerical differentiation of functions | Numerical differentiation of functions using Forward, Backward, and Central divided differences approaches | Blackboard | |
| Week7 | 4 | Comparing accuracy of numerical differentiation approaches | Tylor's Expansion, Comparing accuracy of numerical differentiation approaches. | Blackboard | |
| Week8 | 4 | numerical differentiation | | Blackboard | |
| Week 9 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 4 | numerical differentiation | High-order numerical differentiation | | |
| Week 10 | 4 | Perform numerical integration of functions. | Analysis of errors in derivation Numerical | Blackboard<br>Blackboard | **Mid-term exam** |
| Week 11 | 4 | Simpson's rule | Numerical integration - Trapezoidal rule. | Blackboard | |
| Week 12 | 4 | Romberg integration | Numerical integration - Simpson's rule. | Blackboard | |
| Week 13 | 4 | Gaussian integration | Numerical integration - Romberg integration. | Blackboard | |
| Week 14 | 4 | double integral. | Numerical integration – Gaussian integration. | Blackboard | **Quizzes** |
| Week 15 | 4 | Newton-Cotes | Numerical double integral. | Blackboard | |
| Week 16 | | **the final Exam** | - Newton-Cotes Quadrature Formula<br>**the final Exam** | Blackboard | |

## 11.Course Evaluation

Pursuit score of 40: Exam score of 60: Final score of 100

## 12.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | Stoyan, Gisbert, and Agnes Baran. Elementary numerical mathematics for programmers and engineers. Basel, Switzerland: Springer International Publishing, 2016<br>Conte, Samuel Daniel, and Carl De Boor. Elementary numerical analysis: an algorithmic approach. Society for Industrial and Applied Mathematics, 2017. |

| | |
|---|---|
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Mohammed Qasim Alawjar**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email:** mqy.alawjar@uomosul.edu.iq

**Stage : Second**

**Subject: Teaching methods**

# Course Description Form

| 1. Course Name: | |
|---|---|
| **Teaching methods** / second stage | |
| 2. Course Code: | |
| **CMSI24-F2171** | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours /number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | • Introducing the student to the characteristics, qualities and duties of a successful teacher and the objectives of teaching various sciences. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in presenting this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time by learning about teaching methods, and expanding the student's mind. This is done through interactive educational classes and programs to learn about the types of teaching methods. |

8. Course Structure

| Week | Hours | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|
| **Week 1** | 2 theoretical | Science and Thinking | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Mohammed Qasim Alawjar**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email:** mqy.alawjar@uomosul.edu.iq

**Stage : Second**

**Subject: Teaching methods**

| | | | | |
|---|---|---|---|---|
| **Week 2** | 2 theoretical | Inductive Thinking and Measurement | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical | Levels of Knowledge | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical | Facts | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical | Concepts and Perceptions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical | The Process of Forming Perceptions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical | How to Help the Student Form Perceptions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical | Types of Perceptions (Principles, Theories, Ideas) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical | General Ideas and Objectives in Teaching Science | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical | Behavioral or functional symptoms | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical | The position of psychologists and educators on behavioral symptoms | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical | Teaching science in light of Bloom's taxonomy | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical | Methods of teaching science | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical | Test and discussion | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Mohammed Qasim Alawjar**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email:** mqy.alawjar@uomosul.edu.iq

**Stage : Second**

**Subject: Teaching methods**

| | | | | |
|---|---|---|---|---|
| | | | | |

| 9. Course Evaluation | |
|---|---|
| Endeavor score: 40. Exam score. Course: 60. Final score: 100 | |
| **10. Learning and Teaching Resources** | |
| Required textbooks (curricular books, if any) | |
| Main references (sources) | A collection of selected lectures from books on teaching methods and educational psychology |
| Recommended books and references (scientific journals, reports…) | Various sources on the Internet |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: | |
|---|---|
| Calculus (1) / First stage | |
| 2. Course Code: | |
| CMSI23-F1121 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 3 theoretical hours and 1 discussion hours/number of units: 6 | |
| 6. Course Objectives | |
| **Course Objectives** | • * The aim of this material is to help the student understand the subject of calculus.<br>• * Prove its fundamental role in various scientific fields, especially in statistics.><br>• • Throughout the course, you will explore the two key concepts.<br>• * Calculus: derivative and integral .<br>• * Both have many practical applications. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in the presentation of this module is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time by working on the preparation of prior knowledge, each topic begins with an explanation with examples and applications to demonstrate relevance and practical application in calculus to encourage students to explore how calculus is applied in various fields, such as statistics and computer science. Provide timely feedback on the student's work to identify errors, address them and strengthen learning through tests. Promote collaborative learning by assigning problem-solving tasks. Encourage students to work together, explain concepts to their peers, and engage in collaborative problem solving., In the first part and expand the student's mind. This is done through interactive educational classes and programs to learn about the basics of |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

| | |
|---|---|
| | calculus and expand the student's mind in the application in its various forms, which will be the basis for the student in his future stages. |

## 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 3 theoretical + 1 discussion | A Preview of Calculus - Reviewing Graphs and Types of Function | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 3 theoretical + 1 discussion | Review-Functions and Trigonometry | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 3 theoretical + 1 discussion | Limits and continuity of functions | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 3 theoretical + 1 discussion | Concept of Derivatives and the fundamental rules of Differentiation | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 3 theoretical + 1 discussion | Product, Quotient, and Chain Rules | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 3 theoretical + 1 discussion | Extrema on an Interval, Increasing and Decreasing Functions | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 3 theoretical + 1 discussion | Concavity and Points of Inflection | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 3 theoretical | Midterm Exam + Curve Sketching and Linear Approximations | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | 3 theoretical + 1 discussion | Applications-Optimization Problems | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 3 theoretical + 1 discussion | Antiderivatives and Basic Integration Rules | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 3 theoretical + 1 discussion | The Fundamental Theorem of Calculus | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 3 theoretical + 1 discussion | Basic Rules and Techniques of Integration | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 3 theoretical + 1 discussion | Differentiation and Integration of Exponential and Natural Logarithmic Functions | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 3 theoretical + 1 discussion | The area under the region .and between two curves | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 3 theoretical + 1 discussion | Preparatory week before the final Exam | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| 9. Course Evaluation | | | | | |
| Endeavor score: 40. Exam score. Course: 60. Final score: 100 | | | | | |
| 10. Learning and Teaching Resources | | | | | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

| | |
|---|---|
| Required textbooks (curricular books, if any) | The calculus of D. Ali Aziz Ali |
| Main references (sources) | The Great Courses Study Workbook for Understanding Calculus Problems, Solutions, and Tips by Bruce H. Edwards, PhD Professor of Mathematics, University of Florida, 2010. |
| Recommended books and references (scientific journals, reports…) | Online variety |
| Electronic References, Websites | https://ocw.mit.edu/ans7870/resources/Strang/Edited/Calculus/Calculus.pdf https://www.sciencedirect.com/topics/mathematics/calculus |

## Course Description Form

| |
|---|
| 1. Course Name: |
| Calculus (2) / First stage |
| 2. Course Code: |
| CMSI23-F1121 |
| 3. Semester / Year: |
| The second academic course |
| 4. Available Attendance Forms: |
| Classrooms in the Department of Statistics and Informatics |
| 5. Number of Credit Hours (Total) / Number of Units (Total) |
| 3 theoretical hours and 1 discussion hours/number of units: 6 |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

### 6. Course Objectives

| | |
|---|---|
| **Course Objectives** | • The aim of this material is to help the student understand the subject of calculus.<br>• Prove its fundamental role in various scientific fields, especially in statistics.><br>• Throughout the course, you will explore the two key concepts.<br>• Calculus: derivative and integral .<br>• Both have many practical applications. |

### 7. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | The main strategy that will be adopted in the presentation of this module is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time by working on the preparation of prior knowledge, each topic begins with an explanation with examples and applications to demonstrate relevance and practical application in calculus to encourage students to explore how calculus is applied in various fields, such as statistics and computer science. Provide timely feedback on the student's work to identify errors, address them and strengthen learning through tests. Promote collaborative learning by assigning problem-solving tasks. Encourage students to work together, explain concepts to their peers, and engage in collaborative problem solving., In the first part and expand the student's mind. This is done through interactive educational classes and programs to learn about the basics of calculus and expand the student's mind in the application in its various forms, which will be the basis for the student in his future stages. |

### 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 3 theoretical + 1 discussion | Basic Functions of Calculus and Limits | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 3 theoretical + 1 discussion | Trigonometric Integrals | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 3 theoretical | ,Integration by Parts | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | + 1 discussion | | | | |
| **Week 4** | 3 theoretical + 1 discussion | Integration by Trigonometric Substitution | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 3 theoretical + 1 discussion | Integration by Partial Fractions | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 3 theoretical + 1 discussion | applications of Integration methods | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 3 theoretical + 1 discussion | Midterm Exam + Improper Integrals | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 3 theoretical + 1 discussion | Moments, Centers of Mass, and Centroids | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 3 theoretical + 1 discussion | Sequences and Limits | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 3 theoretical + 1 discussion | Infinite Series— Geometric Series | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 3 theoretical + 1 discussion | , Divergence, Series | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 3 theoretical | Taylor Polynomials and Approximations | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | + 1 discussion | | | | |
| **Week 13** | 3 theoretical + 1 discussion | Power Series and Intervals of Convergence | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 3 theoretical + 1 discussion | Vectors in the Plane | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 3 theoretical + 1 discussion | Preparatory week before the final Exam | Definitions and Application | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

## 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | The calculus of D. Ali Aziz Ali |
| Main references (sources) | The Great Courses Study Workbook for Understanding Calculus Problems, Solutions, and Tips by Bruce H. Edwards, PhD Professor of Mathematics, University of Florida, 2010. |
| Recommended books and references (scientific journals, reports...) | Online variety |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Heyam A.A.Hayawi**

**Academic title: Assit Prof.**

**Academic qualification: Ph.D.**

**Email: he.hayawi@uomosul.edu.iq**

**Stage : First**

**Subject: Calculus**

## For the academic year 2022-2023

| | |
|---|---|
| Electronic References, Websites | https://ocw.mit.edu/ans7870/resources/Strang/Edited/Calculus/Calculus.pdf<br>https://www.sciencedirect.com/topics/mathematics/calculus |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : First**

**Subject: Linear Albgebra + MATLAB programming**

## For the academic year 2022-2023
## Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| MATLAB programming / first stage | |
| 2. Course Code: | |
| STAT110 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics + laboratory | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 laboratory hours/number of units: 5 | |
| 6. Course Objectives | |
| **Course Objectives** | • 1- Perform complex calculations very quickly<br>• 2- Derivation of logarithms<br>• 3- Simulation and design of various systems in all branches of science and industry<br>• 4- Data analysis and exploration<br>• 5- Drawing in two and three dimensions (2D-3D)<br>• 6-solve problems that are difficult for the researcher to do in the usual ways |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in providing solutions to some of the problems that the student faces in solving them when they cannot be solved by classical methods, by programming these solutions to reach the best solution depending on the programming language, including the MATLAB language that is commonly used in scientific departments, including statistics, and in the applied fields of the market Work as well as gain skills in developing solutions by encouraging students to participate in exercises, while improving and expanding critical thinking skills at the same time. This will be achieved through classes and interactive educational programs by identifying the directives of the MATLAB language program and getting to know the system of |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : First**

**Subject: Linear Albgebra + MATLAB programming**

## For the academic year 2022-2023

| | |
|---|---|
| | the system so that the student acquires the skill in programming to benefit from in the field of his studies, primary and higher |

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 laboratory | Introduction to the MATLAB program and the Windows program, clarification of some important instructions and commands, and writing data in the program+Application examples | Introduction to the MATLAB program | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 laboratory | Matrices in the MATLAB program, and methods of writing the matrix in the program.+ Application examples | Matrices in the MATLAB program | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 laboratory | Some instructions used in the matrix+Application examples | Some instructions used in the matrix | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 2 laboratory | Creates a row, column, or matrix vector with consecutive elements, and Create matrices based on instructions+Application examples | Creates a row, column, or matrix vector with consecutive elements, and Create matrices based on instructions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 laboratory | Mid-term Exam + Some other instructions for creating | Some other instructions for | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : First**

**Subject: Linear Albgebra + MATLAB programming**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | matrices+Application examples | creating matrices | | |
| **Week 6** | 2 theoretical + 2 laboratory | Finding the inverse, determinant, and rank of a matrix in MATLAB , and reshaping matrices+Application examples | Finding the inverse, determinant, and rank of a matrix in MATLAB , and reshaping matrices | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 laboratory | Adding new elements to the matrix, deleting some elements of the matrix, and changing the values of some elements of the matrix and submatrix+Application examples | Adding new elements to the matrix, deleting some elements of the matrix | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 laboratory | Algebraic operations on matrices in the MATLAB program, raising the matrix, finding the square root of the matrix and also logical signs in the MATLAB program+Application examples | Algebraic operations on matrices in the MATLAB program | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 2 laboratory | Using (and), (or) between matrices whose elements are (1,0), and how to write input and output sentences+Application examples | Using (and), (or) between matrices | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 2 laboratory | loops, and how to write a simple program | loops, and how to write a simple | Blackboard and | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : First**

**Subject: Linear Albgebra + MATLAB programming**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | +Application examples | program | PowerPoint | |
| **Week 11** | 2 theoretical + 2 laboratory | Writing the program using (for -end)+ Application examples | Use loop (for -end) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 2 laboratory | Mid-term Exam +Drawing in MATLAB+Application examples | Drawing in MATLAB | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 laboratory | Conditional (if-end) cases+Application examples | Conditional (if-end) cases | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 laboratory | Using the (for-end) and (if-end) conditionals together+Application examples | Using the (for-end) and (if-end) conditionals together | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | use loop(while-end)+ Application examples | use loop(while-end) | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 50. Exam score. Course: 50. Final score: 100

## 10.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | MATLAB Applications for Numerical Solutions," Yassin Ahmed Al-Shuboul, 2004 |
| Main references (sources) | Various on the Internet |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, | http://www.mathworks.com/matlabcentral/ |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Hyllaa A.A.**

**Academic title: Teacher**

**Academic qualification:** MSc.

**Email:**

**hyllaa.77@uomosul.edu.iq**

**Stage : First**

**Subject: Linear Albgebra + MATLAB programming**

## For the academic year 2022-2023

| | |
|---|---|
| Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shaimaa Waleed Mahmood**

**Academic title: Teacher**

**Academic qualification: Msc.**

**Email: shaimaa.waleed@uomosul.edu.iq**

**Stage : First**

**Subject: Elementary Statistics**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: | |
|---|---|
| **Elementary Statistics I** / First stage | |
| 2. Course Code: | |
| CMSI23-F1121 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 1 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | 1- Give the learner the statistical skills that enable him to work in the fields of statistic, calculating measures of statistic.<br>2- The subject of statistics is a digital language and an art to express the variables and numbers accurately, and thus enables the student to benefit from this subject in the statistics and the programs that are important to him in most fields of life.<br>3- Statistics course aims to develop ways and means of thinking and how to deal with various problems.<br>4- Trying to think in sound ways and methods, specifically in solving problems and thus improving and developing society. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students in the statistical methods. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shaimaa Waleed Mahmood**

**Academic title: Teacher**

**Academic qualification: Msc.**

**Email: shaimaa.waleed@uomosul.edu.iq**

**Stage : First**

**Subject: Elementary Statistics**

## For the academic year 2022-2023

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 1 discussion | Definition and importance of statistics | Definition and importance of statistics | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 1 discussion | Statistical Notation Types of statistics | Statistical method in scientific research. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 1 discussion | Data types and methods of collection | Data types and methods of collection | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 1 discussion | Types of Samples | Types of Samples | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 1 discussion | importance and types | Frequency distributions | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 1 discussion | Tabular presentation | Presentation of data Frequency distribution | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 1 discussion | Cumulative distribution | Cumulative distribution | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 1 discussion | Graphical presentation | Graphical presentation | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 1 discussion | Examples | Measures of Central tendency for ungrouped data | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 1 discussion | Examples | Measures of Central tendency for grouped data | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical + 1 discussion | Examples | Properties of central tendency measures | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shaimaa Waleed Mahmood**

**Academic title: Teacher**

**Academic qualification: Msc.**

**Email: shaimaa.waleed@uomosul.edu.iq**

**Stage : First**

**Subject: Elementary Statistics**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 12** | 2 theoretical + 1 discussion | Examples | Measures of dispersion (variation) for ungrouped data | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 1 discussion | Examples | Measures of dispersion (variation) grouped data | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 1 discussion | Examples | Properties of dispersion measurements | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 1 discussion | Examples | Pearson and spearman correlation | Blackboard and PowerPoint | Daily and monthly exams |

### 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

### 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1-Elementary Statistics (2007), Allan Bluman.<br>2- Basics of Statistics (1995), Jarkko Isolalo |
| Main references (sources) | The entrance to statistics (1980) |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |

## Course Description Form

### 1. Course Name:

**Elementary Statistics II** / First stage

### 2. Course Code:

CMSI23-F1121

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shaimaa Waleed Mahmood**

**Academic title: Teacher**

**Academic qualification: Msc.**

**Email: shaimaa.waleed@uomosul.edu.iq**

**Stage : First**

**Subject: Elementary Statistics**

## For the academic year 2022-2023

| 3. Semester / Year: | |
|---|---|
| The second academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 1 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | 1- Give the learner the statistical skills that enable him to work in the fields of engineering, calculating probabilities and linear equations.<br>2- The subject of statistics is a digital language and an art to express the variables and numbers accurately, and thus enables the student to benefit from this subject in the engineering and arithmetic transactions that are important to him in most fields of life.<br>3- Statistics course aims to develop ways and means of thinking and how to deal with various problems.<br>4- Trying to think in sound ways and methods, specifically in solving problems and thus improving and developing society. |
| 7. Teaching and Learning Strategies | |
| **Strategy** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students in the statistical methods. |

8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 1 discussion | Examples | Multiple correlation coefficient | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 1 discussion | Examples | Partial correlation coefficient | Blackboard and | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shaimaa Waleed Mahmood**

**Academic title: Teacher**

**Academic qualification: Msc.**

**Email: shaimaa.waleed@uomosul.edu.iq**

**Stage : First**

**Subject: Elementary Statistics**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | | | PowerPoint | |
| **Week 3** | 2 theoretical + 1 discussion | Examples | Simple linear regression | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 4** | 2 theoretical + 1 discussion | Examples | Multiple linear regression | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 1 discussion | Examples | Testing of hypotheses | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 1 discussion | Examples | Type one and two error | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 1 discussion | Examples | Z –test (one sample) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 1 discussion | Examples | Z –test (two samples) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 1 discussion | Examples | t –test (one sample) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 1 discussion | Examples | t –test (two samples) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical + 1 discussion | Examples | t –test (paired samples) | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 12** | 2 theoretical + 1 discussion | Examples | Confidence Intervals | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 1 discussion | Examples | ANOVA{Analysis of variance (part1)} | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Examples | ANOVA{Analysis of variance (part1)} | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shaimaa Waleed Mahmood**

**Academic title: Teacher**

**Academic qualification: Msc.**

**Email: shaimaa.waleed@uomosul.edu.iq**

**Stage : First**

**Subject: Elementary Statistics**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 15** | 2 theoretical + 1 discussion | Examples | Preparatory week before the final Exam | Blackboard and PowerPoint | Daily and monthly exams |

### 9. Course Evaluation

Endeavor score: 40. Exam score. Course: 60. Final score: 100

### 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1-Elementary Statistics (2007), Allan Bluman.<br>2- Basics of Statistics (1995), Jarkko Isolalo |
| Main references (sources) | The entrance to statistics (1980) |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject: Informatics (1)**

**For the academic year 2022-2023**

# نموذج الوصف المقرر

| | |
|---|---|
| 1. اسم المقرر | |
| Informatics (1) / first stage | |
| 2. رمز المقرر | |
| CMSI22-F1131 | |
| 3. الفصل / السنة | |
| The first academic course | |
| 4. أشكال الحضور المتاحة | |
| Classrooms and laboratories in the Department of Statistics and Informatics | |
| 5. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) | |
| 2theoretical hours and 2 discussion hours/number of units: 3 | |
| 6. اهداف المقرر | |
| Understanding and learning the basics of how computers and information systems work, in addition to learning about the latest technology in the field of computers. | **اهداف المادة الدراسية** |
| 7. استراتيجيات التعليم والتعلم | |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject: Informatics (1)**

## For the academic year 2022-2023

| | |
|---|---|
| The fact that the computer is one of the most important elements and the main reason for the spread and development of modern informatics necessitates getting to know the computer, the history of the computer, the history of the computer, explaining its types, identifying its physical and software parts, and the practical applications of this device in several areas of human life. | الاستراتيجية |

8. بنية المقرر

| Evaluation method | Learning method | Unit or subject name | Required Learning Outcomes | Hours | Week |
|---|---|---|---|---|---|
| Daily and monthly exams | Blackboard and PowerPoint | Introduction to computers | Identifying the computer and the history of its development stages | 2 theoretical + 2 discussion | **Week 1** |
| Daily and monthly exams | Blackboard and PowerPoint | Types of computers | Explaining the types of computers | 2 theoretical + 2 discussion | **Week 2** |
| Daily and monthly exams | Blackboard and PowerPoint | Calculator parts | computer installation | 2 theoretical + 2 discussion | **Week 3** |
| Daily and monthly exams | Blackboard and PowerPoint | Parts of the calculator | Definition of physical parts | 2 theoretical + 2 discussion | **Week 4** |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject: Informatics (1)**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| Daily and monthly exams | Blackboard and PowerPoint | Parts of the calculator | Definition of physical parts | 2 theoretical + 2 discussion | **Week 5** |
| Daily and monthly exams | Blackboard and PowerPoint | Input and output | tools: data entry units and data output units to the computer | 2 theoretical + 2 discussion | **Week 6** |
| Daily and monthly exams | Blackboard and PowerPoint | Central Processing | Unit and its tasks | 2 theoretical + 2 discussion | **Week 7** |
| Daily and monthly exams | Blackboard and PowerPoint | Types of memory in | the calculator: primary and secondary memories | 2 theoretical + 2 discussion | **Week 8** |
| Daily and monthly exams | Blackboard and PowerPoint | Getting to know the screen | Types of screens | 2 theoretical + 2 discussion | **Week 9** |
| Daily and monthly exams | Blackboard and PowerPoint | software software | Basic software and service software | 2 theoretical + 2 discussion | **Week 10** |
| Daily and monthly exams | Blackboard and PowerPoint | Computer operating computer operating systems | computer operating systems | 2 theoretical + 2 discussion | **Week 11** |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject: Informatics (1)**

**For the academic year 2022-2023**

| | | | | | |
|---|---|---|---|---|---|
| Daily and monthly exams | Blackboard and PowerPoint | Computer language Computer languages | Low-level languages and high-level languages | 2 theoretical + 2 discussion | **Week 12** |
| Daily and monthly exams | Blackboard and PowerPoint | Calculator language | is low-level languages | 2 theoretical + 2 discussion | **Week 13** |
| Daily and monthly exams | Blackboard and PowerPoint | Computer language | and high level languages | 2 theoretical + 2 discussion | **Week 14** |
| Daily and monthly exams | Blackboard and PowerPoint | Application software | Service application software | 2 theoretical + 2 discussion | **Week 15** |

9. تقييم المقرر

100Endeavor score: 50. Exam score. Course: 50. Final score: 100

10. مصادر التعلم والتدريس

| | |
|---|---|
| Fundamentals of Information Technology | Required prescribed books<br>)Methodology, if any( |
| Glend Gay and Ronald B., "Information Technology", 3 rd Ed, CSEC,OUP Oxford,2019. | Main references (sources) |
| Public sources from the Internet | Recommended supporting books and references (scientific journals, reports...) |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

| | |
|---|---|
| | المراجع الإلكترونية ، مواقع الانترنيت |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name:** Dr.Alla Hamoodat

**Academic title:** Teacher

**Academic qualification:** Ph.D.

**Email:** allahamoodat@uomosul.edu.iq

**Stage :** First

**Subject:** Informatics (1)

**For the academic year 2022-2023**

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Alla Hamoodat**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: allahamoodat@uomosul.edu.iq**

**Stage : First**

**Subject: Computer**

## For the academic year 2022-2023
## Course Description Form

| 1. Course Name: | |
|---|---|
| Computer/first stage | |
| 2. Course Code: | |
| **UOM103** | |
| 3. Semester / Year: | |
| The second academic course | |
| 4. Available Attendance Forms: | |
| Classrooms and laboratories in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours and 2 discussion hours/number of units: 3 | |
| 6. Course Objectives | |
| **Course Objectives** | 1. Improved Communication: Fast communication can help increase productivity, allow for better business decisions and facilitate company expansion into new regions or countries. The movement of information within organizations or companies has become instantaneous. Employees can easily transfer data across departments without any interruption. Tools such as email, electronic fax, mobile phones, and text messages enhance the movement of information data between employees, customers, and business partners or suppliers, allowing for greater connectivity across internal and external structures.<br>2. • Improved Communication: Fast communication can help increase productivity, allow for better business decisions and facilitate company expansion into new regions or countries. The movement of information within organizations or companies has become instantaneous. Employees can easily transfer data across departments without any interruption. Tools such as email, electronic fax, mobile phones, and text messages enhance the movement of information data between employees, customers, and business partners or suppliers, allowing for greater connectivity across internal and external structures.<br>3. Work: Streamlined workflow systems, shared storage, and collaborative workspaces can increase business efficiency and allow employees to process a greater level of work in a shorter period of time. Information technology systems can be used to |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Alla Hamoodat**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: allahamoodat@uomosul.edu.iq**

**Stage : First**

**Subject: Computer**

## For the academic year 2022-2023

| | |
|---|---|
| | automate routine tasks, to facilitate data analysis and to store data in a way that can be easily retrieved for future use. Technology can also be used to answer customer questions through email, in a real-time chat session, or through a phone routing system that connects the customer to an available customer service agent.<br>• Cost Reduction and Economic Efficiency: Communication technology and social technology have made business promotion and product launch affordable. Many small businesses have found ways to use social technology to increase their brand awareness and get more customers for less. In business, factors such as operating cost play an important role in business development and growth. So when companies use information technology to reduce operating costs, the return on investment will increase, which will lead to business growth. |

## 7. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials by Using appropriate teaching strategies and methods and teaching aids to develop thinking skills. |

## 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical + 2 discussion | Getting to know the computer and the history of its stages of development - indicating the types of computers - installing the computer - defining the physical parts | Introduction | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 2** | 2 theoretical + 2 discussion | Data entry units and data output units to the computer - The central processing unit and its tasks | Data entry | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 3** | 2 theoretical + 2 discussion | Primary and secondary memories - Types of displays | Memories | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Alla Hamoodat**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: allahamoodat@uomosul.edu.iq**

**Stage : First**

**Subject: Computer**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 4** | 2 theoretical + 2 discussion | Software | Software | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 5** | 2 theoretical + 2 discussion | Computer operating systems | Computer operating | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 6** | 2 theoretical + 2 discussion | Low-level languages and high-level languages | Languages | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 7** | 2 theoretical + 2 discussion | Service application software | Application | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 8** | 2 theoretical + 2 discussion | Getting to know the Word program - How to open or run the program - Transforming the Word program interface - Word program menus. | Word | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 9** | 2 theoretical + 2 discussion | Home Toolbar - Home Page Insert Menu - Toolbar - Insert Menu - Page Layout | Home Toolbar | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 10** | 2 theoretical + 2 discussion | Microsoft Excel - the most common uses of the Excel program - opening the Excel program - closing the Excel program - an explanation of the main toolbar of the Excel program | Microsoft Excel. | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 11** | 2 theoretical + 2 discussion | Entering data in Excel program - how to navigate in a worksheet - inserting a function from the ready-made functions | Excel | Blackboard and PowerPoint | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Alla Hamoodat**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: allahamoodat@uomosul.edu.iq**

**Stage : First**

**Subject: Computer**

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| | | into a cell - examples - shading cells - clearing cells | | | |
| **Week 12** | 2 theoretical + 2 discussion | The basics of building a POWER POINT presentation - entering the program and the program interface - creating a new presentation | POWER POINT | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 13** | 2 theoretical + 2 discussion | Open a presentation file - save a presentation - insert a new slide - add shapes to the slide - slide margins - slide design - add animations to the slide | Open a presentation file | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 14** | 2 theoretical + 2 discussion | Internet - services provided by the Internet - keywords, comprehensive search engines | Internet | Blackboard and PowerPoint | Daily and monthly exams |
| **Week 15** | 2 theoretical + 2 discussion | Create an E-mail | E-mail | Blackboard and PowerPoint | Daily and monthly exams |

## 9. Course Evaluation

Endeavor score: 50. Exam score. Course: 50. Final score: 100

## 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Fundamentals of Information Technology |
| Main references (sources) | Glend Gay and Ronald B., "Information Technology", 3 rd Ed, CSEC,OUP Oxford,2019. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Alla Hamoodat**

**Academic title: Teacher**

**Academic qualification: Ph.D.**

**Email: allahamoodat@uomosul.edu.iq**

**Stage : First**

**Subject: Computer**

## For the academic year 2022-2023

| | |
|---|---|
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | Various on the Internet |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shyma S. Mohammd.**

**Academic title: Teacher**

**Academic qualification:**

**Email:** shymshak@uomosul.edu.iq

**Stage : first**

**Subject: Basics Programming**

## For the academic year 2022-2023
## Course Description Form

| | | | |
|---|---|---|---|
| **Module Title** | **Basics Programming** | | |
| **Module Type** | **Basic** | | |
| **Module Leader's Acad. Title** | Assistant Lecturer | **Module Leader's Qualification** | MSc. |
| **Module Tutor** | Husham Y. A. Alameen | **e-mail** | hisham.alameen@uomosul.edu.iq |

| **Module Aims, Learning Outcomes and Indicative Contents**<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | The objective is to learn the student the fundamental of programming through practical application using the C++ programming language. In this course, students will learn about: The basic programming and OOPs concepts. Creating C++ programs, Tokens, expressions and control structures in C++. Arranging same data systematically with arrays. Classes and objects in C++. Constructors and destructors in C++. Files management and templates in C++. Handling exceptions to control errors. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | After completing this course, the student will have acquired basic information in the science of computer programming through the following outcomes for learning this module, and these outcomes are:<br>1. Understand tokens, expressions, and control structures.<br>2. Explain arrays and strings and create programs using them.<br>3. Describe and use constructors and destructors.<br>4. Understand and employ file management.<br>5. Demonstrate how to control errors with exception handling.<br>6. Use functions and pointers in C++ program.<br>7. Describe OOPs concepts. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>Part A – Introduction C++ and Basic programming<br><br>Understanding Language Features, history, covers C++ statements and expressions, constants, variables, operators, and how to control execution flow in applications. Exploring C++ Types, describes C++ built-in types, aggregated types, type aliases, initializer lists, and conversion between types. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shyma S. Mohammd.**

**Academic title: Teacher**

**Academic qualification:**

**Email:** shymshak@uomosul.edu.iq

**Stage : first**

**Subject: Basics Programming**

## For the academic year 2022-2023

| | |
|---|---|
| | Rules of C++ programming, structure of C++ program, C++ Tokens (Identifiers, Keywords, Constants, Operators, Special characters), C++ data types (Basic, Derived, User defined). Console I/O statements (cin, cout), programs to perform various calculations, programs to implement various operators. [15 hrs]<br>Arrays and Control statements: definition, advantages, array types, single dimension, double dimension, declaration, accessing array data, implementation of array operations. Conditional control statements, if-else, switch-case, loops, while, do while, for. Implementing programs on conditional & loops, break, continue, go to keywords. [15 hrs]<br>Part B – Functions and Object-oriented programming<br>Gives a thorough description of the fundamental characteristics of the object-oriented C++ programming language. In addition, students are introduced to the steps necessary for creating a fully functional C++ program. Many examples are provided to help enforce these steps and to demonstrate the basic structure of a C++ program. [15 hrs]<br>Describes how to declare and call standard functions. This will also teach students to use standard classes, including standard header files. In addition, students work with string variables for the first time in this topic. Explains the use of streams for input and output, with a focus on formatting techniques. Formatting flags and manipulators are discussed, as are field width, fill characters, and alignment. [7 hrs]<br><br>Introduces operators needed for calculations and selections. Binary, unary, relational, and logical operators are all examined in detail. Also, describes the statements needed to control the flow of a program. These include loops with while, do-while, and for; selections with if-else, switch, and the conditional operator; and jumps with goto, continue, and break. [15 hrs] |
| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shyma S. Mohammd.**

**Academic title: Teacher**

**Academic qualification:**

**Email:** shymshak@uomosul.edu.iq

**Stage : first**

**Subject: Basics Programming**

## For the academic year 2022-2023

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | Structure of Simple C++ Programs |
| **Week 2** | Fundamental Types: characters identifiers, variable declaration, constants. |
| **Week 3** | Operators for fundamental types: Binary Arithmetic Operators, Unary Arithmetic Operators, Relational Operators, Logical Operators. |
| **Week 4** | Arithmetic operations: converting arithmetic types, implicit type conversions, performing usual arithmetic type conversions, more type conversions. |
| **Week 5** | Arrays: defining arrays, initializing arrays, class arrays, multidimensional arrays, member arrays. |
| **Week 6** | Library files " header" |
| **Week 7** | Assign statements |
| **Week 8** | Conditional statements |
| **Week 9** | Control Flow: loops, the for statement, the while statement, the do-while statement, selections with if-else. |
| **Week 10** | Control Flow to complete: else-if chains, conditional expressions, selecting with switch, jumps with break, continue, and go to. |
| **Week 11** | The Standard Class string: defining and assigning strings, concatenating strings, comparing strings, inserting and erasing in strings, searching and replacing in strings, accessing characters in strings. |
| **Week 12** | Input and Output with Streams: streams, formatting and manipulators, formatted output of integers, formatted output of floating-point numbers, output in fields, output of characters. |
| **Week 13** | Functions: significance of functions in C++, defining functions, return value of functions, passing arguments, inline functions. |
| **Week 14** | Functions: default arguments, overloading functions, recursive functions. |
| **Week 15** | Strings, and Boolean values, formatted input, formatted input of numbers, unformatted input/output. |
| **Week 16** | **Preparatory week before the final Exam** |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Shyma S. Mohammd.**

**Academic title: Teacher**

**Academic qualification:**

**Email:** shymshak@uomosul.edu.iq

**Stage : first**

**Subject: Basics Programming**

## For the academic year 2022-2023

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: An introduction to installing programs on a computer, C++ installation with its libraries. |
| **Week 2** | Lab 2: Characters identifiers |
| **Week 3** | Lab 3: Variables declaration |
| **Week 4** | Lab 4: Constants |
| **Week 5** | Lab 5: Arithmetic operations |
| **Week 6** | Lab 6: library files " header" |
| **Week 7** | Lab 7: Assign statement |
| **Week 8** | Lab 8: "if "conditional statements |
| **Week 9** | Lab 9: "if – else "conditional statements |
| **Week 10** | Lab 10: Array |
| **Week 11** | Lab 11:" for loop" |
| **Week 12** | Lab 12:"while loop" |
| **Week 13** | Lab 13: Functions |
| **Week 14** | Lab 14: Functions |
| **Week 15** | Lab 15: String |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Assistant teacher**

**Academic qualification: Master's**
**Email: Marwa-dnan@uomosul.edu.iq**

**Stage : First**

**Subject:** Arabic Language

## For the academic year 2022-2023
## Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Arabic Language/ The first stage | |
| 2. Course Code: | |
| UOM101 | |
| 3. Semester / Year: | |
| The first academic course | |
| 4. Available Attendance Forms: | |
| Classrooms in the Department of Statistics and Informatics | |
| 5. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical hours | |
| 6. Course Objectives | |
| **Course Objectives** | • 1- Getting to know Arabic speech: in terms of its definition, its divisions, and the signs of each division.<br>• 2- Knowledge of the Arabic sentence, the parts of the Arabic sentence, nominal sentences, and verbal sentences<br>• 3- Identifying parsing movements: whether they are original or subsidiary<br>• 4- The student's knowledge of the Arabic language: in terms of health and condition<br>• 5- The student's knowledge of the Arabic verb in terms of imposition and transitivity<br>• 6- Knowledge of the Arabic verb in terms of tense for the student<br>• 7- Ways to write the number, masculine, and feminine<br>• 8- Knowing punctuation marks in speech<br>• 9- Learn the rules of drawing the hamza<br>• 10- Learn how to write the marbuta and masbutah ta'<br>• 11- Say and do not say: common mistakes made by speakers and writers<br>• 12- Knowing what the news style is,<br>• 13- Knowing what the construction method is, |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Assistant teacher**

**Academic qualification: Master's**
**Email: Marwa-dnan@uomosul.edu.iq**

**Stage : First**

**Subject:** Arabic Language

## For the academic year 2022-2023

| | |
|---|---|
| | • 14- Learning linguistic skills: developing linguistic flair and improving learners' style |

### 7. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | The main strategy that will be adopted in presenting this unit is to encourage students to participate in speaking and writing Arabic correctly, while improving and expanding critical thinking skills at the same time. This will be accomplished through interactive classes and tutorials and by looking at types of simple experiments that include some sampling activities of interest to students. |

### 8. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| **Week 1** | 2 theoretical | definition, divisions, and signs of each division | Arabic speech: | Blackboard | Daily and monthly exams |
| **Week 2** | 2 theoretical | : its definition, its sections: nominal and verbal | The Arabic sentence | Blackboard | Daily and monthly exams |
| **Week 3** | 2 theoretical | original, subsidiary | Parsing movements: | Blackboard | Daily and monthly exams |
| **Week 4** | 2 theoretical | terms of health and well-being | The Arabic verb: in | Blackboard | Daily and monthly exams |
| **Week 5** | 2 theoretical | in terms of immanence and transitivity | The Arabic verb | Blackboard | Daily and monthly exams |
| **Week 6** | 2 theoretical | in terms of the imperative | The Arabic verb | Blackboard | Daily and monthly exams |
| **Week 7** | 2 theoretical | Review and exam | Review and exam | Blackboard | Daily and monthly exams |
| **Week 8** | 2 theoretical | For a number: a ticket, and its feminization | For a number | Blackboard | Daily and monthly exams |
| **Week 9** | 2 theoretical | Punctuation marks in speech | Punctuation marks in speech | Blackboard | Daily and monthly exams |
| **Week 10** | 2 theoretical | Rules for drawing hamza | Rules for drawing hamza | Blackboard | Daily and monthly exams |
| **Week 11** | 2 theoretical | The marbuta tā' and the masbūtah | The marbuta tā' and the masbūtah | Blackboard | Daily and monthly exams |

**Ministry of Higher Education and Scientific Research**
**College of Computer Science and Mathematics**
**University of Mosul**
**Department of Statistics and Informatics**

**Lecturer's name: Dr.Safwan N. R.**

**Academic title: Assistant teacher**

**Academic qualification: Master's**
**Email: Marwa-dnan@uomosul.edu.iq**

**Stage : First**

**Subject:** Arabic Language

## For the academic year 2022-2023

| | | | | | |
|---|---|---|---|---|---|
| **Week 12** | 2 theoretical | Say and do not say: common mistakes made by speakers and writers | Say and do not say | Blackboard | Daily and monthly exams |
| **Week 13** | 2 theoretical | News style Structural style | News style Structural style | Blackboard | Daily and monthly exams |
| **Week 14** | 2 theoretical | Linguistic skills: developing linguistic | Linguistic skills: | Blackboard | Daily and monthly exams |
| **Week 15** | 2 theoretical | flair and improving learners' style | flair and improving | Blackboard | Daily and monthly exams |

### 9. Course Evaluation

Endeavor score: 50. Exam score. Course: 50. Final score: 100

### 10. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | ين ذريل، عدنان " اللغة والأسلوب دراسة" الطبعة الثانية، 2006 |
| Main references (sources) | 2000بحيري، سعيد حسن، "الاساس في فقه اللغة العربية"، |
| Recommended books and references (scientific journals, reports…) | |
| Electronic References, Websites | |