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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | English Language | **Module Delivery** |
| **Module Type** | Support or related learning activity | * **☒ Theory**
* **☒ Lecture**
 |
| **Module Code** | ENLA107 |
| **ECTS Credits**  | 2 |
| **SWL (hr/sem)** | 50 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CES.OP |  **College** |  CES |
| **Module Leader** | Dr. Ban Kadhim Abed  |  **e-mail** | Ban.K.Abed@uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Assistant Professor  | **Module Leader’s Qualification** | PhD |
| **Module Tutor** | Name (if available) |  **e-mail** | E-mail |
| **Peer Reviewer Name** | Asst. Prof. Dr. Bashir Yousif Sherhan |  **e-mail** | Bashir.Y.Sherhan@uotechnology.edu.iq |
| **Scientific Committee Approval Date** |  | **Version Number** | 1 |

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| **Relation with other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **Semester** |  |
| **Co-requisites module** | None | **Semester** |  |

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| **Module Aims, Learning Outcomes and Indicative Contents****أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** |
|  **Module Aims****أهداف المادة الدراسية** | This module aims to enhance the communication skills of students whose English language level is equivalent to the first-year undergraduate students in the Chemical Engineering Department. There will be a particular focus on developing the four language skills (speaking, listening, reading and writing) and on broadening students' vocabulary and grammatical range so that they can communicate easily on a wide range of topics. In addition, to teaching the technical English vocabulary that the student needs in his/her academic engineering studies and in his/her professional life as a chemical engineer in factories. |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. The course covers the core language and skills students need to communicate successfully in engineering specializations.2. Express their opinions and participate in discussions on a wide range of topical issues.3. Communicate effectively in written format on a range of contemporary topics, especially the technical ones.4. Understand the key points of a range of moderately complex oral and written texts with relative ease.5. Communicate effectively as part of a multicultural group.6. Manage, interpret and create meaning using a variety of digital devices and tools.7. An accurate description of the nature of the vocabulary and expressions used by chemical engineers in dealing with their fields of specialization, and then trying to simulate that in writing reports, expression, and formulating simple and complex sentences. |
| **Indicative Contents****المحتويات الإرشادية** | 1. **Communicative competences**

**Listening** - Understand and identify the main points of dialogues of 230-250 words on familiar topics that are regularly encountered in life, work, university, etc., within the scope of the syllabus. - Listen and guess the meanings of speakers' expressions and feelings in monologues and familiar conversations in everyday life. - Understand the main points of news programs, broadcasts, interviews, etc., on familiar topics given clearly, in simple language, or with illustrative images (pictograms).**Speaking** – Pronunciation of short dialogues clearly and accurately. - Speak and interact with fellow speakers about familiar topics, express personal points of view and share information on topics covered in the curriculum. - Describe in simple discourse familiar topics while telling a short story related to the topics covered. – Presenting projects related to curriculum topics in an accurately prepared manner.**Reading** - Read and comprehend the main points and specific contents of a 200-word text on current and familiar topics. - Read and understand the flow of argument for texts, identify key conclusions in texts using plain language. - Reading to find and summarize short texts for daily use, including those related to the work of the chemical engineer, such as excerpts from scientific books, and the use of words and structures from the original texts.**Writing** – write paragraphs (i.e., block and indented styles), Write simple connected and coherent texts of 180-200 words; write short reports based on suggestions, providing factual information and reasons for recommendations in the reports; collect short information from several sources and summarize it. - Complete (write/fill) administrative forms such as CVs and resumes, employment application letter, emails, etc. - Write descriptive texts for simple charts and tables.1. **Linguistic knowledge**
* **Pronunciation**: Vowel and consonant syllable, words with different syllables, Words with stress (specials cases) – Words without stress, Sentence stress, comprehension (assimilation), linking vowels with question vowels, intonation, homophones, practice words and terms, phrases, and sentences related to the students’ specialization.
* **Vocabulary**: Words related to themes and topics of the course, collocations, words with different meanings and pronunciations.
* **Grammar**: parts of speech, past, present, and future tenses, word structure (i.e., compound nouns), countable and uncountable nouns. Types on sentences: simple, compound, complex sentences, articles, linguistic function: commands, requests, offers, advice and instructions. Modal verbs, relative pronouns and relative clauses with which-that-who-whom-whose-where-when. Prepositions, Phrasal verbs including verbs, adverbs and prepositions, comparison showing changing things, sentences of reason and results and conjunctions: although, however etc, active and passive, adverbial clauses of condition, comparatives and superlatives of adjectives.
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| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | **Students are taught through Communicative language teaching (CLT)** in which students are encouraged to communicate with each other in the target language. Students need to be as familiar with the target language as possible in order to understand and use it in real-life situations. A variety of ways are also utilized to teach students technical English language in the field of chemical engineering. For example, work in group, practicing various activities, discussion, and presentation to make students communicate with each other in the target language and practice using the target language to communicate.  Students need to be confident in their ability to use the target language and to develop better interpersonal skills. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 33 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 2 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 17 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 1.1 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 50 |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10 % (5) | 5, 10 | LO #1, 2,  |
| **Assignments** | 2 | 10 % (5) | All weeks | LO # 3, 4, 6 and 7 |
| Oral evaluation  | 1 | 10% (10) | 7 | All |
| Written& spoken evaluation  | continuous | 10% (10) | All | All  |
| **Summative assessment** | **Midterm Exam** | 1.5 hr | 10% (10) | 14 | LO # 1-5 |
| **Final Exam** | 3hr | 50 % (50) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | **Parts of Speech** (nouns – verbs – adjectives – adverbs – prepositions – articles - pronouns-conjunctions - interjections) |
| **Week 2** | The components, structure and kinds of the sentences1. Simple - compound - complex
2. Declarative - interrogative - exclamatory - imperative
 |
| **Week 3** | Tenses - present tenses, definite and indefinite articles, ways of joining sentences  |
| **Week 4** | Tenses – past tenses, reading comprehension |
| **Week 5** | Tenses- future tenses, writing basics and strategies.  |
| **Week 6** | Passive and active sentence in scientific writing. |
| **Week 7** | Listening skills - how to participate in different topics - how to avoid silence,how to answer the questions of the passage in exam (i.e., WH Questions) |
| **Week 8** | Writing skills (punctuation - ways to join sentences - principles of paragraph structure - practice writing) |
| **Week 9** | Listening and speaking skills (multiple native conversations, especially in the technical language of chemical engineering). |
| **Week 10** | Idioms and idiomatic expression  |
| **Week 11** | Reading skills (skimming, scanning, and intensive reading)  |
| **Week 12** | Phrasal verbs, speaking skills (participating in a dialogue and turn taking)  |
| **Week 13** | Translation (from English to Arabic and vice versa)  |
| **Week 14** | Comparison and modals, participating in group discussion and be active listener/speaker  |
| **Week 15** | Writing skills (CV, cover letter, and email writing and related technical language used by chemical engineer)  |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | 1. New Headway, English Course, (beginner, pre-intermediate level), John and Liz Soars and Mike Sayer, Oxford University Press.
2. Selected ESP materials.
3. The language of chemical engineering in English, Roy V. Hughson, Regents publishing company, Inc.- New headway plus (English Course), Liz &amp; John Soars (2014), Oxford University press.
 | Yes |
| **Recommended Texts** | Grammar in Use and Rapid Review of Grammar.  | No |
| **Websites** | [Randall's ESL Cyber Listening Lab - English Listening](https://www.esl-lab.com/) |

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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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | General Mathematics | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Tutorial**
 |
| **Module Code** | GEMA111 |
| **ECTS Credits**  | 7 |
| **SWL (hr/sem)** | 175 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CES.OP |  **College** |  CES |
| **Module Leader** | Dr. Wallaa A. Noori |  **e-mail** |  wallaa.a.noori@[uotechnology.edu.iq](https://en.uobaghdad.edu.iq/) |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Ph.D. |
| **Module Tutor** | None |  **e-mail** | None |
| **Peer Reviewer Name** | Prof. Dr. Jamal M. Ali |  **e-mail** | Jamal.m.ali@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **Semester** |  |
| **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. To develop an understanding with the concepts of calculus and analytic geometry and the applications of these concepts to the solution of engineering problems.
2. Introduction to functions, limits, derivatives and their applications.
3. Provide practice at developing critical thinking skills, solving open ended problems and to work in teams.
 |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. Develop a deep understanding of issues related to the basic principles of calculus, and how to solve problems in chemical engineering.
2. The ability to understand and analysis problems related to specific field.
3. Understanding the necessary of all subject of mathematics in other sciences .
4. Understanding the necessary of derivatives and its application in other sciences.
5. An ability to apply effective, creative and innovative solutions, both independently and cooperatively, to current and future problems.
6. Characterization and analyses the performance of any problems in any object of chemical engineering.
 |
| **Indicative Contents****المحتويات الإرشادية** | Indicative content includes the following.PreliminariesReal numbers, Interval, Absolute value, Cartesian coordinates in the plane, Domain and range, Even & odd functions, Sum, differences, products & quotients, Composite functions, shifting a graph of a function, Scaling & reflecting a graph of a function. [6 hrs] Limits and Continuity Limits, Finite limits, Horizontal asymptotes, Vertical asymptotes, Continuity. [6 hrs]Transcendental functionsNatural logarithms functions, Exponential functions, Logarithms functions, ax functions, Trigonometric functions , Inverse trigonometric functions , Hyperbolic functions, Inverse hyperbolic functions. [9 hrs]Tangents & DerivativesFinding a tangent to the graph of a function, Differentiation, Differentiation rules, Second & higher-order derivatives , The derivative as a rate of change , Derivatives of trigonometric functions , The chain rule & parametric equations , The chain rule with powers of a function , Slopes of parameterized curves , Implicit differentiation , Related rates , L' Hopital's rule. [15 hrs]DeterminatesProperties of determinates, Cramer 's rule [3 hrs]Vector analysisComponent form, Vector algebra operations, Unit vectors, Midpoint of a line segment , Vector tangent & normal to the curve , The dot product , Angle between vectors , Perpendicular (orthogonal) vectors , Dot product properties & vector projections , The cross product [6 hrs] |
| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | 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 and tutorials. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 63 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 4 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 112 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 8 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 175 |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 3 | 15% (5) | 4,8,12 | LO #2, 3, 4 and 5 |
| **Assignments**  | 6 | 20%  | Continuous |  |
| **Report** | 1 | 5% (5) | 14 | LO # 1 and 6 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 10 | LO # 2, 3, 4 and 5 |
| **Final Exam** | 2hr | 50% (60) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Real numbers, Interval, Absolute value, Cartesian coordinates in the plane, Domain and range  |
| **Week 2** | Even & odd functions, Sum, differences, products & quotients, Composite functions , Shifting a graph of a function , Scaling & reflecting a graph of a function |
| **Week 3** | Limits, Finite limits |
| **Week 4** | Horizontal asymptotes, Vertical asymptotes , Continuity |
| **Week 5** | Natural logarithms functions, Exponential functions, Logarithms functions , ax functions |
| **Week 6** | Trigonometric functions, Inverse trigonometric functions |
| **Week 7** | Hyperbolic functions, Inverse hyperbolic functions |
| **Week 8** | Finding a tangent to the graph of a function |
| **Week 9** | Differentiation , Differentiation rules , Second & higher-order derivatives |
| **Week 10** | The derivative as a rate of change , Derivatives of trigonometric functions |
| **Week 11** | The chain rule & parametric equations , The chain rule with powers of a function , Slopes of parameterized curves |
| **Week 12** | Implicit differentiation , Related rates , L' Hopital's rule |
| **Week 13** | Properties of determinates , Cramer 's rule |
| **Week 14** | Component form , Vector algebra operations , Unit vectors , Midpoint of a line segment , Vector tangent & normal to the curve |
| **Week 15** | The dot product , Angle between vectors , Perpendicular (orthogonal) vectors , Dot product properties & vector projections , The cross product |
| **Week 16** | Final Exam |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | "Thomas' Calculus Early Transcendentals", George B.Thomas, Jr. , Twelfth Edition, Addison-Wesley, 2010 | Yes |
| **Recommended Texts** | “Mathematical Methods in Chemical Engineering”, Jenson. V.J. and Jeffereys, G.V, 2nd Edition, Academic Press New York, 1977 | Yes |
| **Websites** |  |

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
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| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Analytical Chemistry  | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Tutorial**
* **Lab**
 |
| **Module Code** | ANCH112 |
| **ECTS Credits**  | 7 |
| **SWL (hr/sem)** | 175 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CES.OP |  **College** |  CES |
| **Module Leader** | Lec. ALYAA ESAM |  **e-mail** | Alyaa.E.Mahdi*@*uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | M.s.c |
| **Module Tutor** | None |  **e-mail** | None |
| **Peer Reviewer Name** | Ass.prof. May Ali AL Saffar |  **e-mail** | may.a.Muslim@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **Semester** |  |
| **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-Preparing applied engineers in the field of sciences who are distinguished by ahigh level of knowledge and technological creativity, and develop problem solving skills by knowing important Laws of Chemistry.2. Enable the student to know and understand calculation and methods of preparing solutions needed in many field.3. Enable the student to understand theoretical principles in handicrafts and measurements. |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. To recognize how to calculate molecular weight by different methods.
2. The principle of preparing standard solutions which is very important every time and place to chemical engineering student in every stage.
3. Studying instrumental analysis method to know how devices works (mechanism and calculation.
4. The student acquires basic engineering skills such as Electrical and spectral in addition to traditional methods of analytical chemistry installations that serve him in the professional field.

5- Enabling the student to use labs tools and devices in chemistry laboratory. |
| **Indicative Contents****المحتويات الإرشادية** | 1. Introducing the student to the basics of calculation of Analytical Laws, and methods of measurement and standardization
2. Introducing the student to use different types of laboratory tools
3. Introducing students to deal with Chemicals
4. Introducing the student to the basics of keeping safe in the lab
5. Introducing the student to the basics of the art of solving exercises
6. Introducing the student to accept the experience in theoretical and practical subject through

Four years of study . |
| **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, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 112 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 4 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 63 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 8 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 175 |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10 | 4.9,15 | 1,2,3,4 |
| **Assignment**  | 2 | 10 | 3,7,11,13 | 1,2,3,4 |
| **Report** | 1 | 10 | 12 | 4 |
| **Lab** | 15 | 10 | Continuous  | 5 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 10 | LO ALL |
| **Final Exam** | 3hrs | 60 | 16 | all |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Introduction of Atom-theories of discovering atom. Experiments of Scientist. -Defects of some theories and solutions. |
| **Week 2** | Introduction of Analytical Chemistry-branches of analytical chemistry (Definition and classification) -methods of calculation for every branch of analytical chemistry. |
| **Week 3** | Molecular weight calculation for atom and molecules.-oxidation states for ions and valence numbers for acids and bases. -Mole fraction, weight fraction. volume fraction. -solving examples and giving homework. |
| **Week 4** | Molarity, Normality, Law and Calculation, Examples and HomeWorks |
| **Week 5** | Strong and weak acid and base (scientist definitions).-PH for strong acid and base. -PH for weak acid and base. -Written exam in practical exercises. (quiz) |
| **Week 6** | Blacksmith Workshop-An exercise forming the number five in English. - Exercise forming the number nine in English. -An exercise in forming an iron model in the form of a circle. |
| **Week 7** | Blacksmith WorkshopS-shape exercise. Air hammer hot barbell exercise. Exercise to form a circle on an electric bending machine. Exercising cold and hot ornament formation. A written exam in practical exercises |
| **Week 8** | -PH for weak acid and its salt. PH for weak base and its salt. -solving exercise.Calculation of PH for common ion. -Solving exercise and homework. |
| **Week 9** | Chemical Equilibrium-calculation the rate of chemical equilibrium reaction -factors affecting on Chemical Equilibrium. -solving examples and homework |
| **Week 10** | Spectroscopic Analysis.-Introduction about Spectroscopy. -Methods of spectroscopic Analysis:-Ultra Violet (UV), Infra-Red (IR) Spectroscopy. -Wave length, preparing the sample |
| **Week 11** | Atomic Absorption Spectroscopy (AAS)-PH Meter. -Chromatography -Wave length, preparing the sample . |
| **Week 12** | Environmental Chemistry ----- Water Chemistry-Fresh water. Hydrological cycle. Waste water. -Water pollutant: chemical water pollutant.-Characterization of waste water |
| **Week 13** | Air Pollution* Air pollutant: primary pollutant, secondary pollutant

Photo chemical smog. -Formation and Depletion of Ozone in the Stratosphere. |
| **Week 14** | Soil Pollution-Domestic and Municipal wastes. -Industrial and Mining wastes. -Agricultural wastes.-Radioactive Materials. -Biological Agents. |
| **Week 15** | Third Exam. |
| **Week 16** | Final Exam |

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| **Delivery Plan (Weekly Lab. Syllabus)****المنهاج الاسبوعي للمختبر** |
|  | **Material Covered** |
| **Week 1** | Lab 1 Introduction to Techniques Experiment use of pipetmen: |
| **Week 2** | Lab 2: Specific identification of Suger-1 |
| **Week 3** | Lab 3:Spesific identification of Sugar II |
| **Week 4** | Lab 4:Specific identification of lipid I |
| **Week 5** | Lab 5: Specific identification of lipid II |
| **Week 6** | Lab 6: Specific identification of Amino acid |
| **Week 7** | Lab 7: Specific identification of Protein |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Lininger A.l Nelson | Yes |
| **Recommended Texts** | Weiner, R,F,Environmental engineering 4th ed,.Clinical chemistry I D.Ali Altemimi | Yes |
| **Websites** |  |

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
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| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department | **University of Technology - Iraq** |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | PHYSIS & STRENGTH OF Materials | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Tutorial**
* **Seminar**
 |
| **Module Code** | PHST113 |
| **ECTS Credits**  | 7 |
| **SWL (hr/sem)** | 175 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CES.OP |  **College** |  CES |
| **Module Leader** | Dr. Qusay Al-Obaidi |  **e-mail** |  Qusay.J.AlObaidi@uotechnology.edu.iq  |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Ph.D. |
| **Module Tutor** | None |  **e-mail** | None |
| **Peer Reviewer Name** |  Dr. Asawer A. Alwasiti |  **e-mail** | Asawer.A.Alwasiti@uotechnology.edu.iq |
| **Review Committee Approval** | 08/ 06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | Secondary School | **Semester** |  |
| **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. Determine the components of linear motion (displacement, velocity, and acceleration).2. Solve problems involving forces and work.3. Apply Newton's laws to physical problems.4. Identify the different types of energy.5. Solve problems using principles of conservation of energy.6. Define the principles of momentum and collisions.7. This class is designed to study the effects of external forces on a group of solid objects.8. This class is designed to study the resistance of materials and their applications in chemical engineering |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. Students will demonstrate basic understanding of basics and definitions of physics.
2. The student should be able to describe the motions of objects using generalized coordinates, power, forces and energy.
3. To familiarize the students with basic concepts of the thermodynamics and their applications in engineering problems
4. The student should be able to apply the Newtonian laws using various mathematical formulations
5. The student should be able to identify the mathematical quantities which effect the momentum and be able to calculate momentum from mass and velocity.
6. A student should be able to appreciate that physics is relevant to the real world and is a useful tool for solving problems
7. The student should be able to identify the resistance of materials and their applications in chemical engineering
 |
| **Indicative Contents****المحتويات الإرشادية** | Indicative content includes the following.Motion in one Dimension: • Position• Displacement• Velocity• Acceleration• Derivation: creating new equations• Motion equations for constant acceleration• Free-fall acceleration (3hr)Work, Energy, and Power: • Energy• Kinetic energy• Work-kinetic energy theorem• Power• potential energy• Work and gravitational potential energy• Conservation of energy (3hr)Thermodynamics and Thermal Stress: • Temperature and Heat• Temperature and thermometers• Temperature scales• Temperature scale conversions• Heat• Zeroth law of thermodynamics• Internal energy • Thermal expansion and its types• Specific capacity• Phase changes• Latent heat• Modes of heat transfer• Global warming and the greenhouse effect (5hr) Force and Newton's Laws:Surface Tension, Viscosity. Newton's first law• Gravitational force: weight• Newton's second law• Newton's third law• Normal force• Tension• Newton's second and third laws (5hr)Momentum: • Linear momentum• Conservation of momentum• CollisionsForce Vectors and Force System Resultants (4hr)Properties of matter Equilibrium of Rigid Bodies :Moment of a Force: Introduction Force in Rigid Bodies: Poisson Ratio, Composite Stresses: (30hr)Modern Physics (5hr)Chemical Effect of Electricity: (4hr) |
| **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, interactive tutorials and by considering type of simple problems and design involving activities that are interesting to the students. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 79 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 5 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 97 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 6.4 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 175 |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 3 | 15% (5) | 3,8  | 1, 3,6 |
| **Assignments** | 6 | 20% (20) |  5 | 1,3, |
| **Seminar**  | 1 | 5% (10) |  13 | 1-7 |
| **Summative assessment** | **Midterm Exam** | 1 hr/2 | 10% (10) |  4,10 | 1-5 |
| **Final Exam** | 3hr/1 | 50% (50) | 16 | 1-7 |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Motion in one Dimension: • Position• Displacement• Velocity• Acceleration• Derivation: creating new equations• Motion equations for constant acceleration• Free-fall acceleration |
| **Week 2** | Work, Energy, and Power: • Energy• Kinetic energy• Work-kinetic energy theorem• Power• potential energy• Work and gravitational potential energy• Conservation of energy |
| **Week 3** | Thermodynamics and Thermal Stress: • Temperature and Heat• Temperature and thermometers• Temperature scales• Temperature scale conversions• Heat• Zeroth law of thermodynamics• Internal energy • Thermal expansion and its types• Specific capacity• Phase changes• Latent heat• Modes of heat transfer• Global warming and the greenhouse effect |
| **Week 4** | Force and Newton's Laws:Surface Tension, Viscosity. Newton's first law• Gravitational force: weight• Newton's second law• Newton's third law• Normal force• Tension• Newton's second and third laws |
| **Week 5** | Momentum: • Linear momentum• Conservation of momentum• CollisionsForce Vectors and Force System Resultants  |
| **Week 6** | Equilibrium of Rigid Bodies |
| **Week 7** | Moment of a Force: Moment about a point, Resultant moment of multiple forces, Moment of Couple |
| **Week 8** | Friction and Friction on an Inclined Plane |
| **Week 9** | Internal Forces and Centroid & Center of Gravity |
| **Week 10** | Introduction Force in Rigid Bodies:Definitions of Stress and Strain, Stress-Strain DiagramsElastic limit, Stiffness elasticity, Plasticity, Hardness and working stress. |
| **Week 11** | Hooke's law and spring force• Air resistance • Free body diagram• Static and kinetic friction |
| **Week 12** | Poisson Ratio, Composite Stresses:Volumetric Stress, Bulk Modulus, Thin-Walled CylindersShear and Bending Moments in Beam |
| **Week 13** | Modern Physics: Electron, thermionic, emission, photoelectric emission,• X-ray• The nucleus• Structure of nucleus and atom• Radioactivity• Nuclear energy• Ionizing radiation• Health hazards |
| **Week 14** | Introduction to IS units and DC circuit:Materialuseinelectriccomponent,ohmslaw,temperatureCoefficient,Review of Kirchhoff's Laws, Series and Parallel circuit, Resistance and resistivityElectrolysis, Electroplating, Electrical Cells |
| **Week 15** | **Preparatory Week** |
| **Week 16** | **Final Exam** |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | 1 Shipman, James, Jerry D. Wilson, Charles A. Higgins, and Bo Lou. An introduction tophysical science. Cengage Learning, 2013.**2.** Principle of Physics, Kinetic Books Company, 2007 | yes |
| **Recommended Texts** | Principles of physics Kinetic book (1-877-4kbooks)Engineering Physics I&IIEngineering mechanics by FerdinandEngineering mechanics by R.C. Hibbeler | no |

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
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| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Computer Science | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Lab**
 |
| **Module Code** | COSC108 |
| **ECTS Credits**  | 3 |
| **SWL (hr/sem)** | 75 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CES.OP | **College** | CES |
| **Module Leader** | Gaidaa Saeed Mahdi | **e-mail** | gaidaa.s.mahdi@uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Master |
| **Module Tutor** | None | **e-mail** | None |
| **Peer Reviewer Name** | Mahir Aziz Abdulrahman | **e-mail** | Mahir.A.AbdulRahman@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **Semester** |  |
| **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- Learn the basics of computer and operation system Windows 7 and application program Office 2010 and programming language (Visual Basic) and used to solve the problems of chemical engineering.2- emphasizes the general principles and techniques of computer programming, which can be applied to almost any programming language. Although the emphasis is on programming in any language, this course focuses on one language, in particular, called Visual Basic. It provides the students with a basic understanding and appreciation of the various essential programming-languages constructs, programming paradigms, evaluation criteria and language implementation issues.3- develop the mathematical skills necessary to solve practical problems4- Equip you with the knowledge and skills for a range of careers in technology and computer-based industry5 developing critical thinking skills, solving open-ended problems and working in teams.- |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1-Be able to operate computer hardware and peripherals, Overview of computer systems-hardware and operating systems. Be familiar with software applications, understand file management and have skills in developing simple scientific and educational programs2- skills in using Microsoft software; and accomplishing creating essential documents, worksheets and databases. 3- Demonstrate knowledge and understanding of the core ideas of programming languages.4- Analyze a problem, and identify and define the computing requirements appropriate to its solution.5- Apply algorithmic principles and computer science to design problem solutions.6- Understand and apply various programming principles to solve problems in different areas.7- Demonstrate knowledge and understanding of the core ideas of programming languages.7- Analyze a problem, and identify and define the computing requirements appropriate to its solution.8- Apply algorithmic principles, and computer science to design problem solutions.9- Understand and apply various programming principles to solve problems in different areas. |
| **Indicative Contents****المحتويات الإرشادية** | * Microsoft Windows 7(1 hr.)
* Microsoft Word (1 hr.)
* Microsoft Excel(1 hr.)
* Introduction To Visual Basic Programming

**•** Menu bar • Tools bar • Project explorer • Tool box • Properties windows • Form • Code• Controls: Command Buttons, Labels, Textbox, Pointers, Picture box, frame. • Naming Controls. • Properties for controls: Height, Width, Left, Top, Font, Forecolor, Backcolor, Name, Caption, Text, and Visible.(1 hr.)* Events. • Saving Visual Basic Project.

• Examples: Chemical Engineering Applications.(1 hr.)* Built-In Functions

Built-in math functions: • Abs(x), Int(x), Rnd(x), sgn(x), sqr(x), str(x), val(x), round(x, n), CInt(x), Fix(x). • String Functions .(1 hr.)* Selection Structure:Single Selection: If/Then structure.• Double Selection: If/Then/Else structure.• Nested If/Then/Else structure.• Select Case Multiple Selection Structure. • Examples: Chemical Engineering Applications. .(2 hr.)
* • InputBox.• MsgBox. • Examples: Chemical Engineering Applications**.** .(2 hr.)
* Repetition Structure:• For ... Next Loop.• While ... Wend • Do .... While ... Loop • Do ... Loop Until • Exit Do, Exit For, Examples: Chemical Engineering Applications. (2hr.)
* Variable • Data Types: Boolean, Integer, Long, Single, Double, String.

• Valid Naming of Variables, • Initial Value for each Type of the Variables (Initial Value for each Data Type). • Size of each Variable Type in Bytes. • How to Declare Variables. (Dim statement). • Using: Dim variable-name As Data type. • Using Suffix: Integer, Long, Single, Double, String• Constant Variable. • Examples: Chemical Engineering Applications. .(1 hr.)* ARRAYS:• Introduction: Defining Arrays • Array Declaration Statement • Assigning Values for Arrays (i.e. filling array's element value either by the loop or by direct assignment statement). • ReDim Statement.

• Using Loops with Arrays. (i.e. writing an application on an array using loops)• Two Dimensional Arrays. • Operations on Arrays: • Fill Array Elements with Random Numbers using Rnd Function.• Sorting.• Searching. (i.e. Linear search).• Swapping Two Elements. .(1 hr.)* Graphics In Visual Basic• Graphics control• Picture box• Image box

• Coordinate system• Pixel• Graphics methods (Line, Circle, pset)• Examples: Chemical Engineering Applications.(1 hr.) |
| **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, interactive tutorials and by considering the 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** | 48 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 3 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 27 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 1.8 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 75 |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 3 | 15% (5) | 3-11 | LO #3, 4, 5,6,7 and 8 |
| **Assignments** | 2 | 10% (5) | 2-13 | LO # 1-9 |
| **Projects / Lab.** | 1 | 10% (10) | Continuous |  |
| **Report** | 1 | 5% (5) | 13 | LO # 1-9 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 5-14 | LO # 1-9 |
| **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Windows7 |
| **Week 2** | Micro soft word |
| **Week 3** | Micro soft excel |
| **Week 4** | Introduction To Visual Basic Programming |
| **Week 5** | Other toolbox items |
| **Week 6** | Mathematic functions |
| **Week 7** | Conditional sentence |
| **Week 8** | InputBox function and message box function |
| **Week 9** | Iteration loops |
| **Week 10** | Data and variable |
| **Week 11** | Array |
| **Week 12** | Menu bar |
| **Week 13** | graphics |
| **Week 14** | Review |
| **Week 15** | **Preparatory Week** |
| **Week 16** | **Final Exam** |

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| **Delivery Plan (Weekly Lab. Syllabus)****المنهاج الاسبوعي للمختبر** |
| **Week**  | **Material Covered** |
| **Week 1** | Lab 1:windows7,Microsoft Word, Microsoft Excel |
| **Week 2** | Lab 2: Introduction To Visual Basic Programming,writing code |
| **Week 3** | Lab 3: Mathematic functions |
| **Week 4** | Lab 4: Conditional sentence |
| **Week 5** | Lab 5: InputBox function and message box function |
| **Week 6** | Lab 6: Iteration loops |
| **Week 7** | Lab 7: Data and variable,array, the menu bar |
| **Week 8** | Lab 8:graphics |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | 1. Microsoft® Making the Transition to Microsoft Windows 7 – Just the Basics! © 2009 CustomGuide, Inc. / Bates College (October 2011)
2. Windows® 7 Step by Step by Joan Preppernau and Joyce Cox ©2009 Joan Preppernau and Joyce Cox, Early Content—Subject to Change, Microsoft Press.
3. Step by Step, Microsoft Office Word 2007, Published by Microsoft Press A Division of Microsoft Corporation, One Microsoft Way Redmond, Washington 98052-6399, Copyright © 2007 by Joyce Cox, Joan Preppernau, and Online Training Solutions, Inc.
4. Microsoft Office Word 2007 By: Torben Lage Frandsen & Ventus Publishing Aps, The eBookboon, The eBook company,2010
5. BEGINNING EXCEL, Barbara Lave, Diane Shingledecker, Julie Romey, Noreen Brown, & Mary Schatz, Portland Community College, 2021,Libretext:

[https://workforce.libretexts.org/@go/page/14525](https://workforce.libretexts.org/%40go/page/14525)1. Introduction: Visual Basic Basic 6.0, By: Gary Haggard, Wade Hutchison, Christy Shibata,1st edition, 2013, bookboon.com
2. Programming Microsoft Visual Basic 6.0, PUBLISHED BY:Microsoft Press, A Division of Microsoft Corporation,One Microsoft Way Redmond, Washington 98052-6399, 1999 by Francesco Balena
 | no |
| **Recommended Texts** |  | No |
| **Websites** |  |

**APPENDIX:**

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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 | **مقبول بقرار** | (45-49) | More work is required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | A considerable amount of work required |
|  |  |  |  |  |
| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of BaghdadCollege of EngineeringDepartment of Electrical Engineering |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | * Human Rights and democracy
 | **Module Delivery** |
| **Module Type** | * Suplement
 | * **Theory**
* **Lecture**
* **Seminar**
 |
| **Module Code** | * HURD125
 |
| **ECTS Credits**  | * 2
 |
| **SWL (hr/sem)** | * 50
 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CES.OP | **College** | CES |
| **Module Leader** | Dr.Bushra Abdullah  | **e-mail** | Bushra.a.mchyet@uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Assistant Professor | **Module Leader’s Qualification** | Ph.D. |
| **Module Tutor** |  | **e-mail** | None |
| **Peer Reviewer Name** | Dr.mahmood obied | **e-mail** | Mahmood.o.mohmmed@uotechnology.edu.iq |
| **Review Committee Approval** | 15/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **Semester** |  |
| **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-Define the concept of human rights democracy and their characteristics2-To promote the culture of human rights and democracy in society |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1.تزويد الطلبة بالمعرفه العامه عن حقوق الانسان والانضمه السياسية 2.تطوير قدرات الطالب المعرفية وتنمية اهتمامه في مجالات حقوق الامسان.3.تسليح الطلبه بالمعلومات العامه عن الانضمة السياسيه ووسائل استقرارها ونجاحها4.تسليح الطلبة بالافكار السوية التي تحميهم من الافكار المتطرفه وابعادهم غن الترويج لفكر معين.5.خلق جيل ذات سلوك سوي يتوافق مع السلوك الجامعي .6-نقل المسؤولية للطالب في قيادة المحاظرة مع التصحيح وتشخيص المعوقات . |
| **Indicative Contents****المحتويات الإرشادية** | 1.معرفه مفهوم حقوق الانسان واهم خصائصه2.معرفه فئات حقوق الانسان والاعلان العالمي لحقوق الانسان3-.معرفه حقوق الانسان في الاسلام ثم العلاقة بين حقوق الانسان والعولمه من خلال درا سة الاصالة والمعاصرة4.ارهاصات حقوق الانسان والفرق بين الثقافه السياسيه والايدلوجيه5 .معرفه ماهو النظام الديمقراطية وماهي اهم سماته والتطور التاريخي للنظام الديمقراطي6.الديمقراطيه المباشره وشبه المباشره والتمثيليه7.العالمية والخصوصيه للنضام الديمقراطي8.مساوء ومحاسن الديمقراطيه9.ادلجه الديمقراطية10.العلاقه بين الديمقراطية والتنمية11 معرفة النظام البرلماني والنظام الرئاسي  |
| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | 1.محاضرات نضريه مباشره2. استخدام طريقه العصف الذهني3 .تقارير علميه لكل طالب وباختيارهم4.سيمنر لمناقشه البحوث التي تقدم من قبل الطلبه5سؤال فكري ك.واجب بيتي6 - في النية استخدام الداته شو لعرض فلم عن حقوق الانسان من اجل استخلاص العبر والمضامين الانسانية.  |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 33 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 2 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 17 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 1.2 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 50 |

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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) | 5, 10 | LO #1,4 and 5 |
| **Assignments** | 2 | 5% (5) | 2, 12 | LO # 3, 4, 5 -and-6 |
|  |  |  |  |  |
| **Report** | 1 | 5% (5) | 13 | LO # 5 |
| **Summative assessment** | **Midterm Exam** | 1 | 10% (5) | 7 | LO # 1-4 |
| **Final Exam** | 1 | 70% (70) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Introduction to Human Rights and Human Rights and Secularism |
| **Week 2** | The concept of human rightsand Characteristics of human rights |
| **Week 3** | Human Rights Classification |
| **Week 4** | Human Rights in Ancient Civilizations and Human Rights and Islam |
| **Week 5** | Human rights sources |
| **Week 6** | Universal Declaration of Human Rights Human Rights and the Constitution of the Republic of Iraq 2005 |
| **Week 7** | Human rights and political partiesHuman Rights and Globalization |
| **Week 8** | Positions of the Arab intellectual currents of human rights and Human rights between universality and privacy |
| **Week 9** | The historical development of democracy and Forms of democracy |
| **Week 10** | Types of democratic systems |
| **Week 11** | Concept of Election  |
| **Week 12** | Challenges to democratization |
| **Week 13** | Democracy between universality and privacy |
| **Week 14** | Democracy and development |
| **Week 15** |  The pros and cons of democracy |
| **Week 16** | **Final Exam** |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | * 1. عبد الكريم خليفة، القانون الدولي لحقوق الإنسان، بدون طبعة )الإسكند رية: دار الجامعة الجديدة، 2013
	2. مبادئ و قواعد عامة في حقوق الأنسان ,د. صلاح حسن مطرود
 | Yes |
| **Recommended Texts** | * 1. محمد علي الشجيري , حقوق الأنسان بين الأسلامي و العالمي
	2. . زكريا أبراهيم , مشكلة الحرية
 | No |
| **Websites** | * 1. ماهر صلاح الجبوري , حقوق الأنسان و الديمقراطية
	2. مجموعة باحثين، مشاكل تطبيق الديمقراطية في العالم العربي
	3. رياض هاشم، اسس الديمقراطية وقواعدها
	4. محمد عابد، الديمقراطية وحقوق الانسان
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**APPENDIX:**

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
|  |  |  |  |  |
| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Differentiation and Integration | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Tutorial**
 |
| **Module Code** | DIIN121 |
| **ECTS Credits**  | 6 |
| **SWL (hr/sem)** | 150 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 2 |
| **Administering Department** | CES.OP |  **College** | CES |
| **Module Leader** | Dr. Wallaa A. Noori |  **e-mail** |  wallaa.a.noori@[uotechnology.edu.iq](https://en.uobaghdad.edu.iq/) |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Ph.D. |
| **Module Tutor** | None |  **e-mail** | None |
| **Peer Reviewer Name** | Prof..Dr. Jamal M. Ali |  **e-mail** | Jamal.m.ali@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | GEMA112 | **Semester** | 1 |
| **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. To develop an understanding with the concepts of calculus and analytic geometry and the applications of these concepts to the solution of engineering problems.
2. Introduction to functions, limits, derivatives and their applications.
3. Provide practice at developing critical thinking skills, solving open ended problems and to work in teams.
 |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. Develop a deep understanding of issues related to the basic principles of calculus, and how to solve problems in chemical engineering.
2. The ability to understand and analysis problems related to specific field.
3. Understanding the necessary of all subject of mathematics in other sciences .
4. Understanding the necessary of integration and its application in other sciences .
5. An ability to apply effective, creative and innovative solutions, both independently and cooperatively, to current and future problems.
6. Characterization and analyses the performance of any problems in any object of chemical engineering.
 |
| **Indicative Contents****المحتويات الإرشادية** | Indicative content includes the following.**Integration**Indefinite integrals , Rules for indefinite integrals , Integration by substitution , Definite integrals , Rules for definite integrals , Mean (average) value , One-to-one functions , Inverse functions , Derivatives of inverse of differentiable functions ,The derivative & integral of natural logarithms functions, Exponential functions, Logarithms functions, ax functions, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, & Inverse hyperbolic functions. [12 hrs]Techniques of integrationIntegration by parts , Integration of rational functions by partial fractions , Trigonometric integrals , Trigonometric substitutions , Integration of rational functions of sine & cosine. [9 hrs] Applications of definite integrals  Area between the graph & the x-axis , Area between curves , Volume by slicing & rotation about an axis , The disk method , The washer method , The shell method , Length of plane curves , Length of a parametric curves , Length of curve y=f(x) , Length of curve x=g(y) , Area of surfaces of revolution , Surface area for revolution about the x-axis , Surface area for revolution about the y-axis , Surface area of revolution for parameterized curves. [12 hrs]Partial derivatives Partial derivatives with respect to x , Partial derivatives with respect to y , Functions of more than two variables , Second order partial derivatives , The mixed derivative theorem , partial derivatives of still higher order , The chain rule , Implicit differentiation. [6 hrs]Polar coordinatesDefinition , Polar equation & graphs , Relating polar & Cartesian coordinates , Polar equation , Graphing in polar coordinates. [6 hrs] |
| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | 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 and tutorials. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 48 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 3 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 102 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 6.8 |
| **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) | 4,8,12 | LO #2, 3, 4 and 5 |
| **Discussion** | 1 | 5% (5) | Continuous |  |
| **Report** | 1 | 5% (5) | 14 | LO # 1 and 6 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 10 | LO # 2, 3, 4 and 5 |
| **Final Exam** | 2hr | 70% (70) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Indefinite integrals , Rules for indefinite integrals , Integration by substitution |
| **Week 2** | Definite integrals , Rules for definite integrals , Mean (average) value , One-to-one functions , Inverse functions , Derivatives of inverse of differentiable functions |
| **Week 3** | The derivative & integral of natural logarithms functions, exponential functions, logarithms functions, & ax functions |
| **Week 4** | The derivative & integral of trigonometric functions, inverse trigonometric functions , hyperbolic functions, & inverse hyperbolic functions |
| **Week 5** |  Integration by parts |
| **Week 6** | Integration of rational functions by partial fractions |
| **Week 7** | Trigonometric integrals , trigonometric substitutions , integration of rational functions of sine & cosine |
| **Week 8** |  Area between the graph & the x-axis , area between curves |
| **Week 9** | Volume by slicing & rotation about an axis , the disk method , the washer method , the shell method |
| **Week 10** | Length of plane curves , length of a parametric curves , length of curve y=f(x) , length of curve x=g(y) |
| **Week 11** | Area of surfaces of revolution , surface area for revolution about the x-axis , surface area for revolution about the y-axis , surface area of revolution for parameterized curves |
| **Week 12** | Partial derivatives with respect to x , partial derivatives with respect to y , functions of more than two variables , second order partial derivatives |
| **Week 13** | The mixed derivative theorem , partial derivatives of still higher order , the chain rule , implicit differentiation |
| **Week 14** | Definition , polar equation & graphs , relating polar & cartesian coordinates , polar equation  |
| **Week 15** | Graphing in polar coordinates |
| **Week 16** | Final Exam |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | "Thomas' Calculus Early Transcendentals", George B.Thomas, Jr. , Twelfth Edition, Addison-Wesley, 2010 | Yes |
| **Recommended Texts** | “Mathematical Methods in Chemical Engineering”, Jenson. V.J. and Jeffereys, G.V, 2nd Edition, Academic Press New York, 1977 | Yes |
| **Websites** |  |

**APPENDIX:**

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
|  |  |  |  |  |
| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department | University of Technology - Chemical Engineering: Statistics ... |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Chemical Engineering Principles I | **Module Delivery** |
| **Module Type** | Core | * **Theory**
* **Lecture**
* **Tutorial**
* **Seminar**
 |
| **Module Code** | CHES.P.131 |
| **ECTS Credits**  | 6 |
| **SWL (hr/sem)** | 63 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 2 |
| **Administering Department** | CES.OP | **College** | CES  |
| **Module Leader** | Dr. Khalid T. Rashid | **e-mail** | Khalid.T.Rashid@uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Professor | **Module Leader’s Qualification** | Ph.D. |
| **Module Tutor** | None | **e-mail** | None |
| **Peer Reviewer Name** | Dr. Qusay Al-Salhy | **e-mail** | qusay.f.abdulhameed@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | ANCH113 | **Semester** | 1 |
| **Co-requisites module** | DIIN121  | **Semester** | 2 |
| **Module Aims, Learning Outcomes and Indicative Contents****أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** |
|  **Module Aims****أهداف المادة الدراسية** | 1. To understand how Dimensions, Units, Their Conversion and Dimensional Consistency (Homogeneity)
2. To understand how dealing with of Multicomponent Solutions and Mixtures
3. This course deals with the basic concept of material balance.
4. To understand how to solve material balance problems
 |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. Have a deep knowledge, wide scope and improved understanding of the mechanisms in mass balance as well as a better insight into analytical and empirical methods applied in analysis of material balance related problems.
2. Gain knowledge for applying the material balance in chemical engineering problems.
3. To provide experience for students to solve material balance for different process
4. To enhanced the student's ability to develop a strategy for the analyzing and resolving material balance problems
5. To be able to understand the principles and essentials of energy balancing and the relationship between the energy consumed and the generated energy
 |
| **Indicative Contents****المحتويات الإرشادية** | Indicative content includes the following.Part A -Dimensions, Units, And Their Conversion Dimensions Are Our Basic Concepts Of Measurement Such As Length, Time, Mass, Temperature, And So On; Units Are The Means Of Expressing The Dimensions, Such As Feet Or Centimeters For Length, And Hours Or Seconds Or Time., Operations With Units, Conversion Of Units And Conversion Factors [10 hrs]Introduction to Moles, Density and Concentration, Mole Fraction and Mass (Weight) fraction: Theprocedureforconvertingonesetofunitstoanotherissimplytomultiplyanynumberandits associated units by ratios termed conversion factors to arrive at the desired answer and its associated units. Analyses of Multicomponent Solutions and Mixtures: The composition of gases will always be assumed to be given in mole percent or fraction unless specifically stated otherwise.The composition of liquids and solids will be given by mass (weight) percent or fraction unless otherwise specifically stated.[8 hrs]Choosing a Basis: A basis is a reference chosen by you for the calculations you plan to make in any particular problem, and a proper choice of basis frequently makes the problem much easier to solve.The basis may be a period of time such as hours, or a given mass of material, such as 5 kg of CO2, or some other convenient quantity. [8 hrs]Temperature: Temperature is a measure of the energy (mostly kinetic) of the molecules in a system. This definition tells us about the amount of energy. Other scientists prefer to say that Temperature is a property of the state of thermal equilibrium of the system with respect to other systems because temperature tells us about the capability of a system to transfer energy (as heat). [8 hrs]Revision problem classes [4 hrs]Part B - Introduction to Material Balances Fundamentals: The Concept of a Material Balance: A material balance is nothing more than the application of the law of the conservation of mass. [8 hrs]A General Strategy for Solving Material Balance Problems: Problem Solving: An orderly method of analyzing problems and presenting their solutions represents training in logical thinking that is of considerably greater value than mere knowledge of how to solve a particular type of problem. [4 hrs]Solving Material Balance Problems for Single Units without ReactionThe use of material balances in a process allows you (a) to calculate the values of the total flows and flows of species in the streams that enter and leave the plant equipment, and (b) to calculate the change of conditions inside the equipment. [10 hrs] |
| **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, interactive tutorials and by considering type of simple problems and design involving activities that are interesting to the students. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 63 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 4 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 87 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 5.8 |
| **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) | 5, 10 | LO #1, 2 and 3 |
| **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4 and 5 |
| **discussion** | 1 | 10% (10) | Continuous |  |
| **Report** | 1 | 10% (10) | 13 | LO # 4 and 5 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-5 |
| **Final Exam** | 2hr | 50% (50) | 15 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Introduction - Dimensions, Units, and Their Conversion |
| **Week 2** | Dimensional Consistency (Homogeneity) |
| **Week 3** | Operations with Units |
| **Week 4** | Introduction to Moles, Density and Concentration |
| **Week 5** | Mole Fraction and Mass (Weight) Fraction |
| **Week 6** | Analyses of Multicomponent Solutions and Mixtures  |
| **Week 7** | Choosing a Basis: A basis is a reference chosen by you for the calculations you plan to make in any particular  |
| **Week 8** | An introduction to temperatures and temperature concepts and their effect on other thermal properties |
| **Week 9** | Mid-term Exam |
| **Week 10** | Introduction to Material Balances, the Concept of a Material Balance |
| **Week 11** | Steady-State and Unsteady-State Systems |
| **Week 12** | General Strategy for Solving Material Balance Problems |
| **Week 13** | Degree of Freedom Analysis |
| **Week 14** | Solving Material Balance Problems for Single Units without Reaction |
| **Week 15** | **Preparatory Week** |
| **Week 16** | **Final Exam** |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | D.M.Himmelblau and J.B.Riggs ,Basic Principles and Calculations in Chemical Engineering ,8th Edition , 2012 . | Yes |
| **Recommended Texts** | R.M.Felder and R.W.Rousseau ,Elementary Principles of Chemical Processes ,3rd Edition ,2005 . | Yes |
| **Websites** | https://www.icheme.org/education/whynotchemeng/ |

**APPENDIX:**

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
|  |  |  |  |  |
| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Biochemistry | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Tutorial**
* **Lab**
 |
| **Module Code** | BICH123 |
| **ECTS Credits**  | 6 |
| **SWL (hr/sem)** | 150 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 2 |
| **Administering Department** | CES.OP |  **College** |  CES |
| **Module Leader** | Lec. ALYAA ESAM |  **e-mail** | Alyaa.E.Mahdi*@*uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | M.s.c |
| **Module Tutor** | None |  **e-mail** | None |
| **Peer Reviewer Name** | Ass.prof. May Ali AL Saffar |  **e-mail** | may.a.Muslim@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | ANCH112 | **Semester** | 1 |
| **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-Preparing applied engineers in the field of sciences who are distinguished by ahigh level of knowledge and technological creativity, and develop skills by knowing important of Biochemistry.2. Enable the student to know and understand basic chemical process in the cell as well as their Environmental effects. |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1- To recognize what are the main component of organism cell.2- Knowing the structure of Biomolecules and the joins between them3- studying the method of identification of biomolecules.4- Enable the student to use lab tools in order to characterize biomolecules by doing experiments5- Knowing more about green technology.6.knowing the functions of most components of the cell |
| **Indicative Contents****المحتويات الإرشادية** | 1. Introducing the student to the basics of Biomolecules structure2. Introducing the student to use different types of laboratory tools3. Introducing students to deal with Chemicals4. Introducing the student to the basics of keeping safe in the lab5. Introducing the student to know the importance of biomolecules6. Introducing the student to accept the experience in theoretical and practical subject through Four years of study . |
| **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, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 63 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 4 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 87 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 5.8 |
| **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** | **Assignments** | 2 | 10 | 3,7,11,13 | 1,2,3,4 |
| **Q** | 2 | 10 | 4.9,15 | 1,2,3,4 |
| **report** | 1 | 10 | 12 | 4 |
| **lab** | 2 | 10 | continuous | 5 |
| **Midterm Exam** | 2hr | 10% (10) | 10 | LO ALL |
| **Summative assessment** | **Final Exam** | 2hr | 60%  | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Definition of Biochemistry-chemical basic of life-Polymeric biomolecules and their monomeric building blocks.-The reasons for studying of living matter. |
| **Week 2** | Carbohydrates:-Introduction, Definition, Functions of carbohydrates-Classification: Monosaccharides ,Disaccharides. |
| **Week 3** | Polysaccharides, Oligosaccharides.-Starch. sources- -Glycogen, sources. |
| **Week 4** | Lipids:Fatty acids, waxes, phospholipids: classification Importance of phospholipids, Triglyceride.Cholesterol, properties, physiological importance |
| **Week 5** | -First Exam. |
| **Week 6** | Nucleic Acid:-Introduction, Nucleosides, Nucleotides.-DNA structure, Function of. DNA.* -RNA: Structure, Types of RNA ,their functions Differences between DNA and RNA.
 |
| **Week 7** | -Amino acid, Peptide and Proteins* Sources of protein. .

-Essential and non-Essential amino acids.* Peptide bond .

-Properties of proteins. |
| **Week 8** | Environmental Implication of Food-Fats, oils, carbohydrates-Protein, Vitamins, fertilizers. |
| **Week 9** | Second exam. |
| **Week 10** | Introduction to Enzymology.-class of enzymes, enzyme specificity and mechanism of action.-flow of genetic information |
| **Week 11** | -The regulation of the activity of Enzymes.-Transcription, translation and regulation of gene expression.-Bioenergetics and basic cellular metabolic prose.  |
| **Week 12** | Global problems.-Fossil fuel energy and global warming.-Greenhouse Effect. |
| **Week 13** | Vitamins* Vitamin A, Sources, Importance.
* Vitamin B, Sources, importance.
* -Vitamin D, Sources ,Importance.
 |
| **Week 14** | Free presentation. |
| **Week 15** | Third Exam. |
| **Week 16** | Environmental Implication of Food-Fats, oils, carbohydrates-Protein, Vitamins, fertilizers. |

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| **Delivery Plan (Weekly Lab. Syllabus)****المنهاج الاسبوعي للمختبر** |
|  | **Material Covered** |
| **Week 1** | Lab 1 Introduction to Techniques Experiment use of pipetmen: |
| **Week 2** | Lab 2: Specific identification of Suger-1 |
| **Week 3** | Lab 3:Spesific identification of Sugar II |
| **Week 4** | Lab 4:Specific identification of lipid I |
| **Week 5** | Lab 5: Specific identification of lipid II |
| **Week 6** | Lab 6: Specific identification of Amino acid |
| **Week 7** | Lab 7: Specific identification of Protein |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Lininger A.l Nelson | متوفر |
| **Recommended Texts** | Weiner, R,F,Environmental engineering 4th ed,.Clinical chemistry I D.Ali Altemimi |  |

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
|  |  |  |  |  |
| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department |  |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Engineering Drawing and AutoCAD | **Module Delivery** |
| **Module Type** | Basic | * **Theory**
* **Lecture**
* **Lab**
 |
| **Module Code** | EDAU124 |
| **ECTS Credits**  | 6 |
| **SWL (hr/sem)** | 150 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 2 |
| **Administering Department** | CES.OP | **College** | CES |
| **Module Leader** | Ayad Dari JaafarGaidaa Saeed Mahdi | **e-mail** | Ayad.D.Jaafar@uotechnology.edu.iqgaidaa.s.mahdi@uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Master. |
| **Module Tutor** | None | **e-mail** | None |
| **Peer Reviewer Name** | Dr. Qusay Al-Salhy | **e-mail** | qusay.f.abdulhameed@uotechnology.edu.iq |
| **Review Committee Approval** | 01/06/2023 | **Version Number** | 1.0 |

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| **Relation with Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **Semester** |  |
| **Co-requisites module** | None | **Semester** |  |
| **Module Aims, Learning Outcomes and Indicative Contents****أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** |
|  **Module Aims****أهداف المادة الدراسية** | Engineering Drawing1. The aims of the course provide a deep knowledge, wide scope and improved understanding of the engineering drawing.
2. The students should gain knowledge to apply the engineering drawing in engineering applied.

Auto CAD1. Understand the fundamental concepts and features of Auto CAD.
2. Learn sketching and taking field dimensions.
3. Take Data and transform it into graphic drawings.
4. Learn basic engineering drawing formats.
5. Learn basic Auto CAD skills.
6. Learn how draw 2D and 3D drawings in Auto CAD.
 |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | Engineering Drawing1. The students can be use Tools Drawing in draw and analyze geometric shapes.
2. Enable students to draw devices, equipment & PFD in chemical engineering

Auto CAD1. Utilize the power and precision of Auto CAD as a drafting and design tool used in chemical engineering design.
2. Apply basic CAD concepts to develop and construct accurate 2D geometry.
3. Create, manipulate and edit 2D drawings and figure.
4. Apply elements of mechanical drafting such as layers,. dimensions, drawing format
5. Create, manipulate 3D drawings and figure.
 |
| **Indicative Contents****المحتويات الإرشادية** | Engineering Drawing* 1 Introduction 3 hr.
* 2 Planning of Drawing paper 3hr.
* 3 Types of line 3hr.
* 4 Engineering operation 3hr.
* 5 Projections Drawing 3hr.
* 6 First angle projection 3hr.
* 7 Third angle projection 3hr.
* 8 Full section 3hr.
* 9 Half section 3hr.
* 10 The finding of third view 3hr.
* 11 Application Example 3hr.
* 12 Pictorial Drawing (Isometric and Oblique) 3hr.
* 13 Dimensions 3hr.
* 14 Examples of Chemical Engineering drawing and exercises.

Auto CAD* Introduction, drawing program screen components, Setting drawing limits, Units, Grid and snap, Zoom, Orthogonal, Osnap.

2D drafting: Cartesian system coordinate, AutoCAD drawing command (6hrs).* Point, Line: line, multi-line, construction line, drawing line by using: absolute coordinate, polar coordinate, relative coordinate, Examples.
* Continuous line drawing: Rectangle, Polygon, Poly line with their options, Examples (6 hrs).
* Curves drawing: Arc, Circle, point –SP line, Ellipse with their options, Example (6 hrs).

Modify command: * 1-copy tool: copy, mirror, offset, array. 2- Erase tool: erase, trim, break .3-move tool: move, rotate Examples (6 hrs).4- Change tool: stretch, Lengthen, Extend, Scale, Chamfer, and Fillet .5-Explode, Examples (6 hrs).
* Layers: Create a new layer, rename layer, active layer, run and extinguishing layers, Freezing layers, Lock and open layers, the color, Font type, Line width, Example (6 hrs).
* 3D drawing methods: Surfaces drawing: box, Wedge, Pyramid, Dome, Sphere, Cone, Torus, Dish, Example (6 hrs).
* 3D drawing methods: Solids: box, Cylinder, Sphere, Cone, Wedge, Torus, Examples (6 hrs).
 |
| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | The main strategy that will be adopted in the delivery of this module is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes, giving engineering designs, participating in solving them, and competing in giving ideas and skills for the solution. |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL(h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 93 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 6 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 57 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 3.8 |
| **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** | 4 | 10% (10) | 3-10 | LO #1, 2, 4,5,and 7 |
| **Assignments** | 5 | 5% (5) | 2-13 | LO # 1-7 |
| **Projects / Lab.** | 1 | 10% (10) | Continuous |  |
| **Report** | 1 | 5% (5) | 13 | LO # 1-7 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 20% (20) | 6,14 | LO # 1-7 |
| **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Introduction and Planning of Drawing paper. |
| **Week 2** | Types of line and Engineering operation. |
| **Week 3** | Projection Drawing, first angle projection and third angle projection. |
| **Week 4** | Full section, half section, the finding of third view and application Example. |
| **Week 5** | Pictorial Drawing (Isometric and Oblique) and Application Example. |
| **Week 6** | Dimensions, examples of chemical engineering drawing and exercises.  |
| **Week 7** | Final Exam. |
| **Week 8** | Introducing the AutoCAD program and interfaces and Drawing settings, preparing the drawing screen and worksheet. |
| **Week 9** | Create two-dimensional graphics (line drawing methods)(rectangle, circle). |
| **Week 10** | Create two-dimensional graphics (polygon, Arc, polyline, Ellipse). |
| **Week 11** | Modification Operations(Erase, Copy, Mirror, Offset, Move, Explode,Fillet,chamfer, Trim,). |
| **Week 12** | Modification Operations (Rotate, Scale,Extend , Array, Break, Stretch) |
| **Week 13** | Drawing with layers |
| **Week 14** | 3D drawing methods: Surfaces drawing |
| **Week 15** | 3D drawing methods: Solids |
| **Week 16** | Final Exam |

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| **Delivery Plan (Weekly Lab. Syllabus)****المنهاج الاسبوعي للمختبر** |
| **Week**  | **Material Covered** |
| **Week 1** | Lab 1: Drawing rectangular using lines in absolute coordinate, polar coordinate, relative coordinate |
| **Week 2** | Lab 2: Drawing line,rectangular,circle |
| **Week 3** | Lab 3: Drawing Arc, polygon, point –SP line, Ellipse |
| **Week 4** | Lab 4: Drawing simple 2D shape and applying Modify commands such as copy, mirror, offset, array , trim, move, rotate , stretch, Lengthen, Extend, Scale, Chamfer, and Fillet |
| **Week 5** | Lab 5: Drawing a simple 2D chemical engineering drawing and applied layers. |
| **Week 6** | Lab 6:3D drawing methods: Surfaces drawing |
| **Week 7** | Lab 7: 3D drawing methods: Solids |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available**  |
| **Required Texts** | Engineering Drawing1.الرسم الھندسي،تاليف (عبد الرسول الخفاف) الطبعة الثانية١٩٩٣ 2. R.P Hoelscher and C.H Springer "Engineering Drawing and Geometry AutoCAD1-Terry T. Wohler, applying AutoCAD 2002 fundamentals, Glencoe /McGraw-Hill.2-James A. Leach, AutoCAD 2002 Companion Essentials of AutoCAD plus Solid modeling ,2003, McGraw-Hill, Boston.3- Terry T. Wohler, applying AutoCAD a step by step approach for AutoCAD release 13, 1996, Glencoe McGraw-Hill.4- James A. Leach, AutoCAD 14 Companion Essentials of AutoCAD plus Solid modeling ,1999, WCB / McGraw-Hill, Boston. | no |
| **Recommended Texts** | David Byrnes and Mark Middlebrook, AutoCAD® 2007 For Dummies , Wiley Publishing, Inc. | No |

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
|  |  |  |  |  |
| Note: |  |  |
| NB 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. |

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|  | Ministry of Higher Education and Scientific Research - IraqUniversity of TechnologyChemical Engineering Department | **University of Technology - Iraq** |

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Workshops | **Module Delivery** |
| **Module Type** | Suplement | * **Practical**
 |
| **Module Code** | WOSH106 |
| **ECTS Credits**  | 8 |
| **SWL (hr/sem)** | 200 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **Administering Department** | Training and Workshops Center |  **College** |  |
| **Module Leader** | Prof. |  **e-mail** | twc@uotechnology.edu.iq |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | Ph.D. |
| **Module Tutor** | None |  **e-mail** | None |
| **Peer Reviewer Name** |  Dr. Asawer A. Alwasiti |  **e-mail** | Asawer.A.Alwasiti@uotechnology.edu.iq |
| **Review Committee Approval** | 08/ 06/2023 | **Version Number** | 1.0 |

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| **Relation With Other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | Secondary School | **Semester** |  |
| **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-Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession.2. Enable the student to know and understand work systems, risks, and the factors surrounding them.3. Enable the student to know and understand theoretical principles in handicrafts and measurements. |
| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1- To familiarize the student with the vocabulary of occupational safety and its importance in the field of work.2- Acquisition of the student’s manual operation skills, for example (Filings and Tinsmith workshops), and mechanical operation skills, for example (Turning).3- Acquisition of the student’s mechanical forming skills, for example (Casting and Blacksmithing).4- The student acquires basic engineering skills such as Welding, Carpentry, and Electrical installations that serve him in the professional field.5- Enabling the student to operate the various machines and devices in mechanical operations and formation.6- Cooperative learning by working collectively. |
| **Indicative Contents****المحتويات الإرشادية** | 1. Introducing the student to the basics of the art of turning and milling, types of cold working machines, the skill of dealing with them, choosing metals, operational tools, and methods of measurement and standardization
2. Introducing the student to the basics of the art of casting, hot forming, metal selection, method of working on casting furnaces and tools, and manufacturing casting molds
3. Familiarize students with the basics of cars and the systems they use, as well as maintenance, disassembly, and assembly processes.
4. Introducing students to the basics of household and industrial electrical appliances, the skill of using tools, and designing electrical circuits and control panels
5. Introducing the student to the basics of the art of plumbing, leveling surfaces, the skill of using tools, manufacturing and installing geometric shapes, and methods of measurement and standardization
6. Introducing the student to the basics of the art of blacksmithing, cold and hot forming of metals, the method of hardening them, and the skills of dealing with hand tools, forming machines, and heating furnaces
7. Introducing the student to the basics of the art of filing and manual operation of metals with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and the methods of measurement and standardization
8. Introducing the student to the basics of the art of welding, the installation and assembly of metals, the types of welding machines, the skills of dealing with them, the types of welding, and the methods of measurement and standardization
9. Introducing the student to the basics of the art of carpentry and woodworking with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and methods of measurement and standardization
 |
| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** |  |

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| **Student Workload (SWL)****الحمل الدراسي للطالب** |
| **Structured SWL (h/sem)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 93 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 6 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 7 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 0.46 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | 100 |
| **Structured SWL (h/year)****الحمل الدراسي المنتظم للطالب خلال الفصل** | 186 | **Structured SWL (h/w)****الحمل الدراسي المنتظم للطالب أسبوعيا** | 6 |
| **Unstructured SWL (h/year)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 14 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 0.46 |
| **Total SWL (h/year)****الحمل الدراسي الكلي للطالب خلال الفصل** | 200 |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** |  |  |  |  |
| **Assignments** |  |  |  | All |
| **Projects / Practice** | Every 3 weeks | 60% | Continuous |  |
| **Summative assessment** | **Midterm Exam** |  |  |  |  |
| **Final Exam** | Every 3 weeks | 40% | Continuous | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)****المنهاج الاسبوعي النظري** |
| **Week**  | **Material Covered** |
| **Week 1** | Welding workshop.-Occupational safety and its importance in welding workshops.-Introduction to the basics of welding.-Electric arc exercise.-An exercise for welding straight lines in a circular motion (helical). |
| **Week 2** |  Welding workshop- An exercise for welding straight lines with a crescent movement and other welding methods-Construction welding exercise. |
| **Week 3** | Welding workshop.-Welding two pieces together.-Written exam in practical exercises. |
| **Week 4** | Casting workshop-Occupational safety and its importance in plumbing workshops.-Introduction to the basics of metal casting.-Simple wooden disc exercise.Half workout. |
| **Week 5** | Casting workshopWheel exercise.Pushing arm exercise. |
| **Week 6** | Casting workshop.-Complete pulley exercise.-Circular pole exercise.-Written exam in practical exercises. |
| **Week 7** | Blacksmith Workshop-Occupational safety and its importance in blacksmithing workshops.-Introduction to the Basics of Blacksmithing.- Barbell adjustment exercise.-Eight-star exercise.- Exercise forming the number eight in English.-Six formation exercises in English. |
| **Week 8** | Blacksmith Workshop-An exercise forming the number five in English.- Exercise forming the number nine in English.. -An exercise in forming an iron model in the form of a circle |
| **Week 9** | Blacksmith Workshop- S-shape exercise.- Air hammer hot barbell exercise.- Exercise to form a circle on an electric bending machine.- Exercising cold and hot ornament formation.. - A written exam in practical exercises |
| **Week 10** | Automotive Workshop-Occupational safety and its importance in car maintenance workshops.-An introduction to cars and their basic parts.-Parts of the engine, how it works, types of engines, and methods of classification. |
| **Week 11** | Automotive Workshop- Open the engine and identify the parts-Lubrication system-Cooling system.  |
| **Week 12** | Automotive Workshop-The fuel system.-The old and new ignition circuits.-Written exam in practical exercises. |
| **Week 13** | Turning Workshop-Introduction to lathe machines and identifying their parts-Measuring tools and the use of an oven measuring instrument-Circular column lathing exercise on different diameters.  |
| **Week 14** | Turning Workshop-Exercise using the pen (semicircular R) brackets.An exercise in making different angles using a pen (square + angle pen 55).  |
| **Week 15** | Turning Workshop- Making shaft with different diameter exercises using (left and right pen)- Workout (Tube Connection).-Written exam in practical exercises. |
| **Week 16** | Fitting workshopOccupational safety and its importance in filing workshops-An introduction to the basics of filing-Pen holder exercise “preparation and preparation”  |
| **Week 17** | Fitting workshopPencil holder exercises finishing and assembling.  |
| **Week 18** | Fitting workshop-The catcher exercise. - Clamping exercise.Written exam in practical exercises. |
| **Week 19** | Carpentry workshop-Occupational safety and its importance in carpentry workshops.- An introduction to carpentry, its types, types of wood, tools used, and preparation Preparing the tools usedFace modification exercise using the reindeer |
| **Week 20** | Carpentry workshopGarden fence work and how to connect its parts, the eight-star exercise |
| **Week 21** | Carpentry workshop- Wood smoothing exercise using smoothing paper- Wood dyeing exercise in three stagesFinal smoothing and varnishing exerciseWritten exam in practical exercises  |
| **Week 22** | The tinsmith workshop Occupational safety and its importance in plumbing workshopsAn introduction to plumbing, its tools, and plumbing stagesPlanning and marking exercise on metal plates |
| **Week 23** | The tinsmith workshopGeometric shapesTypes of individuals and methods of individualsGeometric shape individuals exercise on a metal board |
| **Week 24** | The tinsmith workshopCone members exercise- Exercise of cylinders with an oblique cutRoll forming operationsConnection without the use of an intermediaryWritten exam in practical exercises |
| **Week 25** | Electric WorkshopOccupational Safety and its importance in electrical workshopsAn introduction to the basics of electrical installations- Linking a simple circuit consisting of a lamp to the control of a single-way switch.Connect two lamps in series with one-way switch control.Connecting two lamps in parallel with the control of a single road switch.Connect two lights with one-way dual switch control. |
| **Week 26** | electric WorkshopConnect a fluorescent lamp circuit to a one-way switch controlConnecting an electric supply socket circuit to the control of a separate or combined one-way switchWritten exam in practical exercises |
| **Week 27** | electric WorkshopOccupational Safety and its importance in blacksmithing workshopsIntroduction to the basics of Blacksmithing- Barbell adjustment exerciseEight-star exercise- Exercise forming the number eight in EnglishExercise forming the number six in English |
| **Week 28** | supplementary training curriculumWelding workshopPlumbing workshopBlacksmith's workshop |
| **Week 29** | supplementary training curriculum- Automotive workshop- Turning workshopFitting workshop  |
| **Week 30** | supplementary training curriculumCarpentry workshopThe plumbing workshopelectric Workshop |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Workshop technology and measurements, Ahmed Salem Al-Sabbagh, | yes |

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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 | **مقبول بقرار** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
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| Note: |  |  |
| NB 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. |