MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | Electrical Methods | | | | **Module Delivery** | | |
| **Module Type** | Core | | | | * **☒ Theory** * **☒ Lecture** * **☒ Lab** * **☐ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | GEO31115 | | | |
| **ECTS Credits** | 8 | | | |
| **SWL (hr/sem)** | 150 | | | |
| **Module Level** | | 3ed | **Semester of Delivery** | | | | 1st |
| **Administering Department** | | Geophysics Department | **College** | Remote Sensing and Geophysics College | | | |
| **Module Leader** | Ahmed Srdah Kahdem | | **e-mail** | Ahmed.srdah@yahoo.com | | | |
| **Module Leader’s Acad. Title** | | Lecturer | **Module Leader’s Qualification** | | | |  |
| **Module Tutor** |  | | **e-mail** |  | | | |
| **Peer Reviewer Name** | |  | **e-mail** |  | | | |
| **Scientific Committee Approval Date** | |  | **Version Number** | | |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | Fundamentals of Geophysics | **Semester** |  |
| **Co-requisites module** | Electrical and Magnetic Physics | **Semester** |  |

|  |  |
| --- | --- |
| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
| **Module Aims**  **أهداف المادة الدراسية** | 1-Learn what Resistivity Method.  2- Learn what Self-Potential Method.  3- Learn what Induced Polarization Method.  4- Identify all techniques in these methods.  5- Identify the different methods for calculating the electrical conductivity or resistivity by used these methods. |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 1. The student distinguishes between the types of Electrical Methods. 2. These methods have been used for many decades in hydrogeological, mining, geotechnical, archeological, environmental and engineering investigation. |
| **Indicative Contents**  **المحتويات الإرشادية** |  |

|  |  |
| --- | --- |
| **Learning and Teaching Strategies**  **استراتيجيات التعلم والتعليم** | |
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students to use the surface geophysical techniques that providing a relatively quick and inexpensive data to characterize the subsurface , while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, field work by use of different measuring devices. |

|  |  |  |  |
| --- | --- | --- | --- |
| **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** | 50 |  |  |
| **Total SWL (h/sem)**  **الحمل الدراسي الكلي للطالب خلال الفصل** | 150 | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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** | Basic principles of Electrical Methods |
| **Week 2** | The resistivity method. |
| **Week 3** | Electrical Conductivity of The Earth Materials. |
| **Week 4** | Electrodes Arrays. |
| **Week 5** | Electrodes Arrays. |
| **Week 6** | Parameters Controlling Investigation Depth. |
| **Week 7** | One-Dimension (1D) Resistivity Techniques |
| **Week 8** | Constant Separation Traverse (CST) or Horizontal Profiling Technique |
| **Week 9** | Constant Separation Traverse (CST) or Horizontal Profiling Technique |
| **Week 10** | Vertical Electrical Sounding (VES) Technique. |
| **Week 11** | Data Processing of Vertical Electrical Sounding (VES). |
| **Week 12** | Interpretation of (VES) Data. |
| **Week 13** | Self‐potential (SP) Method. |
| **Week 14** | Induced polarization method |
| **Week 15** | General principles of IP and measured parameters |
| **Week 16** | **Preparatory week before the final Exam** |

|  |  |
| --- | --- |
| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| **Week** | **Material Covered** |
| **Week 1** | Problem (1) Apparent Resistivity Measurements |
| **Week 2** | Problem (2) Resistivity Profile or Constant Separation Travers (CST). |
| **Week 3** | Problem (3) Geometrical factors of Vertical electrical sounding (VES) |
| **Week 4** | Problem (4) Partial curve matching or auxiliary point method |
| **Week 5** | Problem (5) Representation of Quantitative Interpretation Results |
| **Week 6** | Problem (6) Interpretation of IP Data |
| **Week 7** | Problem (7) Interpretation of Self‐Potential Data |

|  |  |  |
| --- | --- | --- |
| **Learning and Teaching Resources**  **مصادر التعلم والتدريس** | | |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Al-Zubedi, A. S., 2015b. Principles of Electrical Resistivity Techniques. LAP LAMBERT Academic Publishing Company, Germany, 147 p.  Keller, G. V., and Frischknecht, F. C., 1982. Electrical methods in geophysical  prospecting, Third edition, Pegamon press Inc., Oxford, 523P. | YES |
| **Recommended Texts** | Loke, M. H., 2020. Tutorial: 2-D and 3D Electrical Imaging Surveys, 221p. |  |
| **Websites** |  | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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. | | | | |