MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

**Applied Physics**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | Linear Algebra and Statistics | | | | **Module Delivery** | | |
| **Module Type** | C | | | | * **☒ Theory** * **☒ Lecture** * **☒ Lab** * **☐ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | GEO1205 | | | |
| **ECTS Credits** | 5 | | | |
| **SWL (hr/sem)** | 125 | | | |
| **Module Level** | | 2nd | **Semester of Delivery** | | | | 2nd |
| **Administering Department** | | **Geophysics** | **College** | **Remote sensing & Geophysics** | | | |
| **Module Leader** | **Ali Khalid Khudhayir** | | **e-mail** | [ali.khdayir@kus.edu.iq](mailto:ali.khdayir@kus.edu.iq) | | | |
| **Module Leader’s Acad. Title** | | **Lecturer** | **Module Leader’s Qualification** | | | | **MSc. Method of teaching mathematics** |
| **Module Tutor** |  | | **e-mail** |  | | | |
| **Peer Reviewer Name** | |  | **e-mail** |  | | | |
| **Scientific Committee Approval Date** | | **15/5/2023** | **Version Number** | | | 2 | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | **Null** | **Semester** |  |
| **Co-requisites module** | **Null** | **Semester** |  |

|  |  |
| --- | --- |
| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
| **Module Aims**  **أهداف المادة الدراسية** | 1. Learn about the properties of matrices and determinants 2. Identify the characteristics of descriptive and inferential statistics 3. Learn about vectors and vector space 4. Learn about statistical metrics |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 1. Calculating determinants using properties 2. Calculation of vectors in space R2 and R3 3. find the orthogonality 4. Using descriptive statistics to describe natural phenomena 5. The use of inferential statistics in data analysis |
| **Indicative Contents**  **المحتويات الإرشادية** | 1. At the beginning of the semester, students are informed of the course vocabulary and information sources |

|  |  |
| --- | --- |
| **Learning and Teaching Strategies**  **استراتيجيات التعلم والتعليم** | |
| **Strategies** | 1. Lecture method 2. standard method 3. inductive method |

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Workload (SWL)**  **الحمل الدراسي للطالب** | | | |
| **Structured SWL (h/sem)**  **الحمل الدراسي المنتظم للطالب خلال الفصل** | 100 |  |  |
| **Unstructured SWL (h/sem)**  **الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 25 |  |  |
| **Total SWL (h/sem)**  **الحمل الدراسي الكلي للطالب خلال الفصل** | 125 | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) |  |  |
| **Assignments** | 2 | 10% (10) |  |  |
| **Projects / Lab.** | 1 | 10% (10) |  |  |
| **Report** | 1 | 10% (10) |  |  |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) |  |  |
| **Final Exam** | 2hr | 50% (50) |  |  |
| **Total assessment** | | | 100% (100 Marks) |  |  |

|  |  |
| --- | --- |
| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **Material Covered** |
| **Week 1** | Algebra of matrices |
| **Week 2** | **Determents, Cramers Rule** |
| **Week 3** | System of Linear Equation |
| **Week 4** | Vectors |
| **Week 5** | Eigenvalues and Eigenvectors |
| **Week 6** | Polynomials of matrices |
| **Week 7** | Exam |
| **Week 8** | Vector space in R2 |
| **Week 9** | Vector space in R3 |
| **Week 10** | Measures of Central Tendency |
| **Week 11** | Measures of Dispersion |
| **Week 12** | **Discrete Probability Distributions** |
| **Week 13** | Normal Distributions |
| **Week 14** | **Tests of Hypotheses** |
| **Week 15** | **Exam** |
| **Week 16** | **Preparatory week before the final Exam** |

|  |  |
| --- | --- |
| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| **Week** | **Material Covered** |
| **Week 1-2** |  |
| **Week 3-4** |  |
| **Week 5-6** |  |
| **Week 7-8** |  |
| **Week 9-10** |  |
| **Week 11-12** |  |
| **Week 13-14** |  |

|  |  |  |
| --- | --- | --- |
| **Learning and Teaching Resources**  **مصادر التعلم والتدريس** | | |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | 1. **Calculus and Analytical Geometry by Thomas and Finney (2005), 11th Ed., Addison Wesley.** 2. **Walpole, R.E.1968. Introduction to Statistics. Macmillan company, New York.** |  |
| **Recommended Texts** | 1. **Calculus by Howard Anton, Bivens and Stephen Davis (2009), 9th Ed. John wiley and Sons, NC.** 2. **Chao, L.L.1969. Statistics methods and Analyses, Mc Graw. Hill, New York.** |  |
| **Websites** | Varies lectures and lecture notes on the internet | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grading Scheme**  **مخطط الدرجات** | | | | |
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group**  **(50 - 100)** | **A -** Excellent | **امتياز** | 90 - 100 | Outstanding Performance |
| **B -** Very Good | **جيد جدا** | 80 - 89 | Above average with some errors |
| **C -** Good | **جيد** | 70 - 79 | Sound work with notable errors |
| **D -** Satisfactory | **متوسط** | 60 - 69 | Fair but with major shortcomings |
| **E -** Sufficient | **مقبول** | 50 - 59 | Work meets minimum criteria |
| **Fail Group**  **(0 – 49)** | **FX –** Fail | **راسب (قيد المعالجة)** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
|  |  |  |  |  |
| **Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. | | | | |