MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Petrology | **Module Delivery** |
| **Module Type** | Core | * **☒ Theory**
* **☒ Lecture**
* **☒ Lab**
* **☐ Tutorial**
* **☐ Practical**
* **☐ Seminar**
 |
| **Module Code** | RGC2103 |
| **ECTS Credits**  | 6 |
| **SWL (hr/sem)** | 150 |
| **Module Level** | 2nd  | **Semester of Delivery** | 1st  |
| **Administering Department** | Geophysics |  **College** | College of Geophysics and Remote Sensing |
| **Module Leader** | Dr. Amani L. M. salih |  **e-mail** | Aman79.jk@gmail.com |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Petrology |
| **Module Tutor** | None  |  **e-mail** |  |
| **Peer Reviewer Name** | None  |  **e-mail** |  |
| **Scientific Committee Approval Date** | 16 / 6 / 2023 | **Version Number** | 2 |

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

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| **Module Aims, Learning Outcomes and Indicative Contents****أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** |
|  **Module Aims****أهداف المادة الدراسية** | To provide a foundation in igneous, metamorphic, and sedimentary petrology, to serve as a basis for more detailed courses in the coming years, and to provide a basic understanding of the role of magmatic and igneous rocks in the Earth, with particular reference to the conditions under, which magma is formed, the major types of magma, and the movement and presence (or eruption) of magmas) magma and its eventual solidification. To study the minerals and textures of igneous rocks. To study the ways in which a great variety of igneous rocks can be produced from relatively few types of magma. To study active volcanoes and their behavior, as direct evidence of magmatic processes. To provide an introduction to metamorphic rocks, their classification and nomenclature To study the minerals and textures of metamorphic rocks and use them to infer pressures and temperatures of metamorphism, and the role of deformation To investigate the possible tectonic processes and environments in which metamorphic rocks are formed As well as sedimentation processes for different sedimentary rocks |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | Upon completion of this course, the student will be able to: Understand the basic elements of igneous and metamorphic rocks Apply basic knowledge and practical skills to interpret the characteristics of igneous and metamorphic rocks Improving the skills of observation and description of igneous and metamorphic minerals in hand samples and rock slides Describe and identify the most important igneous and metamorphic rock types, both in hand samples and in rock slides Use different graphical methods to help interpret rock formation |
| **Indicative Contents****المحتويات الإرشادية** | Through explanations and applications, using display screens, and presenting scientific films that explain the reality of what happens in nature.  |

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| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | Class Lecture Laboratory Practical Training Tutorial Seminar |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 86 |  |  |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 64 |  |  |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 150 |

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| **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
|  | Introduction to Igneous Petrology |
|  | An Introduction to Igneous Phase Diagrams and Silicate Melts and Magmas |
|  | The Chemistry of Igneous Rocks and Basalts and Mantle Structure |
|  | Convergent Margin Magmatism |
|  | Intracontinental Volcanism and Interpretation of Granitic Rocks |
|  | Sedimentology and Sedimentary rocks Introduction |
|  | Erosion, transportation, sedimentation, and lithification |
|  | Sedimentary structures  |
|  | Sandstone and Limestone |
|  | Introduction to sedimentary facies |
|  | Exam  |
|  | Introduction to Metamorphic Petrology & Interpretation of Metamorphic Phase Diagrams |
|  | Metamorphic Facies and the Metamorphism of Mafic Rocks |
|  | Metamorphism of Peridotitic Rocks |
|  | Regional Occurrence and Tectonic Significance of Metamorphic Rocks |
|  | **Preparatory week before the final Exam** |

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| **Delivery Plan (Weekly Lab. Syllabus)****المنهاج الاسبوعي للمختبر** |
| **Week**  | **Material Covered** |
|  | Microscope parts |
|  | Sandstone under Microscope |
|  | Sediment size, size distribution, and sorting |
|  | Pettijon and Folk classification  |
|  | Limestone under Microscope |
|  | Denham classification |
|  | Facies identification  |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Grotzinger & Jordan, *Understanding Earth*, Chapters 4, 6 and 12.Marshak, *Portrait of a Planet*, Chapters 6, 8, 9,11. | no |
| **Recommended Texts** | Klein & Philpotts,  *Earth Materials: Introduction to Mineralogy and Petrology,* Chapters 7, 8, 9, 13, 14Hefferan & O’Brien,  *Earth Materials*, Chapter 7Duff, *Holmes' Principles of Physical Geology*, Chapters 12 and 13.Mason, *Petrology of the Metamorphic Rocks (2nd edition).*Cox, Price & Harte, T*he Practical Study of Crystals, Minerals and Rocks (2nd edition)*, Chapter 10.MacKenzie & Adams, *A Colour Atlas of Rocks and Minerals in Thin Section*. | no |
| **Websites** | <https://ocw.mit.edu/courses/find-by-topic/#cat=science&subcat=earthscience&spec=geophysics>  |

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|  **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 |
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| **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. |