MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module Title** | Cloud Computing | | | | **Module Delivery** | | |
| **Module Type** | Elective | | | | * **☒ Theory** * **☐ Lecture** * **☒ Lab** * **☐ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | BMI411 | | | |
| **ECTS Credits** | 5 | | | |
| **SWL (hr/sem)** | 125 | | | |
| **Module Level** | | 4 | **Semester of Delivery** | | | | 7 |
| **Administering Department** | | BID | **College** | BMIC | | | |
| **Module Leader** | Usama Samir Mahmoud | | **e-mail** | usama.s.mahmoud@uoitc.edu.iq | | | |
| **Module Leader’s Acad. Title** | | Asst. Lecturer | **Module Leader’s Qualification** | | | | MSc |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | | | |
| **Peer Reviewer Name** | | omar A. M | **e-mail** | omara.m@uoitc.edu.iq | | | |
| **Scientific Committee Approval Date** | | 18/06/2023 | **Version Number** | | | 1.0 | |

| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| --- | --- | --- | --- |
| **Prerequisite module** | Web development / BID321 | **Semester** | 6 |
| **Co-requisites module** | None | **Semester** |  |

| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
| --- | --- |
| **Module Aims**  **أهداف المادة الدراسية** | 1. The student should be able to understand the basics of Cloud technology 2. The student should be able to manage cloud computing concepts. 3. The student should be able to understand Grid Computing vs Cloud Computing. 4. The student should be able to create and deal with virtual machines. 5. The student should be able to create containers and deal with them. 6. The student should be able to understand the steps of creating a private cloud environment. |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 1. An ability to understand the basics of Cloud technology. 2. Understand the steps of creating private cloud environment |
| **Indicative Contents**  **المحتويات الإرشادية** | **What we will covers in this course**   1. Clustering   The basic concept of built-in redundancy and failover is core to cloud platforms. Clustering technology is explored further in Chapter 8 as part of the Resource Cluster mechanism description.   1. Grid Computing   A computing grid (or “computational grid”) provides a platform in which computing resources are organized into one or more logical pools. These pools are collectively coordinated to provide a high performance distributed grid, sometimes referred to as a “super virtual computer.”   1. Virtualization   Virtualization represents a technology platform used for the creation of virtual instances of IT resources. A layer of virtualization software allows physical IT resources to provide multiple virtual images of themselves so that their underlying processing capabilities can be shared by multiple users.   1. Cloud   A cloud refers to a distinct IT environment that is designed for the purpose of remotely provisioning scalable and measured IT resources. The term originated as a metaphor for the Internet which is, in essence, a network of networks providing remote access to a set of decentralized IT resources. |

| **Learning and Teaching Strategies**  **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 and by considering type of simple experiments involving some sampling activities that are interesting to the students. |

| **Student Workload (SWL)**  **الحمل الدراسي للطالب** | | | |
| --- | --- | --- | --- |
| **Structured SWL (h/sem)**  **الحمل الدراسي المنتظم للطالب خلال الفصل** | 64 | **Structured SWL (h/w)**  **الحمل الدراسي المنتظم للطالب أسبوعيا** | 4 |
| **Unstructured SWL (h/sem)**  **الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 61 | **Unstructured SWL (h/w)**  **الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 4 |
| **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) | 5, 10 | LO #1, 2, |
| **Assignments** | 2 | 10% (10) | 2, 12 | LO # 1,2 |
| **Projects / Lab.** | 1 | 10% (10) | Continuous |  |
| **Report** | 1 | 10% (10) | 13 | LO # 1,2 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-2 |
| **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) |  |  |

| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| --- | --- |
| **Week** | **Material Covered** |
| **Week 1** | Introduction - History of the Cloud, Types of Cloud Services |
| **Week 2** | Anatomy of the cloud network |
| **Week 3** | Overall vision, Expected results, Required functionality |
| **Week 4** | The Role of Grid Computing Technologies in Cloud Computing |
| **Week 5** | The Role of Grid Computing Technologies in Cloud Computing 2 |
| **Week 6** | Cloud Computing Versus Cloud Services |
| **Week 7** | 1st exam |
| **Week 8** | What is Virtualization, What Virtualization, RESOURCE OPTIMIZATION |
| **Week 9** | What is Virtualization 2, What is a hypervisor, Types of Virtualization |
| **Week 10** | What is Virtualization 3, Server Virtualization, Network Virtualization |
| **Week 11** | What is a Container? |
| **Week 12** | What is a Cluster? An Overview of Clustering in the Cloud |
| **Week 13** | A Cloud Computing Based Patient Centric Medical Information System |
| **Week 14** | A Cloud Computing Based Patient Centric Medical Information System 2 |
| **Week 15** | Seminars and discussion |

| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| --- | --- |
| **Week** | **Material Covered** |
| **Week 1-2** | Lab 1: Google cloud services |
| **Week 3-4** | Lab 2: amazon cloud services |
| **Week 5-6** | Lab 3: Proxmox for server virtualization |
| **Week 7-8** | Lab 4: container in Proxmox |
| **Week 9-10** | Lab 5: virtual machine in Proxmox |
| **Week 11-12** | Lab 6: Datacenter with Proxmox |
| **Week 13-14** | Lab 7: Datacenter with Proxmox 2 |
| **Week 15** | Review and Discussions |

| **Learning and Teaching Resources**  **مصادر التعلم والتدريس** | | |
| --- | --- | --- |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Handbook of Cloud Computing By Borko Furht · Armando Escalante,  Zen of Cloud\_ Learning Cloud Computing by Examples Ed 2,  The Complete Cloud Computing Manual - 5th Edition 2020 | NO |
| **Recommended Texts** |  | No |
| **Websites** | https://www.proxmox.com/ | |

| **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. | | | | |