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| **Benha University****Faculty of Science****Department of Mathematics** |
| **Computer Science B.Sc.** **Program** |
| **2022/2023** |

Appendix 6

Course Specification

***FIRST LEVEL***

***FIRST SEMESTER***

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| **Course Specification**  |
| **A- Affiliation** |
| **Relevant program:** |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Mathematics |
| **Academic year/level:**  | First level / First Semester |
| **Date of specifications approval:** | 9/12 / 2021, No. (390) and updated 2022/2023 meeting no.( 419). |
| B - Basic information |
| **Title:** **Introduction to Computer Science (1)** | **Code:** **Com 101** | **Year/level:** First level / First Semester |
|  | **Lectures: 2** **h/week** | **Tutorial: ــــ** |
|  | **Practical: 2h/week**  | **Total C. Hrs.:** **3 h/week** |
| C - Professional information |
| **1 – Course Learning Objectives:** |
|  **At the end of this course, the students must be able to****Reveal wide background knowledge related to different branches of computer science. Use such knowledge and understanding in the modeling and design of computer-based systems in a way that demonstrate comprehension of tradeoff involved in design choices.** |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:****At the end of this course, the students must be able to:**1. **Identify how the hardware and software are integrated to create computer systems and distinguish between selected forms of computer hardware architecture and operating system technology.**
2. **Explain the definitions and the relation between the distinct numerical systems.**
3. **Memories the programming concepts and the types of variables.**
4. **Write a program using a selected language for solving a mathematical problem.**

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| **b - Intellectual skills:****At the end of this course, the students must be able to:**1. **Apply the knowledge and understanding of the Computer-Science processes for modeling of real-world problems.**
2. **Construct abstract and mathematical models of computer and communications systems.**
 |
| **c - Practical and professional skills:** **At the end of this course, the students must be able to:** 1. **Prepare a program using a programming language for solving a real problems in professional practice.**
2. **Investigate competence in the use of programming in problem solving.**
 |
| **d - General skills:** **At the end of this course, the students must be able to:**1. **Community linked thinking and solve problems on scientific basis.**
2. **Working in groups effectively; manage time, collaborate and communicate with others positively.**
3. **Ethical behavior with property rights,**
 |
| **3 – Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| **Fundamentals of programming and computer languages (1)** | **2** | - | **2** |
| **Fundamentals of programming and computer languages (2)** | **2** | - | **2** |
| **Fundamentals of programming and computer languages (3)** | **2** | - | **2** |
| **Algorithm and Flowcharts (1)** | **2** | - | **2** |
| **Algorithm and Flowcharts (2)** | **2** | - | **2** |
| **Elements of Language under case** | **2** | - | **2** |
| **Revision and Mid-Term Exam** | **2** | - | **2** |
| **Basic Instructions in Language under case (1)** | **2** | - | **2** |
| **Basic Instructions in Language under case (2)** | **2** | - | **2** |
| **Control Instructions (1)** | **2** | **-** | **2** |
| **Control Instructions (2)** | **2** | **-** | **2** |
| **Functions and Some applications** | **2** | **-** | **2** |
| **Subprograms** | **2** | **-** | **2** |
| **Applications** | **2** | **-** | **2** |
| **Total hours** | **28** | **-** | **28** |

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| **4 - Teaching and Learning methods:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | **a1-** | **Identify how the hardware and software are integrated to create computer systems and distinguish between selected forms of computer hardware architecture and operating system technology.** | **🗸** |  |  |  | **🗸** |  |
| **a2-** | **Explain the definitions and the relation between the distinct numerical systems.** |  | **🗸** |  |  | **🗸** |  |
| **a3-** | **Memories the programming concepts and the types of variables.** | **🗸** |  |  |  | **🗸** |  |
| **a4-** | **Write a program using a selected language for solving a mathematical problem** | **🗸** |  |  |  | **🗸** |  |
| **Intellectual Skills** | **b1** | **Apply the knowledge and understanding of the Computer-Science processes for modeling of real-world problems.**  |  |  |  | **🗸** |  | **🗸** |
| **b2** | **Construct abstract and mathematical models of computer and communications systems.** |  |  |  | **🗸** |  | **🗸** |
| **Practical and professional skills** | **c1-** | **Prepare a program using a programming language for solving a real problems in professional practice.** | **🗸** |  |  |  | **🗸** |  |
| **c2-** | **Investigate competence in the use of programming in problem solving.** | **🗸** |  |  |  | **🗸** |  |
| **General Skills** | **d1-** | **Community linked thinking and solve problems on scientific basis..** |  | **🗸** | **🗸** |  |  |  |
| **d2-** | **Working in groups effectively; manage time, and communicate with others positively.** |  | **🗸** | **🗸** |  |  |  |
| **d3-** | **Ethical behavior with property rights.** |  | **🗸** | **🗸** |  |  |  |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools:** | **To Measure** | **Time schedule** | **Grading** |
|  **Mid-Term Exam** | **a1, a2, b1,d1** | **Week 7** | **14%** |
| **Oral exam** | **a1, a2, a3,d2,d3** | **Week 15** | **14 %** |
| **Practical exams**  | **c1, c2** | **Week 15** | **14 %** |
| **Written exam** | **a1,a2,a3,a4,** **b1**, **b2** | **Start of 16th week**  | **48 %** |
| **Total** | **100 %** |

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| **6 – Course Matrix** |
| **Topic** | **Knowledge & Understanding** | **Intellectual Skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **a4** | **b1** | **b2** | **c1** | **c2** | **d1** | **d2** | **d3** |
| **Fundamentals of programming and computer languages (1)** | **x** |  |  |  | **x** |  | **x** |  |  |  | **x** |
| **Fundamentals of programming and computer languages (2)** | **x** | **x** |  |  |  |  |  | **x** | **x** |  |  |
| **Fundamentals of programming and computer languages (3)** |  | **x** |  |  | **x** |  |  | **x** |  |  |  |
| **Algorithm and Flowcharts (1)** |  |  |  | **x** |  |  |  |  | **x** |  |  |
| **Algorithm and Flowcharts (2)** |  |  | **x** |  |  | **x** | **x** |  |  |  |  |
| **Elements of Language under case** |  | **x** |  |  |  | **x** |  |  | **x** |  |  |
| **Revision and Mid-Term Exam** | **x** |  |  | **x** |  |  |  | **x** |  |  | **x** |
| **Basic Instructions in Language under case (1)** |  | **x** |  |  |  | **x** |  |  |  | **x** |  |
| **Basic Instructions in Language under case (2)** |  |  | **x** | **x** |  |  | **x** |  |  |  |  |
| **Control Instructions (1)** |  | **x** |  | **x** |  | **x** |  |  |  |  |  |
| **Control Instructions (2)** |  |  |  |  |  |  |  |  |  | **x** |  |
| **Functions and Some applications** |  |  |  | **x** |  | **x** |  |  |  |  |  |
| **Subprograms** |  |  |  |  |  | **x** |  |  |  | **x** |  |
| **Applications** |  | **x** |  |  |  |  | **x** |  | **x** |  | **x** |

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| **7- List of references:** |
| **7-1 Course notes****-Notes approved by Math. Department** * 1. **Required books.**

[**J. Glenn Brookshear**](http://en.bookfi.org/g/J.%20Glenn%20Brookshear)**, D. Smith and D. Brylow,**[***Computer Science: An Overview***](http://en.bookfi.org/book/436945)**, *11th Edition*, Marquette University Faculty, 2012.****7-3 Recommended books.** **T.H. Cormen, C. E. Leiserson, R.L. Rivest and C. Stein,** [***Introduction to Algorithms, Second Edition***](http://www.amazon.com/Introduction-Algorithms-Second-Edition-Thomas/dp/0262032937/ref%3Dcm_lmf_tit_3/182-4276557-0906207)**, McGraw-Hill Book Company, 2001.** * 1. **Periodicals, Web sites, etc.**

**https://en.wikiversity.org/wiki/Introduction\_to\_Computer\_Science** |
| **8- Facilities required for teaching and learning:** |
| **Black board, white board and data show.** |
| **Course coordinator:** | **Dr.** **Abeer Al-Fishawy** |
| **Head of the Department:** | **Prof. Dr. Reda Gamal Abd El Rahman** |
| **Date: 9 / 12 /2021** | **Updated 2022/2023** |

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| **Course Specification**  |
| **A- Affiliation** |
| **Relevant program:** |  **Computer Science** |
| **Department offering the program:** | **Mathematics** |
| **Department offering the course:** | **Mathematics** |
| **Academic year/level:**  | **First level / First Semester** |
| **Date of specifications approval:** | **9 /12 / 2021, No. (390) and updated 2022/2023 meeting no.( 419).** |
| B - Basic information |
| **Title:** **calculus** | **Code:** **Mat 111** | **Year/level:** **First level / First Semester** |
| **Teaching Hours: 42 h** | **Lectures: 2** **h/week** | **Tutorial: 2** **h/week** |
|  | **Practical: ــــ** | **Total:** **3 h/week** |
| C - Professional information |
| **1 – Course Learning Objectives:** |
| **At the end of this course, the students must be able to** **Postulate concepts and choose appropriate solutions to solve problems on scientific basis, apply mathematical knowledge and skills to the solution of real life problems.** |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:** **At the end of this course, the students must be able to:**1. **To know Mathematical knowledge in solving different problems.**
2. **Determine knowledge of the principles of mathematical modeling and applications.**
3. **Explain the meaning of complicated statements using mathematical notations and language.**
 |
| **b - Intellectual skills:** **At the end of this course, the students must be able to:**1. **Apply the knowledge of the mathematical processes for modeling of real-world problems.**
2. **Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.**
3. **Confirm wide background knowledge related to the different branches of Mathematics.**
 |
| **c - Practical and professional skills:** **At the end of this course, the students must be able to:**1. **Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.**
2. **Examine competence in the use of mathematical methods in problem solving.**
3. **Investigate confidence in their abilities to use mathematics.**
 |
| **d - General skills:** **At the end of this course, the students must be able to:**1. **Community linked thinking and solve problems on scientific basis.**
2. **Working in groups effectively; manage time, and communicate with others positively.**
3. **Ethical behavior with property rights .**
 |
| **3 – Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| **Mathematical induction**  | **2** | **2** | **-** |
|  **partial fractions**  | **2** | **2** | **-** |
| **Polynomials** | **2** | **2** | **-** |
| **Determinants** | **2** | **2** |  |
| **Matrices** | **2** | **2** | **-** |
| **Linear systems**  | **2** | **2** | **-** |
| **Mid Term Exam and Series** | **2** | **2** | **-** |
| **Taylor series** | **2** | **2** |  |
| **Limits** | **2** | **2** |  |
| **Continuity** | **2** | **2** | **-** |
| **Differentiation of Real valued functions** | **2** | **2** | **-** |
| **Applications on Differentiation** | **2** | **2** | **-** |
| **Integration** | **2** | **2** | **-** |
| **Finite integral** | **2** | **2** | **-** |
| **Total hours** | **28** | **28** | **-** |

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| **4 - Teaching and Learning methods:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | **a1-** | **To know** **Mathematical knowledge in solving different problems.** | **🗸** |  |  |  | **🗸** |  |
| **a2-** | **Determine knowledge of the principles of mathematical modeling and applications.** | **🗸** |  |  |  | **🗸** |  |
| **a3-** | **Explain the meaning of complicated statements using mathematical notations and language.** | **🗸** |  |  |  | **🗸** |  |
| **Intellectual Skills** | **b1** | **Apply the knowledge of the mathematical processes for modeling of real-world problems.** |  |  | **🗸** |  |  | **🗸** |
| **b2** | **Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.** |  |  | **🗸** |  |  | **🗸** |
|  | **b3** | **Confirm wide background knowledge related to the different branches of Mathematics.** | **🗸** |  |  |  | **🗸** |  |
| **Practical and professional skills** | **c1-** | **Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.**  | **🗸** |  |  |  | **🗸** |  |
| **c2-** | **Examine competence in the use of mathematical methods in problem solving.** | **🗸** |  |  | **🗸** | **🗸** |  |
| **c3-** | **Investigate confidence in their abilities to use mathematics.** | **🗸** |  |  |  | **🗸** |  |
| **General Skills** | **d1-** | **Community linked thinking and solve problems on scientific basis.** |  | **🗸** | **🗸** | **🗸** |  |  |
| **d2-** | **Working in groups effectively; manage time, and communicate with others positively.** |  | **🗸** | **🗸** |  |  |  |
| **d3-** | **Ethical behavior with property rights .** |  | **🗸** | **🗸** |  |  |  |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools:** | **To Measure** | **Time schedule** | **Grading** |
|  **Mid-Term Exam** | **a1, a2,b2,b3,c3** | **Week 7** | **10 %** |
| **Oral exam** | **a1, a2, c1, c2,a3,d3,d2** | **Week 15** | **10 %** |
| **Written exam** | **a1, a2, c1, c2, d1,b1** | **Start of 16th week**  | **80 %** |
| **Total** | **100 %** |

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| **6- Course Matrix** |
| **Topic** | **Knowledge and understanding** | **Intellectual skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **b1** | **b2** | **b3** | **c1** | **c2** | **c3** | **d1** | **d2** | **d3** |
| **Mathematical induction**  | **x** |  |  | **x** |  |  |  | **x** |  |  |  | **x** |
|  **partial fractions**  |  | **x** | **x** |  |  | **x** |  |  |  | **x** |  |  |
| **Polynomials** | **x** |  |  |  |  | **x** |  |  |  |  |  | **x** |
| **Determinants** |  |  | **x** |  |  |  |  |  |  | **x** |  |  |
| **Matrices** |  | **x** |  |  | **x** |  |  | **x** |  |  |  |  |
| **Linear systems**  | **x** |  |  |  |  |  | **x** |  |  |  |  | **x** |
| **Mid Term Exam and Series** |  | **x** |  | **x** |  |  |  |  |  | **x** |  |  |
| **Taylor series** | **x** |  |  |  |  |  |  |  | **x** |  |  | **x** |
| **Limits** |  | **x** |  |  |  | **x** |  |  | **x** |  | **x** |  |
| **Continuity** | **x** |  |  | **x** |  |  |  |  |  |  |  |  |
| **Differentiation of Real valued functions** |  |  |  |  | **x** |  |  | **x** |  |  |  |  |
| **Applications on Differentiation** |  |  | **x** |  |  |  | **x** |  |  |  | **x** | **x** |
| **Integration** | **x** | **x** |  |  |  | **x** |  |  |  | **x** |  |  |
| **Finite integral** | **x** |  |  | **x** | **x** |  |  |  |  |  | **x** |  |

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| **7- List of references:****7-1 Course notes** **-Notes approved by Math. Department.****7-2 Required books.****- Virgil Snyder, Elementary textbook on the calculus.** [**New York,**](https://archive.org/search.php?query=publisher%3A%22New+York%2C+Cincinnati%2C+American+Book+co%22)  **(1912).****7-3 Recommended books.** **- WWL Chen, Notes on first-year calculus, (web edition, 2008).****7-4 Periodicals, Web sites, etc.**[https://cims.nyu.edu/~kiryl/Calculus/Section\_5.3--Evaluating\_Definite\_Integrals/RSimpson- Lecture24.pdf](https://cims.nyu.edu/~kiryl/Calculus/Section_5.3--Evaluating_Definite_Integrals/RSimpson-%20%20Lecture24.pdf)<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.368.2271&rep=rep1&type=pdf><http://www.maths.manchester.ac.uk/~bespalov/teaching/2E1_LA_notes_1.pdf><https://people.richland.edu/james/lecture/m116/matrices/> |
| **8- Facilities required for teaching and learning:** **Black board and white board**  |
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|  **Course coordinator:** |  **Dr. Nahed Al-Mohammadi****Dr. Ahmed Mohamed** |
|  **Head of the Department:** |  **Prof. Dr. Reda Gamal Abd El Rahman**  |
|  **Date: 9 /12 /2021** |  **updated 2022/2023** |

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| **Course Specification****General Physics (1): 100 Ph** |
| **A- Affiliation** |
| **Relevant program:**  |  Computer Science |
| **Department offering the program:** |  Mathematics |
| **Department offering the course:** |  Department of Physics |
| **Academic year/level:**  |  First level  |
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| **Dates of program specifications approval: The most recent date of the program specification approval: 9/12/2021 (Faculty council; meeting number, 390) updated in 2022/2023, meeting number 419.** |
| B - Basic information | **Code:** 100 Ph | **Year/level:** First level |
| **Teaching Hours:**  | **Lectures: 2** | **Tutorial: 1** |
|   | **Practical:0** | **Total:** 2 h/week |
| **C - Professional information** |
| **1 – Course Learning Objectives:**The objective of this course enable the student to collect and recognize a lot of knowledge about the main topics of the Properties of Matter and Heat, such as the elasticity and plasticity of material, the different types of stresses and strains , moment of inertia , simple harmonic motion in addation to the different types of wave equation and interference of waves and some basics of fluid dynamics. Study Unary phase digrame of matter, types of thermometers and temprature scales, heat conduction and radiation, methods of specific heat measurments and Gas laws and thermodynamics . This will supported by some applications in each field .  |
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| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should be able to:a.1- Understande the concept of matter, Heate , Simple harmonic motion , fluid dynamics , types of heat counductions and thermodynamics. a.2- Describe the moment of inertia of rigid body and phase digram.a.3- Recognize the different types of wave motion such as simple pindulumn,oscillating spring and ,wave equation and interference of waves. a.4- Memorize the different types of stresses – strains of matter, thermometers and temperature scales. |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to:b.1- Create over view about the dimension theory, waves nature, heat transform and thermodynamics.b.2- deduce some models to exam the validity of physical low.b.3- develop appropriate judgment in accordance with physical meaning of course topics. b.4- Differentiate between the physical properties for different types of materials. |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: |
| c.1- Sketch the phase diagram stress- strain curve for different types of materials. c.2- Analyze the output data from each technique. c.3- Extract physical properties from tables and graphs.  **d - General skills:**On successful completion of the course, the student should be able to:d.1- Work in team to synthesis and studying some physical properties of some materials.d.2- Apply scientific models to solve physical problems. d.3- Collect data from internet and wrighting reports in the application of some topics. **3**- **Contents** |

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| **No.**  | **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1 | Physical quantity.  | **2** | **1** | **0** |
| 2 | Dimension theory.  | **2** | **1** | **0** |
| 3 | Units. | **2** | **1** | **0** |
| 4 | balance equation. | **2** | **1** | **0** |
| 5 | Types of motion. | **2** | **1** | **0** |
| 6 | Motion in different directions.  | **2** | **1** | **0** |
| 7 | **Mid- Term Exam & review.**  | **2** | **1** | **0** |
| 8 | Second newton low of motion. | **2** | **1** | **0** |
| 9 | Work and energy. | **2** | **1** | **0** |
| 10 | Introduction in heat.  | **2** | **1** | **0** |
| 11 | Heat and heat transfer.  | **2** | **1** | **0** |
| 12 | Kinetic theory of gases. | **2** | **1** | **0** |
| 13 | Specific heat of gases. | **2** | **1** | **0** |
| 14 | First law of thermodynamics. | **2** | **1** | **0** |
| **Total hours** | **28** | **14** | **0** |

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| **4 - Teaching and Learning methods:** |

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| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a.1 | Understanding the concept of matter, Heate, Simple harmonic motion, fluid dynamics, types of heat counductions and thermodynamics. | x | 0 | 0 | x | x | 0 |
| a.2 | Describe the moment of inertia of rigid body and phase digram. | x | 0 | 0 | x | 0 | x |
| a.3 | Recognize the different types of wave motion such as simple pendulumn, oscillating spring, wave equation and interference of waves. | x | x | 0 | x | x | 0 |
| a.4 | Memorize the different types of stresses – strains of matter, thermometers and temperature scales**.** | x | 0 | 0 | x | x | 0 |
| **Intellectual Skills** | b.1 | Create over view about the dimension theory, waves nature, heat transform and thermodynamics. | x | 0 | 0 | x | 0 | 0 |
| b.2 | Deduce some models to exam the validity of physical law. | x | x | 0 | x | 0 | x |
| b.3 | Develop appropriate judgment in accordance with physical meaning of course topics. | x | 0 | 0 | x | x | 0 |
|  b.4 | Differentiate between the physical properties for different types of materials. | x | 0 | 0 | x | 0 | 0 |
| **Practical and professional skills** | c.1 | Sketch the phase diagram stress- strain curve for different types of materials and | x | 0 | 0 | x | x | 0 |
| c.2 |  Analyze the output data from each technique.  | x | x | 0 | x | x | 0 |
| c.3 | Extract physical properties from tables and graphs.  | x | 0 | 0 | x | 0 | 0 |
| **General Skills** | d.1 | Work in team to synthesis and studying some physical properties of some materials | x | 0 | 0 | x | x | x |
| d.2 | Apply scientific models to solve physical problems.  | x | 0 | 0 | x | 0 | 0 |
| d.3 | Collect data from internet and wrighting reports in the application of some topics. | x | 0 | 0 | x | x | x |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools:** | To Measure | **Time schedule** | **Grading** |
| Semester Work  | a.1, a.2, a.4, b.1, b.2, c.1, c.2, d.2, d.2 and d.3.  | Fifth week | 5% |
|  Mid-Term Exam | a.1, a.3, a.4, b.3, b.4, d.2, c.3 and d.3. | Seventh week | 5% |
| Oral exam | a.1, a.3, a.4, b.3, b.4, c.3, and d.3. | Fifteenth week | 10% |
| Written exam | a.1 to a.4, b.1 to b.4, c.1 to c.3 and d2. | sixteenth week | 80% |
| Total | 100 % |

**6- List of references:**

**6-1 Course notes**

 Lecture notes approved by Physics department.

* 1. **Required books.**
1. Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011).
2. Physics for Scientists and Engineers 9th Edition by Raymond A. Serway.
	1. **Recommended books.**

1. General Physics and heat (G.A. Grant) Published by Edward Arnold, 1977

ISBN 10: [071312623X](http://www.abebooks.co.uk/products/isbn/9780713126235?cm_sp=bdp-_-9780713126235-_-isbn10) / ISBN 13: [9780713126235](http://www.abebooks.co.uk/products/isbn/9780713126235?cm_sp=bdp-_-9780713126235-_-isbn13).

* 1. **Periodicals, Web sites, etc.**
1. [https://www.amazon.com/Physics-Scientists-Eng…/…/ref=sr\_1\_5…](https://www.amazon.com/Physics-Scientists-Eng%E2%80%A6/%E2%80%A6/ref%3Dsr_1_5%E2%80%A6)
2. http://www. Physics2000.
3. http://www. Physics today.

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| **7- Facilities required for teaching and learning:** |
| * Using a microphone in lectures.
* Using a black board.
* Group Discussions.
* Data show.
 |

 **Course coordinator Head of the Department**

 Prof. Dr. Saed Abed Elghany Prof. Dr. Saed Abed Elghany

 Dr. Mohammed Ali

 **Date:** 2022 /2023

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| **Course Specification****Practical physics (1): 180 Ph** |
| **A- Affiliation** |
| **Relevant program:**  |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Physics |
| **Academic year/level:**  | First level |
|  |  |
| **Dates of program specifications approval: The most recent date of the program specification approval: 9/12/2021 (Faculty council; meeting number, 390) updated in 2022/2023, meeting number 419.** |
| B - Basic information | **Code:** 180 Ph | **Year/level:** First level |
| **Teaching Hours:**  | **Lectures:** 0 | **Tutorial: 0** |
|  | **Practical:** 3 | **Total:** 1 h/week |
| **C - Professional information** |
| **1 – Course Learning Objectives:**By Finishing of this course the graduate will able to understand the experimental method to identify and measure some physical quantity related to the properties of material and heat. Able to verify the physical lows. How to calculate the mathematical errors and use the suitable units. Work in teem to collect data and writing an assay. knows some applications of physics in the industry.  |
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| **2 - Intended Learning Outcomes (ILOS)** |
| **a- Knowledge and understanding:**On successful completion of the course, the student should able to:a.1- Recognize the concept of physical quantity and physical phenomenaa.2- Investigate some physical lows a.3- tell about the physical principles and experiments  |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to:b.1- Compare between the applications of each physical apparatus. b.2- Interpret the output data from experimental systems. b.3- Construct simple systems to verify the physical lows.  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to:c.1- Sketch the practical data. c.2- Use the laboratory equipment and instruments c.3- Analyze data form each techniques and tools considering scientific ethics |
|  **d - General skills:**On successful completion of the course, the student should be able to.d.1- Solve problems and bulding experimental physical system.d.2- Communicate to work efficiently in a team or separately. d.3- Collect data and wrighting reports in the different physical topics. |

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| **3 – Contents** |
| **No.** | **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1 | Introduction in the units, tools, errors and precise measurements.  | **0** | **0** | **3** |
| 2 | Archimedes experiment.  | **0** | **0** | **3** |
| 3 | Newton law of cooling.  | **0** | **0** | **3** |
| 4 | Specific heat of solid materials. | **0**  | **0** | **3** |
| 5 | Simple pendulum.  | **0** | **0** | **3** |
| 6 | Viscosity of liquid.  | **0** | **0** | **3** |
| 7 | **Mid-Term Exam**  | **0** | **0** | **3** |
| 8 | Melting point.  |  **0**  | **0** | **3** |
| 9 | Surface tension.  | **0** | **0** | **3** |
| 10 | Hook law.  | **0** | **0** | **3** |
| 11 | Velocity of sound.  | **0**  | **0** | **3** |
| 12 | Joule experiment.  | **0** | **0** | **3** |
| 13 | Linear expansion. | **0** | **0** | **3** |
| 14 | Review and summary  | **0** | **0** | **3** |
|  |  **Total hours** | **0** | **0** | **42** |

**4- Teaching and Learning methods:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a.1 | Recognize the concept of physical Quantity and physical phenomena. | 0 | 0 | 0 | x | x | 0 |
| a.2 | Investigate some physical lows.  | 0 | x | 0 | x | 0 | x |
| a.3 | Understand the physical principles and experiments.  | 0 | 0 | x | x | x | 0 |
| **Intellectual Skills** | b1 | Compare between the applications of each physical apparatus.  | 0 | x | 0 | x | 0 | 0 |
| b.2 | Analyze the output data from experimental systems. | 0 | 0 | x | x | x | x |
| b.3 | Construct simple systems to verify the physical lows. | 0 | 0 | x | x | 0 | 0 |
| **Practical and professional skills** | c.1 | Sketch the practical data. | 0 | 0 | 0 | x | x | 0 |
| c.2 | Use the laboratory equipment and instruments. | 0 | 0 | 0 | x | x | 0 |
| c.3 | Analyze data form each techniques and tools considering scientific ethics.  | 0 | x | x | x | 0 | 0 |
| **General Skills** | d.1 | Solve problems and bulding experimental physical system. | 0 | 0 | 0 | x | x | x |
| d.2 | Communicate to work efficiently in a team or separately. | 0 | 0 | x | x | 0 | 0 |
| d.3 | Collect data and wrighting reports in the different physical topics. | 0 | x | 0 | x | x | x |

**5- Students’ Assessment Methods and Grading:**

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| **Tools:** | To Measure | **Time schedule** | **Grading** |
| Semester Work  | a.1, a.2, a.3, b.1, b.2, c.1, c.2, d.1 and d.2.  | Fifth week | 10% |
|  Mid-Term Exam | a.1, a.3, b.2, b.3, d.2, c.3, and d.3. | Seventh week | 10% |
| Oral exam | a.2, a.3, b.2, b.3, c.3, and d.3. | Fifteenth week | 20% |
| Final exam | a.1 to a.3, b.1 to b.3, c.1 to c.3 and d1. | Sixteenth week | 60% |
| Total | 100 % |
| **6- List of references:** |
| **6-1 Course notes**Practical notes approved by Physics department. **6-2 Required books.**1- The concepts and theories of modern physics by John Bernhard Stallo, BiblioBazaar (2009).* 1. **Recommended books.**

1-Ancient and Modern Physics by Thomas E. Willson HardPress Publishing (2010).2-Physics: for Scientists and Engineers with Modern Physics, 3rd Ed by Paul M. Fishbane and ‎ Stephen Gasiorowicz.**6-4 Periodicals, Web sites, etc.**1-[https://www.amazon.com/Physics-Scientists-En…/…/ref=sr\_1\_12…](https://www.amazon.com/Physics-Scientists-En%E2%80%A6/%E2%80%A6/ref%3Dsr_1_12%E2%80%A6)2-http://www. Physics2000.3-http://www. Physics today.     |

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| **7- Facilities required for teaching and learning:** |
| * Using a black board.
* Group Discussions.
* Data show.
* Equipements.

 **Course coordinator Head of the Department** Ass. Prof. Mohamed abd Elmonem Prof. Dr. Saed Abed ElghanyDr. Asmaa Jaber |
| **Date: 2022/2023** |  |
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| **Course Specification****Applied Physics (1): 183 Ph**  |
| **A- Affiliation** |
| **Relevant program:**  |  Computer Science. |
| **Department offering the program:** |  Mathematics |
| **Department offering the course:** |  Department of Physics |
| **Academic year/level:**  |  First level |
|  |  |
| Date of specifications approval by the faculty council: The most recent Date of specifications approval by the faculty council: The most recent date of the program specification approval: 9/12/2021 (Faculty council; meeting number, 390) updated in 2022/2023, meeting number 419.B - Basic information |
| **Title:** applied Physics **(1)**  | **Code:** 183 Ph | **Year/level:** First level |
| **Teaching Hours:**  | **Lectures: 0** | **Tutorial: 2** |
|   | **Practical:0** | **Total:** 1 h/week |
| C - Professional information |
| **1 – Course Learning Objectives:**The objective of this course enable the student to collect and recognize a lot of knowledge about the main topics of the Properties of Matter and Heat, such as the elasticity and plasticity of material, the different types of stresses and strains, moment of inertia, simple harmonic motion in addation to the different types of wave equation and interference of waves and some basics of fluid dynamics. Study Unary phase digrame of matter, types of thermometers and temprature scales, heat conduction and radiation, methods of specific heat measurments and Gas laws and thermodynamics. This will supported by some applications in each field.  |
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| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should demonstrate knowledge and understanding of:a.1- Understanding the concept of matter, Heat, Simple harmonic motion, fluid dynamics, types of heat counductions and thermodynamics. a.2- Describe the moment of inertia of rigid body and phase digram.a.3- Recognize the different types of wave motion such as simple pindulumn, oscillating spring, and wave equation and interference of waves. a.4- Memorize the different types of stresses – strains of matter, thermometers and temperature scales. |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to.b.1- Create over view about the dimension theory, waves nature, heat transform and thermodynamics.b.2- Deduce some models to exam the validity of physical low.b.3- Develop appropriate judgment in accordance with physical meaning of course topics. b.4- Differentiate between the physical properties for different types of materials. |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: |
| c.1- Sketch the phase diagram stress- strain curve for different types of materials.c.2- Analyze the output data from each technique. c.3- Extract physical properties from tables and graphs.**d - General skills:**On successful completion of the course, the student should be able to:d.1- Work in team to synthesis and studying some physical properties of some materials.d.2- Apply scientific models to solve physical problems. d.3- Collect data from internet and wrighting reports in the application of some topics. **3**- **Contents** |
| **No.**  | **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1 | Application on Physical quantity.  | 0 | 1 | 0 |
| 2 | Application on Dimension theory.  | 0 | 1 | 0 |
| 3 |  Application on Unites. | 0 | 1 | 0 |
| 4 | Application on balance equation. | 0 | 1 | 0 |
| 5 | Application on Types of motion. | 0 | 1 | 0 |
| 6 | Application on Motion in different directions.  | 0 | 1 | 0 |
| 7 | **Mid- Term Exam & review**  | 0 | 1 | 0 |
| 8 | Application on second Newton low of motion. | 0 | 1 | 0 |
| 9 | Application on Work and energy.  | 0 | 1 | 0 |
| 10 | Application on Introduction in heat.  | 0 | 1 | 0 |
| 11 | Application on Heat and heat transfer.  | 0 | 1 | 0 |
| 12 | Application on Kinetic theory of gases.  | 0 | 1 | 0 |
| 13 | Application on Specific heat of gases. | 0 | 1 | 0 |
| 14 | Application on First law of thermodynamics. | 0 | 1 | 0 |
| **Total hours** | 0 | 14 | 0 |

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| **4 - Teaching and Learning methods:** |

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| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a.1 | Understanding the concept of matter, Heat, Simple harmonic motion, fluid dynamics, types of heat counductions and thermodynamics. | x | 0 | 0 | x | x | 0 |
| a.2 | Describe the moment of inertia of rigid body and phase digram. | x | 0 | 0 | x | 0 | x |
| a.3 | Recognize the different types of wave motion such as simple pindulumn, oscillating spring, wave equation and interference of waves. | x | x | 0 | x | x | 0 |
| a.4 | Memorize the different types of stresses – strains of matter, thermometers and temperature scales**.** | x | 0 | 0 | x | x | 0 |
| **Intellectual Skills** | b.1 |  Create over view about the dimension theory, waves nature, heat transform and thermodynamics. | x | 0 | 0 | x | 0 | 0 |
| b.2 | Deduce some models to exam the validity of physical low. | x | x | 0 | x | 0 | x |
| b.3 | Develop appropriate judgment in accordance with physical meaning of course topics. | x | 0 | 0 | x | x | 0 |
|  b.4 | Differentiate between the physical properties for different types of materials. | x | 0 | 0 | x | 0 | 0 |
| **Practical and professional skills** | c.1 |  Sketch the phase diagram stress- strain curve for different types of materials. | x | 0 | 0 | x | x | 0 |
| c.2 | Analyze the out put data from each technique.  | x | x | 0 | x | x | 0 |
| c.3 | Extract physical properties from tables and graphs. | x | 0 | 0 | x | 0 | 0 |
| **General Skills** | d.1 | Work in team to synthesis and studying some physical properties of some materials. . | x | 0 | 0 | x | x | x |
| d.2 | Apply scientific models to solve physical problems.  | x | 0 | 0 | x | 0 | 0 |
| d.3 | Collect data from internet and wrighting reports in the application of some topics. | x | 0 | 0 | x | x | x |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools:** | To Measure | **Time schedule** | **Grading** |
| Semester Work  | a.1, a.2, a.4, b.1, b.2, c.1, c.2, d.2, d.2 and d.3.  | Fifth week | **5%** |
|  Mid-Term Exam | a.1, a.3, a.4, b.3, b.4, d.2, c.3 and d.3. | Seventh week | 5% |
| Oral exam | a.1, a.3, a.4, b.3, b.4, c.3, and d.3. | Fifteenth week | 10% |
| Written exam | a.1 to a.4, b.1 tob.4, c.1 to c.3 and d2. | sixteenth week | 80% |
| Total | 100 % |

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| **6- List of references:** |
| **6-1 Course notes**Lecture notes approved by Physics department. **6-2 Required books.**1-Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011).* 1. **Recommended books.**
1. General Physics and heat (G.A. Grant) Published by Edward Arnold, 1977

BN 10: [071312623X](http://www.abebooks.co.uk/products/isbn/9780713126235?cm_sp=bdp-_-9780713126235-_-isbn10) / ISBN 13: [9780713126235](http://www.abebooks.co.uk/products/isbn/9780713126235?cm_sp=bdp-_-9780713126235-_-isbn13).1. Physics for Engineers and Scientists 3rd ed by Hans C. Ohanian and John T. Markert.
	1. **Periodicals, Web sites, etc.**
2. [https://www.amazon.com/…/…/0393930033/ref=la\_B001IQW79W\_1\_2…](https://l.facebook.com/l.php?u=https%3A%2F%2Fwww.amazon.com%2FPhysics-Engineers-Scientists-Third-Vol%2Fdp%2F0393930033%2Fref%3Dla_B001IQW79W_1_2%3Fs%3Dbooks%26ie%3DUTF8%26qid%3D1515033184%26sr%3D1-2&h=ATPv9yyXL6SpjIMGsgZPMBPVpuv73I0DI7y7eZV8s-TFl0ap7Qu2rlMnDdkGuRaK3f3x7Ng5HB26KXh9dO7_S2xnWz1jrc2sNHUuPgZ7rDtiohLYi7_Nc7YhWyaB78WEUOLfVwYWNVwHq-LwMELS1A1QvlnJ4Y3KTO1e-FgTjNmQQFNO6UUurYWx0U5fAlMrLD4qTSjDQM2QfOPjAxmH_yaom8Ehy7Rp0CYHJMdvRh0KSznmeZAykLiqt34IFb_MEEeEA_qKClq9gxXsSnDC3lECH5ZXyM6PN7IbRCHMesm8)
3. http://www. Physics2000.
4. http://www. Physics today.
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| **7- Facilities required for teaching and learning:** |
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| 1. Using a microphone in lectures.
2. Using a black board.
3. Group Discussions.
4. Data show.
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 **Course coordinator Head of the Department** Dr/. Mostafa Ismail Prof. Dr. Saed Abed Elghany Dr. Al-Mashad |

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| **Course Specification****015 Ur: English**  |
| **A- Affiliation** |
| **Relevant program:** |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Faculty of Arts |
| **Academic year/level:Date of specifications approval:** **Course coordinator:** Prof. Dr. Ghada  | First level**9/12/2021 (faculty member council meeting no. 390), updated 2022/2023 (Faculty council; meeting number, 419).**  |
| **B - Basic information** |
| **Title:** English  | **Code:** 015 Ur | **Year/level:** First level |
| **Teaching Hours:** | **Lectures:** 2 h/week | **Tutorial:** 0 |
|   | **Practical:** 0**Course marks:** 100 marks | **Total:** 2 h/week |
| **C - Professional information** |
| **1 – Overall aim of the course:** |
| This course aims to enhance the students' capabilities on English Language in both writing and speaking. The courses focus on using appropriate grammatical structures and verb tenses. They present an integrated programmer of speaking and writing in English for students of Faculty of Science. They also help the student to understand terminology and provide the correct spelling and words most commonly used in scientific writing. |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should be able to:a1- Know new scientific vocabulary a2- Identify English grammara3- Know how to translate from English into Arabic and vice versa as well as to know writing skills. |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to:b1- Construct the scientific sentences b2- Interpret the scientific paragraphb3- Apply on grammatical rule b4 - Develop students proficiency of English and terminology |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to:c1 – Collect the new vocabulary c2- Summarize the equivalents, opposites adjectives and nouns of the new words |
| **d - General skills:**On successful completion of the course, the student should be able to: d1- Communicate with others d2- Work in group |

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| **3 – Contents** |  |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** | **% of total** |
| 1. Reading comprehension part (1)
 | 2 | 0 | 0 | 7.14% |
| 1. Reading comprehension part (2)
 | 2 | 0 | 0 | 7.14% |
| 1. Reading comprehension part (3)
 | 2 | 0 | 0 | 7.14% |
| 1. Grammar part (1)
 | 2 | 0 | 0 | 7.14% |
| 1. Grammar part (2)
 | 2 | 0 | 0 | 7.14% |
| 1. Grammar part (3)
 | 2 | 0 | 0 | 7.14% |
| 1. Mid-term exam
 | 2 | 0 | 0 | 7.14% |
| 1. Grammar part (4)
 | 2 | 0 | 0 | 7.14% |
| 1. Grammar part (5)
 | 2 | 0 | 0 | 7.14% |
| 1. Translation part (1)
 | 2 | 0 | 0 | 7.14% |
| 1. Translation part (2)
 | 2 | 0 | 0 | 7.14% |
| 1. Writing skills part (1)
 | 2 | 0 | 0 | 7.14% |
| 1. Writing skills part (2)
 | 2 | 0 | 0 | 7.14% |
| 1. Revision
 | 2 | 0 | 0 | 7.14% |
| **Total hours** | **28** | 0 | 0 | 100% |

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| **4 - Teaching and Learning methods against course ILOS:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a1 | Know new scientific vocabulary | X | x | x | 0 | 0 |
| a2 | Identify English grammar | X | x | x | 0 | 0 |
| a3 | Know how to translate from English into Arabic and vice versa | X | x | x | x | 0 |
| a4 | Know writing skill | x | x | x | x | x |
| **Intellectual Skills** | b1 | Construct the scientific sentences | X | x | x | 0 | 0 |
| b2 | Interpret the Scientific paragraph | X | 0 | x | x | x |
| b3 | Apply on grammatical rule. | X | 0 | x | x | x |
| b4 | Develop student's proficiency of English and terminology. | X | x | x | 0 | 0 |
| **Practical and professional skills** | c1 | Collect the new vocabulary | 0 | 0 | 0 | x | x |
| c2 | Summarize the equivalents, opposites adjectives and nouns of the new words | X | x | x | x | x |
| **General Skills** | d1 | Communicate with others | 0 | 0 | x | x | 0 |
| d2 | Work in group. | 0 | 0 | x | x | 0 |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools** | **To Measure** | **Time schedule** | **Grading** |
|  Mid-Term Exam  | a1, a2, b1 to b4,c1 and c2  | Seventh week | **10 %** |
| Oral exam | a1 to a4, b1 to b4,c1,c2 and d1 | Fifteenth week | **10 %** |
| Written exam | a1 to a4 and b1 to b4 | Sixteenth week | **80 %** |
| Total | **100 %** |

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| **Course matrix** |
| **Topic** | **Knowledge and understanding** | **Intellectual skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **a 4** | **b1** | **b2** | **b3** | **b4** | **c1** | **c2** | **d1** | **d2** |
| 1. Reading comprehension part (1)
 | x |  |  |  |  |  |  |  | x | x | x |  |
| 1. Reading comprehension part (2)
 | x |  |  |  |  |  |  |  | x |  |  | x |
| 1. Reading comprehension part (3)
 | x |  |  |  |  | x |  | x | x |  |  |  |
| 1. Grammar part (1)
 |  | x |  |  |  |  | x |  |  | x | x |  |
| 1. Grammar part (2)
 |  | x |  |  |  |  | x | x |  |  |  | x |
| 1. Grammar part (3)
 |  | x |  |  |  |  | x | x |  |  |  |  |
| 1. Mid-term exam
 | x | x |  |  | x |  |  | x | x | x |  |  |
| 1. Grammar part (4)
 |  | x |  |  |  | x |  |  |  |  | x |  |
| 1. Grammar part (5)
 |  | x |  |  |  |  |  |  |  | x |  | x |
| 1. Translation part (1)
 |  |  | X |  |  | x |  | x |  |  | x |  |
| 1. Translation part (2)
 |  |  | X |  |  |  |  |  |  | x |  | x |
| 1. Writing skills part (1)
 |  |  |  | x | X | x |  |  |  | x |  | x |
| 1. Writing skills part (2)
 |  |  |  | x | X |  |  | x |  | x | x | x |
| 1. Revision
 | x | x |  | x | X |  | x | x | x |  |  |  |

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| **6- List of references:****6-1 Course notes**Manual notes handle of University textbook**6-2 Required books** -English Grammar in Use by Raymond Murphy**6-3 Recommended books**- Longman (2003): Active Study Dictionary- A practical English Grammar by A.J. Thomson and A.V. Martinent**6-4 Periodicals, Web sites, etc.**www.google.com  |
| **7- Facilities required for teaching and learning:*** Data show
* Using a black board
 |
| **Course coordinator:Head of the Department:**  | Ms. Dr.Ghada Prof. Dr.  |
| **Date:** | **2022/2023** |

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| **Course Specification****100 Ch: General Chemistry (1)**  |
| **A- Affiliation** |
| **Relevant program:** |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Chemistry |
| **Academic year/level:Date of specifications approval:Course co-coordinator:**  | First level**9/12/2021 (faculty member council meeting no. 390), updated 2022/2023 (Faculty council; meeting number, 419).** Prof. Dr. Ibrahim El Sayed Dr. Maher EL Nagar |
| **B - Basic information** |
| **Title: General Chemistry**  | **Code:** 100 Ch | **Year/level:** First level |
| **Teaching Hours:** | **Lectures:** 2 | **Tutorial:** 0 |
|  | **Practical: 0Course marks:**100 marks  | **Total:** 2 h/week |
| **C - Professional information** |
| **1 – Overall aim of the course:** |
| This course aims to enable the students to study the atomic structures, gases laws, Chemical bonding, geometrical configuration, and state of matter. Also to enable the differentiate between acidic and basic radicals.  |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should demonstrate knowledge and understanding of: a.1- Identify chemical formulae of inorganic and units of some parameters. a.2- Describe characteristics of different states of the matter and practical elements including trends within the periodic table and related theories. |
|  a.3- Define the chemical concepts of inorganic and physical chemistry . |
|  a.4- Know theories of chemical bonding and molecular orbital diagram for diatomic molecules.  |
|  a.5- State the principles of thermochemistry. |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to. b.1- Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties.  b.2-Solve chemical problems using computational.  |
| b.3- Analyze collected chemical data using some data processing skills. b.4- Point out different concepts in inorganic and physical chemistry. b.5- Analyze chemical data to identify the compositions and chemical structures of inorganic and organic compounds. b.6- Determine the properties of different states of matter (gases, liquids and solids). b.7- predict the different shapes of different inorganic materials. |
|  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: c1- Determine the chemical formulae and geometrical shapes of organic and inorganic molecules.  c2-Apply the knowledge that the student studied to propose the molecular  Structures of the molecules. c3- Investigate and identify the acidic and basic radicals. |

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| **d - General skills:**On successful completion of the course, the student should be able to: d1- Use computers and internet for information and communication technology  effectively related to uses of this instruments. d2- Solve problems on the scientific basis taught in this course. d3- Work in a team effectively, manage time, collaborate and communicate with  others positively. d4- Help raising public awareness of the benefits of conserving intellectual  property rights and scientific patents on the individuals and communities. |

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| **3 – Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** | **% of total** |
| 1. Introduction to General Chemistry and the Units
 | 2 | 0 | 0 | 17.4% |
| 1. Identify chemical formulae of inorganic
 | 2 | 0 | 0 | 17.4% |
| 1. Characteristics of different states of the matter and elements including trends within the periodic table and related theories.
 | 2 | 0 | 0 | 17.4% |
| 1. Study the chemical bonding
 | 2 | 0 | 0 | 17.4% |
| 1. State the principles of electrochemistry.
 | 2 | 0 | 0 | 17.4% |
| 1. Study the molecular orbital diagram for diatomic molecules.
 | 2 | 0 | 0 | 17.4% |
| 1. Mid Term Exam.
 | 2 | 0 | 0 | 17.4% |
| 1. Molecular structure
 | 2 | 0 | 0 | 17.4% |
| 1. Study the state of matter
 | 2 | 0 | 0 | 17.4% |
| 1. Thermochemistry study
 | 2 | 0 | 0 | 17.4% |
| 1. Stoichiometric study.
 | 2 | 0 | 0 | 17.4% |
| 1. Atomic structure
 | 2 | 0 | 0 | 17.4% |
| 1. Hybridization
 | 2 | 0 | 0 | 17.4% |
| 1. Revision
 | 2 | 0 | 0 | 17.4% |
| **Total hours** | **28** | 0 | 0 | **100%** |

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| **4 - 4 - Teaching and Learning methods against course ILOS:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a1 | Identify chemical formulae of inorganic and units of some parameters. | x | 0 | x | 0 | 0 | x |
| a2 | Describe characteristics of different states of the matter and practical elements including trends within the periodic table and related theories. | x | 0 | 0 | 0 | x | 0 |
| a3 | Define the chemical concepts of inorganic and physical chemistry. | x | x | x | 0 | X | x |
| a4 | Recognize theories of chemical bonding and molecular orbital diagram for diatomic molecules.  | x | x | x | 0 | X | x |
| a5 | State the principles of thermochemistry. | x | 0 | 0 | 0 | 0 | x |
| **Intellectual Skills** | b1 |  Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties.  | **x** | x | x | **0** | **X** | **x** |
| b2 | Solve chemical problems using computational.  | **x** | 0 | x | **0** | **X** | **x** |
| b3 | Explain the bond lengths, geometries, magnetism, and color of the transition metal complexes depending on understanding of their bonding theories.  | x | x | x | **0** | **X** | **x** |
| **Practical and professional skills** | c1 | Determine the chemical formulae and geometrical shapes of organic and inorganic molecules.  | x | 0 | x | 0 | X | x |
| c2 | Apply the knowledge that the student studied to propose the molecular structures of the molecules. | x | 0 | x | 0 | X | x |
| **General Skills** | d1 | Use computers and internet for information and communication technology effectively related to uses of these instruments. | x | 0 | 0 | 0 | 0 | x |
| d2 | Solve problems on the scientific basis taught in this course. | x | 0 | x | 0 | X | x |
| d3 | Work in a team effectively, manage time, collaborate and communicate with others positively. | x | 0 | x | x | 0 | x |
| d4 | Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities. | x | 0 | 0 | 0 | 0 | x |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools** | **To Measure** | **Time schedule** | **Grading** |
| Semester Work  | a1, a2, a3, b2, and d1  | Fifth week | **5 %** |
|  Mid-Term Exam | a1, a2, a3, a4, and b2 | seventh week | **5 %** |
| Oral exam | a1, a2, a3, a4, b1, b2, b3, c2 and d4 | Fifteenth week | **10 %** |
| Written exam | a1 to a5, b1, b2 and b3. | Sixteenth week | **80 %** |
| Total | **100 %** |

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| **Course matrix** |
| **Topic** | **Knowledge and understanding** | **Intellectual skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **a4** | **a5** | **b1** | **b2** | **b3** | **c1** | **c2** | **d1** | **d2** | **d3** | **d4** |
| 1. Introduction to general Chemistry and the Units
 | **x** |  |  |  |  |  |  |  |  |  | **x** |  | **x** | **x** |
| 1. Identify chemical formulae of inorganic
 |  | **x** |  |  |  | **x** | **x** |  |  | **x** |  | **x** |  |  |
| 1. Characteristics of different states of the matter and elements including trends within the periodic table and related theories.
 |  | **x** |  |  |  |  |  | **x** |  |  | **x** |  | **x** |  |
| 1. Study the chemical bonding
 |  |  |  | **x** |  | **x** |  |  | **x** |  |  |  |  |  |
| 1. State the principles of electrochemistry.
 |  |  | **x** |  |  |  |  |  |  |  |  |  |  | **x** |
| 1. Study the molecular orbital diagram for diatomic molecules.
 |  |  |  | **x** |  |  |  | **x** | **x** |  | **x** |  | **x** |  |
| 1. Mid Term Exam.
 | **x** | **x** | **x** | **x** |  |  | **x** |  |  |  |  |  |  |  |
| 1. Molecular structure
 |  |  |  | **x** |  | **x** | **x** | **x** | **x** | **x** |  | **x** |  |  |
| 1. Study the state of matter
 |  |  | **x** |  |  | **x** |  |  |  |  |  |  |  |  |
| 1. Thermochemistry study
 |  |  |  |  | **x** |  |  |  |  |  | **x** |  | **x** |  |
| 1. Stoichiometric study.
 |  |  | **x** |  |  | **x** |  | **x** |  | **x** |  | **x** |  |  |
| 1. Atomic structure
 |  |  | **x** |  |  | **x** |  |  |  |  | **x** |  |  |  |
| 1. Hybridization
 |  |  | **x** |  |  |  |  |  | **x** |  |  | **x** |  | **x** |
| 1. Revision
 | **x** | **x** | **x** |  | **x** |  | **x** | **x** |  |  |  |  |  |  |

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| **6- List of references:** |
| **6-1 Course notes**Lecture notes approved by Chemistry Department.**6-2 Required books** Peter Atkin, Loretta Jones, Leroy Laverman, Chemical Principle, Sixth Edition, W.H. Freeman, 2012.* 1. **Recommended books**

1- J.D. Lee, Concise Inorganic Chemistry, 5th Edn. Blackwell Science, Australia, 1996.2- N.N. Greenwood, A. EarnShaw, Chemistry of Elements,2nd Edn, Butterworth  Heinemann, USA 1997.* 1. **Periodicals, Web sites, etc**

*Journal* of *Chemical Education* (ACS)Inorganic Chemistry (ACS)http://www.public.asu.edu/~jpbirk/CHM-115\_BLB/Chpt24/http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/ |
| http://www.docbrown.info/page07/appendixtrans11.htm |

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| **7- Facilities required for teaching and learning:** |
|  Using a microphone in lectures Using a black board Group Discussions  Data show |
| **Course coordinator:** |  Prof. Dr. Ibrahim S. AhmedDr. Maher EL Nagar |  |
| **Head of the Department:** | Prof. Dr. wagdi Ali |  |
| **Date:** | **2022/2023** |  |

**Course Specification**

**181 Ch:** **Practical Chemistry (1)**

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| **A- Affiliation** |
| **Relevant program:** |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Chemistry |
| **Academic year/level:Date of specifications approval:Course co-coordinator:**  | First level**9/12/2021 (faculty member council meeting no. 390), updated 2022/2023 (Faculty council; meeting number, 419).**  |
| **B - Basic information** |
| **Title: Qualitative analysis for acidic and basic radicals of inorganic salts**  | **Code:** 181 Ch | **Year/level:** First level |
| **Teaching Hours:** | **Lectures:** 0 | **Tutorial:** 0 |
|  | **Practical:**3**Course marks:**100 marks  | **Total:** 1 h/week |
| **C - Professional information** |
| **1 – Overall aim of the course:** |
| This course aims to enable the students to understand the classification of different groups of acidic and basic radicals of inorganic salts. Also, teach students how to identify unknown inorganic salts and how to separate between mixed basic radicals. |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should demonstrate knowledge and understanding of: a.1-Investigate the qualitative analytical method for identifying different unknown salts. a.2- explain different classification of analytical chemistry. |
|  a.3- Name different inorganic salts (acid and base radicals). |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to. b1- Interpret the given chemical data to identify the unknown inorganic salts. b2- Differentiate between different types of acidic and basic radicals.  |
| b3- Apply the qualitative analytical procedures to identify acidic and basic radicals of unknown salts .  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: c1- investigate the acidic and basic radicals of unknown inorganic salts. c2-identify and distinguish between different mixed basic radicals. |
| **d - General skills:**On successful completion of the course, the student should be able to: d1- Use computers and internet for information and communication technology  effectively. d2- Solve problems on the scientific basis taught in this course. d3- Work in a team effectively, manage time, collaborate and communicate with  others positively. d4- Help raising public awareness of the benefits of conserving intellectual  property rights and scientific patents on the individuals and communities. |

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| **3 – Contents** |  |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** | **% of total** |
| 1. Introduction to qualitative analysis and the classification of different groups of acidic and basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (I) of acidic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (II) of acidic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (III) of acidic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (I) of basic radical
 | 0 | 0 | 3 | 17.4% |
| 1. Midterm exam
 | 0 | 0 | 3 | 17.4% |
| 1. Introduction for basic radicals
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (I) of basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (II) of basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (III) of basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (IV) of basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (V) of basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Qualitative analysis for gp (VI) of basic radicals.
 | 0 | 0 | 3 | 17.4% |
| 1. Revision
 | 0 | 0 | 3 | 17.4% |
| **Total hours** | 0 | 0 | **42** | **100%** |

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|  | **4 - Teaching and Learning methods against course ILOS:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a1 | Investigate the qualitative analytical method for identifying different unknown salts. | x | 0 | x | x | 0 | x |
| a2 | Explain different classification of analytical chemistry. | x | 0 | 0 | x | 0 | 0 |
| a3 | Name different inorganic salts (acid and base radicals). | x | 0 | x | x | x | x |
| **Intellectual Skills** | b1 | Interpret the given chemical data to identify the unknown inorganic salts. | **x** | 0 | x | **x** | **x** | **x** |
| b2 | Differentiate between different types of acidic and basic radicals.  | **x** | 0 | x | **x** | **x** | **x** |
| b3 | Apply the qualitative analytical procedures to identify acidic and basic radicals of unknown salts.  | x | 0 | x | x | **x** | **x** |
| **Practical and professional skills** | c1 | Investigate the acidic and basic radicals of unknown inorganic salts. | x | 0 | x | x | x | x |
| c2 | Identify and distinguish between different mixed basic radicals. | x | 0 | x | x | x | x |
| **General Skills** | d1 | Use computers and internet for information and communication technology effectively. | x | 0 | 0 | x | 0 | x |
| d2 | Solve problems on the scientific basis taught in this course. | x | 0 | x | x | x | x |
| d3 | Work in a team effectively, manage time, collaborate and communicate with others positively. | x | 0 | x | x | 0 | x |
| **5- Students’ Assessment Methods and Grading:** |
| **Tools** | **To Measure** | **Time schedule** | **Grading** |
| Semester Work  | a1, a2, a3, b2, d1 and d3  | Fifth week | **20 %** |
| Midterm exam | a2, a3, b1, b2 and c1 | Seventh week |  |
| Oral exam | a1, a2, a3, b2, d1, and d2 | Thirteenth week | **20%** |
| Practical exam | a1, a2, a3, b1, b2, b3, c1, and c2  | Fourteenth week | **60 %** |
| Total | **100 %** |

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| **Topic** | **Knowledge and understanding** | **Intellectual skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **b1** | **b2** | **b3** | **c1** | **c2** | **d1** | **d2**  | d3 |
| 1. Introduction to qualitative analysis and the classification of different groups of acidic and basic radicals.
 | **x** | **x** |  |  | **x** | **x** | **x** |  | **x** |  |  |
| 1. Qualitative analysis for gp (I) of acidic radicals.
 |  |  | **x** | **x** | **x** |  | **x** |  | **x** | **x xx** | **x** |
| 1. Qualitative analysis for gp (II) of acidic radicals.
 |  |  | **x** | **x** |  |  | **x** |  |  |  | **x** |
| 1. Qualitative analysis for gp (III) of acidic radicals.
 |  |  | **x** | **x** |  |  | **x** |  |  |  | **x** |
| 1. Qualitative analysis for gp (I) of basic radical
 |  |  | **x** | **x** |  |  | **x** |  |  |  | **x** |
| 1. Midterm exam
 |  | **x** | **x** | **x** | **x** |  | **x** |  |  |  |  |
| 1. Introduction for basic radicals
 | **x** |  |  |  | **x** | **x** | **x** |  | **x** | **x xx** |  |
| 1. Qualitative analysis for gp (I) of basic radicals.
 |  |  | **x** | **x** |  |  |  | **x** | **x** |  | **x** |
| 1. Qualitative analysis for gp (II) of basic radicals.
 |  |  | **x** | **x** |  |  |  | **x** |  |  | **x** |
| 1. Qualitative analysis for gp (III) of basic radicals.
 |  |  | **x** | **x** |  |  |  | **x** |  |  | **x** |
| 1. Qualitative analysis for gp (IV) of basic radicals.
 |  |  | **x** | **x** |  |  |  | **x** |  |  | **x** |
| 1. Qualitative analysis for gp (V) of basic radicals.
 |  |  | **x** | **x** |  |  |  | **x** |  |  | **x** |
| 1. Qualitative analysis for gp (VI) of basic radicals.
 |  |  | **x** | **x** |  |  |  | **x** |  |  | **x** |
| 1. Revision
 | **x** | **x** | **x** |  | **x** | **x** | **x** |  |  |  |  |

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| **6- List of references:** |
| **6-1 Course notes**Lecture note approved by Department of Chemistry**6-2 Required books** Zumdahl, S. S. *Chemical Principles, 4th Ed.*; Houghton-Mifflin: New York, 2002, chapter 8.* 1. **Recommended books**

1- Wismer, Robert K. *Qualitative Analysis with Ionic Equilibrium*; Macmillan Publishing Company: New York, 1991. * 1. **Periodicals, Web sites, etc.**

*Journal* of *Chemical Education* (ACS)Inorganic Chemistry (ACS)http://www.public.asu.edu/~jpbirk/CHM-115\_BLB/Chpt24/http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/ |
| http://www.docbrown.info/page07/appendixtrans11.htm |
| **7- Facilities required for teaching and learning:** |
|  Using a microphone in lectures Using of slit overhead projector Using a black board Group Discussions  Data show |
| **Course coordinator:** | Abd EL Raziq Asker |  |
| **Head of the Department:** | Prof. Dr. wagdi Ali |
| **Date:** | **2022/2023** |  |

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| **Course Specification****183 Ch:** **Applied Inorganic chemistry (1)** |
| **A- Affiliation** |
| **Relevant program:** |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Chemistry |
| **Academic year/level:Date of specifications approval:Course coordinator:**  | First level**9/12/2021 (faculty member council meeting no. 390), updated 2022/2023 (Faculty council; meeting number, 419).** Dr. Saher Mohamed |
| ***B - Basic information*** |
| **Title: Applied Inorganic chemistry** | **Code:** 185 Ch | **Year/level:** first level |
| **Teaching Hours:** | **Lectures:** 0 | **Tutorial:** 2 |
|  | **Practical:** 0**Course marks:** 100 marks  | **Total:** 2 h/week |
| ***C - Professional information*** |
| **1 – Overall aim of the course:** |
| This course aims to enable the students to learn and study the general properties for inorganic materials and the difference between organic and inorganic compounds. Students study the properties of some inorganic compounds (such as water, sodium hydroxide, metals,etc). Students also study the preparation of inorganic compounds and their application in various industries such as metals sodium hydroxide, ammonia, sulphuric acid, fertilizers and other.  |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should demonstrate knowledge and understanding of:  |
| a.1- Define chemical concepts of inorganic chemistry. |
| a.2- Identify the chemical formula of inorganic materials |
| a.3- knows the various inorganic compounds that used in different applications. |
| a.4- Describe the preparation of inorganic materials which used in different industries |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to. |
| b1- Compare between the physical and chemical properties of inorganic materials.  |
| b2- Modify the method for extraction metal from its ores.  |
| b3- Report the different inorganic compounds and their applications. |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: |
| c1- Collect the knowledge about various inorganic material in different applications |
| c2- Prepare the different inorganic materials |
| **d - General skills:**On successful completion of the course, the student should be able to: |
| d1- Use computers and internet for information and communication technology effectively |
| d2- Effectively manage tasks, time, and resources. |
| d3- Cooperate and communicate with others members of teamwork positively. |

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| **3 – Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** | **% of total** |
| 1. Introduction to inorganic chemistry
 | 0 | 2 | 0 | 17.4% |
| 1. Classify inorganic compounds and their applications
 | 0 | 2 | 0 | 17.4% |
| 1. Extractive of copper metal from its ores
 | 0 | 2 | 0 | 17.4% |
| 1. Refine copper metal and its applications
 | 0 | 2 | 0 | 17.4% |
| 1. Manufacture of Sodium Hydroxide and chlorine using chlor-alkali and their applications
 | 0 | 2 | 0 | 17.4% |
| 1. Manufacture of Sodium Hydroxide and chlorine using diaphragm and membrane cells
 | 0 | 2 | 0 | 17.4% |
| 1. Mid-term exam
 | 0 | 2 | 0 | 17.4% |
| 1. Raw Materials, nitrogen fixation and application of ammonia
 | 0 | 2 | 0 | 17.4% |
| 1. Manufacture of ammonia using Haber and Carl Bosch process
 | 0 | 2 | 0 | 17.4% |
| 1. Raw Materials, production of sulphur trioxide and application of sulphuric acid
 | 0 | 2 | 0 | 17.4% |
| 1. Manufacture of sulphuric acidusinglead-chamber process
 | 0 | 2 | 0 | 17.4% |
| 1. Manufacture of sulphuric acid using contact process
 | 0 | 2 | 0 | 17.4% |
| 1. Manufacture of nitrogen, potassium, phosphate, and NPK Fertilizers
 | 0 | 2 | 0 | 17.4% |
| 1. Reversion
 | 0 | 2 | 0 | 17.4% |
| **Total hours** | **0** | **28** | **0** | **100%** |

**4 - Teaching and Learning methods against course ILOS:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a1 | Define chemical concepts of inorganic chemistry. | x | 0 | x | 0 | 0 | x |
| a2 | Identify the chemical formula of inorganic materials | x | x | x | 0 | 0 | 0 |
| a3 | Know the various inorganic compounds which used in different applications. | x | x | x | 0 | 0 | x |
| a4 | Describe the preparation of inorganic materials which used in different industries | x | x | x | 0 | x | x |
| **Intellectual Skills** | b1 | Compare between the physical and chemical properties of inorganic materials.  | x | x | 0 | 0 | x | x |
| b2 | Modify the method for extraction metal from its ores | x | 0 | x | 0 | x | x |
| b3 | Report the different inorganic compounds and their applications. | x | x | x | 0 | x | x |
| **Practical and professional skills** | c1 | Collect the knowledge about various inorganic material in different applications | x | 0 | x | 0 | x | x |
| c2 | Prepare the different inorganic materials | x | 0 | x | 0 | x | x |
| **General Skills** | d1 | Use computers and internet for information and communication technology effectively | x | 0 | 0 | x | 0 | x |
| d2 | Effectively manage tasks, time, and resources. | x | 0 | x | x | x | x |
| d3 |  Cooperate and communicate with others members of teamwork positively. | x | 0 | x | 0 | 0 | x |

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| **5- Students’ Assessment Methods and Grading:** |

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| --- | --- | --- | --- |
| **Tools** | **To Measure** | **Time schedule** | **Grading** |
| Semester Work | a1, a2, a3, b2, c1, d1, d2 and d3  | Fifth week | **5 %** |
| Mid-Term Exam | a1, a2, a3, a4, b2,c1, and c2  | Seventh week | **5 %** |
| Oral exam | a1, a2, a3, a4, b1, and b2  | Fifteenth week | **10 %** |
| Written exam | a1, a2, a3, a4, b1, b2 and b3 | Sixteenth week | **80 %** |
| Total | **100 %** |

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| **Course matrix** |
| **Topic** | **Knowledge and understanding** | **Intellectual skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **a4** | **b1** | **b2** | **b3** | **c1** | **c2** | **d1** | **d2** | **d3** |
| 1. Introduction to inorganic chemistry
 | **x** |  | **x** |  | **x** | **x** |  | **x** |  | **x** |  | **x** |
| 1. Classify inorganic compounds and their applications
 |  | **x** | **x** |  |  |  |  | **x** |  |  | **X** |  |
| 1. Extractive of copper metal from its ores
 |  |  |  | **x** |  |  |  |  | **x** |  |  |  |
| 1. Refine copper metal and its applications
 |  |  |  | **x** |  |  |  | **x** | **x** | **x** |  | **x** |
| 1. Manufacture of Sodium Hydroxide and chlorine using chlor-alkali and their applications
 |  |  |  | **x** |  |  |  | **x** | **x** |  |  |  |
| 1. Manufacture of Sodium Hydroxide and chlorine using diaphragm and membrane cells
 |  |  |  | **x** |  |  |  |  | **x** | **x** |  | **x** |
| 1. Mid-term exam
 | **x** | **x** | **x** | **x** |  | **x** |  | **x** | **x** |  |  |  |
| 1. Raw Materials, nitrogen fixation and application of ammonia
 |  |  |  | **x** |  |  |  | **x** |  |  | **X** |  |
| 1. Manufacture of ammonia using Haber and Carl Bosch process
 |  |  |  | **x** |  |  |  |  | **x** |  |  |  |
| 1. Raw Materials, production of sulphur trioxide and application of sulphuric acid
 |  |  |  | **x** |  |  |  | **x** |  | **x** |  | **x** |
| 1. Manufacture of sulphuric acidusinglead-chamber process
 |  |  |  | **x** |  |  |  |  | **x** |  | **X** |  |
| 1. Manufacture of sulphuric acid using contact process
 |  |  |  | **x** |  |  |  | **x** | **x** |  |  |  |
| 1. Manufacture of nitrogen, potassium, phosphate, and NPK Fertilizers
 |  |  |  | **x** |  |  |  | **x** | **x** | **x** | **X** |  |
| 1. Revision
 | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** | **x** |  |  |  |

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| **7- Facilities required for teaching and learning:** |
|  Using a microphone in lectures Using a black board Group Discussions  Data show |
| **Course coordinator:** | Dr. Saher Mohamed |  |
| **Head of the Department:** | Prof. Dr. wagdi Ali  |
| **Date:** | **2022/2023** |  |

***FIRST LEVEL***

***SECOND SEMESTER***

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| **Course Specification** |
| **A- Affiliation** |
| **Relevant program:** |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Mathematics |
| **Academic year/level:**  | First level / Second Semester |
| **Date of specifications approval:** | 9 /12 / 2021, No. (390) and updated 2022/2023 meeting no.( 419). |
| B - Basic information |
| **Title:** **Introduction to computer programing** | **Code:** **Com 102** | **Year/level:** **First level/Second Semester** |
|  | **Lectures: 1** **h/week** | **Tutorial: ـــ** |
|  | **Practical: 2** **h/week** | **Total:** **2 h/week** |
| C - Professional information |
| **1 – Course Learning Objectives:** |
| **: At the end of this course, the students must be able to****This subject is aimed at students with little programming experience. It aims to provide students with an understanding of the role computation can play in solving problems. It also aims to help students, regardless of their major, to feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals. The class will use a programming language, complementing to course 30 U.** |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:** **At the end of this course, the students must be able to:**1. **Outline the computer terms from the textbook, lecture, and readings**
2. **Explain the fundamental programming concepts such as variables , functions , loops and subroutines in a programming language**
3. **Identify application algorithm and use programming language**
4. **Write programs of real world applications**
 |
| **b - Intellectual skills:** **At the end of this course, the students must be able to:**1. **Construct programming in a selected programming language.**
2. **Develop code in programming language and adapt other people's code.**
3. **Organize a detailed algorithmic solution to a well defined problem.**
4. **Design program to solve application problem.**
 |
| **c - Practical and professional skills:** **At the end of this course, the students must be able to:**1. **Show the language syntax in programming problems.**
2. **Recommended programming language to develop more reliable programs.**
 |
| **d - General skills:** **At the end of this course, the students must be able to:**1. **Working in groups effectively and independently.**
2. **Using internet to learn information and communication technology effectively.**
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| **3 – Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| **Basics of programming.** | **1** | **-** | **2** |
| **Algorithms and flowcharts.** | **1** | **-** | **2** |
| **Basics of the programming language** | **1** | **-** | **2** |
| **Types of variables** | **1** | **-** | **2** |
| **Control statements (1)** | **1** | **-** | **2** |
| **Control statements (2)** | **1** | **-** | **2** |
| **Revision and mid-term exam** | **1** | **-** | **2** |
| **Loop statements (1)** | **1** | **-** | **2** |
| **Loop statements (2)** | **1** | **-** | **2** |
| **Array (1)** | **1** | **-** | **2** |
| **Array (1)** | **1** | **-** | **2** |
| **Functions (1)** | **1** | **-** | **2** |
| **Functions (2)** | **1** | **-** | **2** |
| **Some Applications.** | **1** | **-** | **2** |
| **Total hours** | **14** | **-** | **28** |

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| **4 - Teaching and Learning methods:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | **a1-** | **Outline the computer terms from the textbook, lecture, and readings** | **🗸** |  |  |  |  | **🗸** |
| **a2-** | **Explain the fundamental programming concepts such as variables , functions , loops and subroutines in a programming language** | **🗸** |  |  |  |  | **🗸** |
| **a3-** | **Identify application algorithm and use programming language** | **🗸** | **🗸** | **🗸** |  | **🗸** |  |
| **a4-** | **Write programs of real world applications** | **🗸** |  |  | **🗸** |  |  |
| **Intellectual Skills** | **b1** | **Construct programming in a selected programming language.** | **🗸** |  |  | **🗸** |  | **🗸** |
| **b2** | **Develop code in programming language and adapt other people's code.** | **🗸** |  |  | **🗸** |  | **🗸** |
|  | **b3** | **Organize a detailed algorithmic solution to a well defined problem.** | **🗸** |  |  | **🗸** |  | **🗸** |
|  | **b4** | **Design program to solve application problem.** | **🗸** | **🗸** |  | **🗸** |  | **🗸** |
| **Practical and professional skills** | **c1-** | **Show the language syntax in programming problems.**  |  |  |  | **🗸** |  | **🗸** |
| **c2-** | **Recommended programming language to develop more reliable programs.** |  |  |  | **🗸** |  | **🗸** |
| **General Skills** | **d1-** | **Working in groups effectively and independently..** | **🗸** |  |  | **🗸** |  | **🗸** |
| **d2-** | **Using internet to learn information and communication technology effectively** | **🗸** |  |  | **🗸** |  | **🗸** |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools:** | **To Measure** | **Time schedule** | **Grading** |
|  **Mid-Term Exam** | **a1, b1, b2** | **Week 7** | **14%** |
| **Oral exam** | **a1, a2, a3,d1** | **Week 15** | **14 %** |
| **Practical exams**  | **c1, c2,c3,d2** | **Week 15** | **14 %** |
| **Written exam** | **a1,a2,a3,a4,** **b1**, **b2,b3,b4** | **Start of 16th week**  | **48 %** |
| **Total** | **100 %** |

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| **6 – Course Matrix** |
| **Topic** | **Knowledge & Understanding** | **Intellectual Skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **a4** | **b1** | **b2** | **b3** | **b4** | **c1** | **c2** | **d1** | **d2** |
| **Basics of programming.** | **x** | **x** |  |  | **x** |  |  |  | **x** |  |  | **x** |
| **Algorithms and flowcharts.** |  |  |  |  | **x** |  | **x** |  |  | **x** |  | **x** |
| **Basics of the programming language** |  | **x** | **x** |  |  |  |  |  | **x** |  |  |  |
| **Types of variables** |  |  |  |  | **x** |  |  |  |  |  |  |  |
| **Control statements (1)** |  | **x** |  |  |  |  |  | **X** | **x** |  |  | **x** |
| **Control statements (2)** |  |  | **x** |  |  |  |  |  |  | **x** | **x** |  |
| **Revision and mid-term exam** | **x** |  |  |  |  | **x** |  | **X** |  |  |  | **x** |
| **Loop statements (1)** |  |  | **x** |  | **x** |  |  |  |  |  |  |  |
| **Loop statements (2)** |  |  |  |  |  |  |  |  |  |  | **x** | **x** |
| **Array (1)** |  |  |  | **x** |  |  | **x** |  | **x** |  |  |  |
| **Array (1)** |  |  | **x** |  |  | **x** |  |  |  |  | **x** |  |
| **Functions (1)** |  |  | **x** |  |  |  |  |  | **x** |  |  |  |
| **Functions (2)** |  |  |  |  |  |  |  |  |  | **x** | **x** |  |
| **Some Applications.** |  | **x** |  |  |  | **x** |  |  |  |  |  | **x** |

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| **7- List of references****7-1 Course notes** **-Notes approved by Math. Department.*** 1. **Required books.**

B. H. Flowers, *An Introduction to Numerical Methods in C++* , Oxford, 2000.**7-3 Recommended books.****B. Stroustrup, *The C++ Programming Language, 3rd- Edition*, Addison-Wesley, 1997.*** 1. **Periodicals, Web sites, etc.**

**http://www.cplusplus.com/doc/tutorial/** |

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| **8- Facilities required for teaching and learning:** |
| **Black board, white board and data show.** |
|  **Course coordinator:** | **Dr. Mossab Hassan** |
|  **Head of the Department:** | **Prof. Dr.**   **Reda Gamal Abd El Rahman** |
|  **Date: 9 /12 / 2021** | **Updated 2022/2023** |

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| **Course Specification**  |
| **A- Affiliation** |
| **Relevant program:** |  **Computer Science** |
| **Department offering the program:** | **Mathematics** |
| **Department offering the course:** | **Mathematics** |
| **Academic year/level:**  | **First level / Second Semester** |
| **Date of specifications approval:** | **9 /12 / 2021, No. (390) and updated 2022/2023 meeting no.( 419).** |
| B - Basic information |
| **Title:** **statistic** | **Code:** **102 Mat** | **Year/level:** **First level / Second** **Semester** |
| **Teaching Hours: 42 h** | **Lectures: 2** **h/week** | **Tutorial: 2** **h/week** |
|  | **Practical: ــــ** | **Total:** **3 h/week** |
| C - Professional information |
| **1 – Course Learning Objectives:** |
| **: At the end of this course, the students must be able to** **Postulate concepts and choose appropriate solutions to solve problems on scientific basis, apply mathematical knowledge and skills to the solution of real life problems, complementing to course 100 M.** |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:** **At the end of this course, the students must be able to:**1. **To know Mathematical knowledge in solving different problems.**
2. **Determine knowledge of the principles of mathematical modeling and applications.**
3. **Explain the meaning of complicated statements using mathematical notations and language.**
 |
| **b - Intellectual skills:** **At the end of this course, the students must be able to:**1. **Apply the knowledge of the mathematical processes for modeling of real-world problems.**
2. **Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.**
3. **Confirm wide background knowledge related to the different branches of Mathematics.**
 |
| **c - Practical and professional skills:** **At the end of this course, the students must be able to:**1. **Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.**
2. **Examine competence in the use of mathematical methods in problem solving**
3. **Collect wide background knowledge related to the different branches of Mathematics.**
 |
| **d - General skills:**  **At the end of this course, the students must be able to:**1. **Community linked thinking and solve problems on scientific basis.**
2. **Working in groups effectively; manage time, collaborate and communicate with others positively.**
3. **Ethical behavior with property rights.**
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| **3 – Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| **Integration**  | **2** | **2** | **-** |
| **Finite Integration** | **2** | **2** | **-** |
| **Integration Methods (1)** | **2** | **2** | **-** |
| **Integration Methods (2)** | **2** | **2** | **-** |
| **Integration Methods (3)** | **2** | **2** |  |
| **Applications of Finite Integration.** | **2** | **2** | **-** |
| **Mid-Term Exam, Introduction in Plan geometry**  | **2** | **2** | **-** |
| **Straight Line** | **2** | **2** | **-** |
| **Circle** | **2** | **2** | **-** |
| **Conic sections (1)** | **2** | **2** | **-** |
| **Conic sections (2)** | **2** | **2** | **-** |
| **Space geometry** | **2** | **2** | **-** |
| **Geometric transformations** | **2** | **2** | **-** |
| **Surfaces** | **2** | **2** | **-** |
| **Total hours** | **28** | **28** | **-** |

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| **4 - Teaching and Learning methods:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | **a1-** | **Know** **Mathematical knowledge in solving different problems.** | **🗸** |  |  |  | **🗸** |  |
| **a2-** | **Determine knowledge of the principles of mathematical modeling and applications.** | **🗸** |  |  |  | **🗸** |  |
| **a3-** | **State and explain the meaning of complicated statements using mathematical notations and language.** | **🗸** |  |  |  | **🗸** |  |
| **Intellectual Skills** | **b1** | **Apply the knowledge of the mathematical processes for modeling of real-world problems.** |  |  | **🗸** | **🗸** |  | **🗸** |
| **b2** | **Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.** |  |  | **🗸** |  |  | **🗸** |
|  | **b3** | **Confirm wide background knowledge related to the different branches of Mathematics.** |  | **🗸** |  |  |  |  |
| **Practical and professional skills** | **c1-** | **Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.** | **🗸** |  |  |  | **🗸** |  |
| **c2-** | **Examine competence in the use of mathematical methods in problem solving.** | **🗸** |  |  | **🗸** | **🗸** |  |
| **C3** | **Collect wide background knowledge related to the different branches of Mathematics.** |  | **🗸** |  |  |  |  |
| **General Skills** | **d1-** | **Community linked thinking and solve problems on scientific basis.** |  | **🗸** | **🗸** | **🗸** |  |  |
| **d2-** | **Working in groups effectively; manage time, collaborate and communicate with others positively.** |  | **🗸** | **🗸** |  |  |  |
| **d3-** | **Ethical behavior with property rights .** |  | **🗸** | **🗸** |  |  |  |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools:** | **To Measure** | **Time schedule** | **Grading** |
|  **Mid-Term Exam** | **a1, a2,a3,** | **Week 7** | **10 %** |
| **Oral exam** | **a1, c1, c2,b2,b3,d2,d3** | **Week 15** | **10 %** |
| **Written exam** | **a1, a2, c1, c2, d1,b1,c3,d1** | **Start of 16th week**  | **80 %** |
| **Total** | **100 %** |

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| **6- Course Matrix** |
| **Topic** | **Knowledge and understanding** | **Intellectual skills** | **Practical and professional skills** | **General Skills** |
| **a1** | **a2** | **a3** | **b1** | **b2** | **b3** | **c1** | **c2** | **c3** | **d1** | **d2** | **d3** |
| **Integration**  | **x** |  |  | **x** |  |  |  | **x** |  | **x** |  |  |
| **Finite Integration** |  |  | **x** |  |  | **x** |  |  |  |  |  | **x** |
| **Integration Methods (1)** | **x** |  |  |  |  | **x** |  |  |  |  |  |  |
| **Integration Methods (2)** |  |  | **x** |  |  |  |  |  |  | **x** |  |  |
| **Integration Methods (3)** |  | **x** |  |  | **x** |  |  | **x** |  |  |  |  |
| **Applications of Finite Integration.** | **x** |  |  |  |  |  | **x** |  |  |  |  | **x** |
| **Mid-Term Exam, Introduction in Plan geometry**  |  | **x** |  | **x** |  |  |  |  |  | **x** |  |  |
| **Straight Line** | **x** |  | **x** | **x** |  |  |  |  | **x** |  |  | **x** |
| **Circle** |  | **x** |  |  |  |  | **x** |  |  |  |  |  |
| **Conic sections (1)** |  |  |  | **x** |  |  |  |  |  |  | **x** |  |
| **Conic sections (2)** |  | **x** |  |  |  |  |  | **x** |  | **x** |  |  |
| **Space geometry** |  |  | **x** |  | **x** |  |  |  |  |  |  | **x** |
| **Geometric transformations** | **x** |  |  |  |  | **x** |  |  |  | **x** |  |  |
| **Surfaces** | **x** |  |  |  |  |  |  |  | **x** |  | **x** |  |

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| **7- List of references:****7-1 Course notes****-Notes approved by Math. Department.****7-2Required books.****- Virgil Snyder, Elementary textbook on the calculus.** [**New York,**](https://archive.org/search.php?query=publisher%3A%22New+York%2C+Cincinnati%2C+American+Book+co%22)  **(1912).****7-3 Recommended books.** **- WWL Chen, Notes on first-year calculus, (web edition, 2008).** **-George R., The Elements of Plane Analytic Geometry, BiblioBazaar ( 2008).****7-4 Periodicals, Web sites, etc.**<https://en.wikipedia.org/wiki/Conic_section><http://www.stewartcalculus.com/data/ESSENTIAL%20CALCULUS%20Early%20Transcendentals/upfiles/ess-reviewofconics.pdf><http://www.intmath.com/methods-integration/methods-integration-intro.php><http://www.intmath.com/methods-integration/7-integration-by-parts.php>[https://en.wikipedia.org/wiki/Line\_(geometry](https://en.wikipedia.org/wiki/Line_%28geometry%29)(<http://www.mathsisfun.com/geometry/circle.html>  |
| **8- Facilities required for teaching and learning:** **Black board and white board** |
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| **Course coordinator:** | **Nahed El-mohamdy** |
| **Head of the Department:** | **Prof. Dr Reda Gamal Abd El Rahman** |
| **Date: 9 /12 /2021**  | **updated 2022/2023** |

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| **Course Specification****General Physics (2): 105 Ph** |
| **A- Affiliation** |
| **Relevant program:**  |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Physics |
| **Academic year/level:**  | First level |
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| **Dates of program specifications approval: The most recent date of the program specification approval: 9/12/2021 (Faculty council; meeting number, 390) updated in 2022/2023, meeting number 419.** |
| **B - Basic information** | **Code:** 105 Ph | **Year/level:** First level |
| **Teaching Hours:**  | **Lectures:** 2 | **Tutorial:** 1 |
|  | **Practical:** 0 | **Total:**  2 h/week |
| **C - Professional information** |
| **1 – Course Learning Objectives:**By Finishing of this course the graduate will able to collect a lot of scientific information about theories of light and their applications in optical instruments. Study some of the the physical properties for mirrors and lenses . Tell about the eye and farsightedness and nearsightedness. Discover the different types of optical instruments. Understanding the electric and magnetic forces and diffrentiate among field ,potential and electromagnetic force . memorize the types of capacitores and dielectric materials . skach some of the electric circuites  |
|  |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a- Knowledge and understanding:**On successful completion of the course, the student should able to:a.1 Memorise a lot of scientific information about theories of light and electromagnetic field and the applications of each other. a.2- Understand magnetic and electric field nature in addition to mirror and lenses equations.a.3- Tell about the function of eye, electric circuits and capacitors.  |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to.b.1- Interpret data from each optical or electromagnetic systems. b.2- Assess according to beam reflection what is nature of surface and wave, and according to Electromagnetic induction what is the nature of source. b.3- Design optical and electromagnetic system by logic way. b.4- Compare between the use of microscope, telescope, lenses, mirrors and their applications.  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to:c.1- Conduct some experiments using lenses in addition to mirrors and electric circuits.c.2- Analyze the output data from optical and electromagnetic techniques. |
|  c.3- Apply the optical and electromagnetic phenomena in modern area applications**.** **d - General skills:**On successful completion of the course, the student should be able to:d.1- Solve problems concerning to the course topics.d.2- Communicate to work efficiently in a team or separately.d.3- Collect data and wrighting reports in the different model and fields.  |

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| **3 – Contents** |
| **No.** | **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1 | The nature and propagation of light | **2** | **1** | **0** |
| 2 | Reflection and refraction of spherical wave at plane and spherical surfaces | **2** | **1** | **0** |
| 3 | Mirrors and Lenses | **2** | **1** | **0** |
| 4  | The structure of the eye | **2** | **1** | **0** |
| 5 | Cameras, microscopes and Telescopes | **2** | **1** | **0** |
| 6 | Colom's Low and continuity of Colom's low. | **2** | **1** | **0** |
| 7 |  **Mid-Term Exam**  | **2** | **1** | **0** |
| 8 |  Electrostatic field and potential | **2** | **1** | **0** |
| 9 | Capacitors | **2** | **1** | **0** |
| 10 | Dielectric materials | **2** | **1** | **0** |
| 11 | Electric Current and DC Circuits | **2** | **1** | **0** |
| 12 | Kirchhoff Low and electric circuit analysis | **2** | **1** | **0** |
| 13 | Magnetic field and forces | **2** | **1** | **0** |
| 14 | Electromagnetic induction | **2** | **1** | **0** |
|  | **Total hours** | **28** | **14** | **0** |

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| **4 - Teaching and Learning methods:** |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a.1 | Memorise a lot of scientific information about theories of light and electromagnetic field and the applications of each other. | x | 0 | 0 | x | x | 0 |
| a.2 | Understanding magnetic and electric field nature in addition to mirror and lenses equations. | x | 0 | 0 | x | 0 | x |
| a.3 | Tell about the function of eye, electric circuits and capacitors. | x | x | 0 | x | 0 | x |
| **Intellectual Skills** | b1 | Interpret data from each optical or electromagnetic systems.  | x | 0 | 0 | x | 0 | 0 |
| b.2 | Assess according to beam reflection what is nature of surface and wave, and according to Electromagnetic induction what is the nature of source. | x | x | 0 | x | 0 | x |
| b.3 | Design optical and electromagnetic system by logic way.  | x | 0 | 0 | x | 0 | x |
| b.4 | Compare between the use of microscope and telescope and lenses and mirrors and application. | x | x | 0 | x | 0 | x |
| **Practical and professional skills** | c.1 | Conduct some experiments using lenses in addition to mirrors and electric circuits. | x | 0 | 0 | x | 0 | 0 |
| c.2 | Analyze the output data from optical and electromagnetic techniques. | x | 0 | 0 | x | x | 0 |
| c.3 | Apply the optical and electromagnetic phenomena in modern area applications. | x | 0 | 0 | x | 0 | x |
| **General Skills** | d.1 | Solve problems concerning to the course topics. | x | x | 0 | x | x | x |
| d.2 | Communicate to work efficiently in a team or separately. | x | 0 | 0 | x | 0 | 0 |
| d.3 | Collect data and wrighting reports in the different model and fields. | x | 0 | 0 | x | 0 | x |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools** | **To Measure** | **Time schedule** |
| Semester Work  | a.1, a.2, b.1, b.2, c.1, c.2, d.1, and d.2.  | Fifth week |
|  Mid-Term Exam | a.1, a.3, b.3, b.4, d.2, c.3, and d.3. | Seventh week |
| Oral exam | a.1, a.3, b.2, b.3, b.4, c.3, and d.3. | Fifteenth week |
| Written exam | a.1 to a.3, b.1 to b.4, c.1 to c.3 and d1. | Sixteenth week |
| Total |
|

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| **6- List of references:** |
| **6-1 Course notes** Lecture notes approved by Physics department.**6-2 Required books.**1. Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011)

**6-3 Recommended books.**1. General Physics, 2nd Edition by [Morton M. Sternheim](http://www.amazon.com/Morton-M.-Sternheim/e/B001IU0X6M/ref%3Dntt_athr_dp_pel_1) and [Joseph W. Kane](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_2?_encoding=UTF8&field-author=Joseph%20W.%20Kane&search-alias=books&sort=relevancerank) , John Willy and sons. Inc., (1991).
2. Physics for Engineers and Scientists 3rd ed by Hans C. Ohanian and John T. Markert.

**6-4 Periodicals, Web sites, etc.**1. http://www. Physics2000.
2. http://www. Physics today.
3. [https://www.amazon.com/…/…/0393930033/ref=la\_B001IQW79W\_1\_2…](https://l.facebook.com/l.php?u=https%3A%2F%2Fwww.amazon.com%2FPhysics-Engineers-Scientists-Third-Vol%2Fdp%2F0393930033%2Fref%3Dla_B001IQW79W_1_2%3Fs%3Dbooks%26ie%3DUTF8%26qid%3D1515033184%26sr%3D1-2&h=ATPv9yyXL6SpjIMGsgZPMBPVpuv73I0DI7y7eZV8s-TFl0ap7Qu2rlMnDdkGuRaK3f3x7Ng5HB26KXh9dO7_S2xnWz1jrc2sNHUuPgZ7rDtiohLYi7_Nc7YhWyaB78WEUOLfVwYWNVwHq-LwMELS1A1QvlnJ4Y3KTO1e-FgTjNmQQFNO6UUurYWx0U5fAlMrLD4qTSjDQM2QfOPjAxmH_yaom8Ehy7Rp0CYHJMdvRh0KSznmeZAykLiqt34IFb_MEEeEA_qKClq9gxXsSnDC3lECH5ZXyM6PN7IbRCHMesm8)
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| **7- Facilities required for teaching and learning:** |
| * Using a microphone in lectures.
* Using a black board.
* Group Discussions.
* Data show.

 **Course coordinator Head of the Department**  Prof. Dr. Saed Abed Elghany Prof. Dr. Mohammed Ali**Date: 2022/2023** |
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| **Course Specification****Practical physics (2): 181 Ph** |
| **A- Affiliation** |
| **Relevant program:**  |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Physics |
| **Academic year/level:**  |  First level |
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| **B - Basic information** |
| **Title:** Practical Physics (2)  | **Code:** 181 Ph | **Year/level:** Firstlevel |
| **Teaching Hours:**  | **Lectures:** 0 | **Tutorial: 0** |
|  | **Practical:** 3 | **Total:**- 1 h/week |
| **C - Professional information** |
| **1 – Course Learning Objectives:**By Finishing of this course the graduate will able to Understand the experimental method to identify and measure some physical quantity related to the electricity-magnetism and optics. Also, it will be able to verify the physical lows and how to calculate the mathematical errors and use the suitable measurement units. He can work in teem to collect data and write an assay, beside knows some applications of physics in the industry  |
|  |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a- Knowledge and understanding:**On successful completion of the course, the student should able to:a.1- Recognize the concept of physical quantity and physical phenomena.a.2- Memorize some physical lows. a.3- Understand the physical principles and experiments.  |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to. b.1- Compare between the applications of each physical apparatus. b.2- Analyze the output data from experimental systems. b.3 Construct simple systems to verify the physical low.  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: c.1- Sketch the practical data.  c.2- Identify the measuring method and system. |
|  c.3- Apply techniques and tools considering scientific ethics. **d - General skills:**On successful completion of the course, the student should be able to:d.1- Solve problems and bulding experimental physical system.d.2- Communicate to work efficiently in a team or separately.d.3- Collect data and wrighting reports in the different physical topics. |

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| **3 – Contents** |
| **No.** | **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1 | Introduction in the measurement unites, tools, Eros and Precise measurements.  | **0** | **0** | **3** |
| 2 | Ohm’s Law. | **0** | **0** | **3** |
| 3 | The Metric Bridge. | **0** | **0** | **3** |
| 4 | The tangent galvanometer. | **0**  | **0** | **3** |
| 5 | Meld’s experiment.  | **0** | **0** | **3** |
| 6 | Comparison of magnetic moment of two magnets. | **0** | **0** | **3** |
| 7 | **Mid-Term Exam**  | **0** | **0** | **3** |
| 8 | Concave Mirror.  | **0** | **0** | **3** |
| 9 | Convex Lens. | **0** | **0** | **3** |
| 10 | Concave Mirror.  | **0** | **0** | **3** |
| 11 | Convex Lens. | **0** | **0** | **3** |
| 12 | Newton’s formula of the lenses. | **0** | **0** | **3** |
| 13 | Verification of Kirchhoff’s law. | **0** | **0** | **3** |
| 14 | Review and summary. | **0** | **0** | **3** |
|  |  **Total hours** | **0** | **0** | **42** |

**4 - Teaching and Learning methods:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a.1 | Recognize the concept of physical quantity and physical phenomena. | 0 | 0 | 0 | x | x | 0 |
| a.2 | Memorize some physical lows.  | 0 | 0 | 0 | x | 0 | x |
| a.3 | Understand the physical principles and experiments.  | 0 | 0 | x | x | x | 0 |
| **Intellectual Skills** | b.1 | Compare between the applications of each physical apparatus.  | 0 | 0 | 0 | x | 0 | 0 |
| b.2 | Analyze the output data from experimental systems. | 0 | 0 | x | x | x | x |
| b.3 | Construct simple systems to verify the physical lows. | 0 | 0 | 0 | x | 0 | 0 |
| **Practical and professional skills** | c.1 | Sketch the practical data. | 0 | 0 | 0 | x | x | 0 |
| c.2 | Identify the measuring method and system. | 0 | 0 | x | x | x | 0 |
| c.3 | Apply techniques and tools considering scientific ethics.  | 0 | 0 | x | x | 0 | 0 |
| **General Skills** | d.1 | Solve problems and bulding experimental physical system. | 0 | 0 | 0 | x | x | x |
| d.2 | Communicate to work efficiently in a team or separately. | 0 | 0 | x | x | 0 | 0 |
| d.3 | Collect data and wrighting reports in the different physical topics. | 0 | 0 | x | x | x | x |

**5- Students’ Assessment Methods and Grading:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tools:** | To Measure | **Time schedule** | **Grading** |
| Semester Work  | a.1, a.2, a.3, b.1, b.2, c.1, c.2, d.1 and d.2. | Fifth week | 10% |
|  Mid-Term Exam | a.1, a.3, b.2, b.3, d.2, c.3, and d.3. | Seventh week | 10% |
| Oral exam |  a.2, a.3, b.2, b.3, c.3, and d.3. | Fifteenth week | 20% |
| Final exam | a.1 to a.3, b.1 to b.3, c.1 to c.3 and d1. | Sixteenth week | 60% |
| Total | 100 % |
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| **6- List of references:** |
| **6-1 Course notes**Practical notes approved by Physics department. **6-2 Required books.**1. Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011)

**6-3 Recommended books.**1. Physics: for Scientists and Engineers with Modern Physics, 3rd Ed by Paul M. Fishbane and ‎ Stephen Gasiorowicz.

**6-4 Periodicals, Web sites, etc.**1. [https://www.amazon.com/Physics-Scientists-En…/…/ref=sr\_1\_12…](https://l.facebook.com/l.php?u=https%3A%2F%2Fwww.amazon.com%2FPhysics-Scientists-Engineers-Modern-Third%2Fdp%2F0130352993%2Fref%3Dsr_1_12%3Fs%3Dbooks%26ie%3DUTF8%26qid%3D1515032790%26sr%3D1-12%26keywords%3DPhysics%2Bfor%2BScientists%2B%2526%2BEngineers%2Bwith%2BModern%2BPhysics&h=ATPcPqe3giBfYgivljOYA2JmfVfTOFp65X4dWCeUNgnGjYIlAXjG-njPjfdZETCMVne9TEKtxacANH11fB_Q7ZmbM9_OVsrkviPYAs4fuH2wkW8Hr_AH85Xec9No6WmArFvJ43y1TLZdMx0iD8BLp3fBke3T2_QT9MncZOVkhl5akckyE9COy55TIo7Bg5Ei8PA53MvjutxUm-aDMefyX9rPD6nS0UBA-48sdS81ygT39rfPs9jlBfNSkCbgZxRn5lpM4nTT4uF1L5ax9QsWCal7C0CZccl2C1rv7D58DbCe)
2. http://www. Physics2000.
3. http://www. Physics today.
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| **7- Facilities required for teaching and learning:** |
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| * Using a black board.
* Group Discussions.
* Data show.
* Equipements.
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 **Course coordinator Head of the Department**  Dr. Mohammed Abdel-Moneim Prof. Dr. Mohammed Ali**Date**: **2022/2023** |

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| **Course Specification****Applied Physics (2): 185 Ph**  |
| **A- Affiliation** |
| **Relevant program:**  |  Computer Science |
| **Department offering the program:** | Mathematics |
| **Department offering the course:** | Department of Physics |
| **Academic year/level:**  | First level |
|  |  |
| **Title:** Applied Physics (2)   | **Code:** 185 Ph | **Year/level:** First level |
| **Teaching Hours:**  | **Lectures:** 0 | **Tutorial: 2** |
|  | **Practical:** 0 | **Total:**  1h/week |
| C - Professional information |
| **1 – Course Learning Objectives:**By Finishing of this course the graduate will able to collect a lot of scientific information about theories of light and their applications in optical instruments. Study some of the the physical properties for mirrors and lenses.Understand the eye and far sightedness and near sightedness. Discover the different types of optical instruments. Understanding the electric and magnetic forces and diffrentiate among field ,potential and electromagnetic force. Memorize the types of capacitores and dielectric materials . skach some of the electric circuites.  |
|  |
| **2 - Intended Learning Outcomes (ILOS)** |
| **a- Knowledge and understanding:**On successful completion of the course, the student is able to:a.1- Memorise a lot of scientific information about theories of light and electromagnetic field and the applications of each other. a.2- Understanding the magnetic and electric field nature in addition to mirror and lenses equations.a.3- Know the function of eye, electric circuits and capacitors.  |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to.b.1- Interpret data from each optical or electromagnetic systems. b.2- Assess according to beam reflection what is nature of surface and wave, and according to Electromagnetic induction what is the nature of source. b.3- Design optical and electromagnetic system by logic way. b.4- compare between the use of microscope and telescope, lenses and mirrors, and their applications. |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to:c.1- Conduct some experiments using lenses in addition to mirrors and electric circuits. c.2-. Analyze the output data from optical and electromagnetic techniques. |
| c.3- Apply the optical and electromagnetic phenomena in modern area applications**.** **d - General skills:**On successful completion of the course, the student should be able to:d.1- Solve problems concerning to the course topics.d.2- Communicate to work efficiently in a team or separately. d.3- Collect data and wrighting reports in the different model and fields.  |

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| **3 – Contents** |
| **No.** | **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1 | Application on The nature and propagation of light | 0 | 1 | 0 |
| 2 | Application on Reflection and refraction of spherical wave at plane and spherical surfaces | 0 | 1 | 0 |
| 3 | Application on Mirrors and Lenses.  | 0 | 1 | 0 |
| 4 | Application on the structure of the eye. | 0 | 1 | 0 |
| 5 | Application on Cameras, microscopes and Telescopes. | 0 | 1 | 0 |
| 6 | Colomb's Low and & continuity of Colom's low. | 0 | 1 | 0 |
| 7 | **Mid-Term Exam**  | 0 | 1 | 0 |
| 8 |  Application on Electrostatic field and potential**.** | 0 | 1 | 0 |
| 9 | Application on Capacitors. | 0 | 1 | 0 |
| 10 | Application on Dielectric materials. | 0 | 1 | 0 |
| 11 | Application on Electric Current and DC Circuits. | 0 | 1 | 0 |
| 12 | Application on Kirchhoff Low and electric circuit analysis. | 0 | 1 | 0 |
| 13 | Application on Magnetic field and forces. | 0 | 1 | 0 |
| 14 | Application on Electromagnetic induction. | 0 | 1 | 0 |
|  | **Total hours** | **0** | 14 | **0** |

**4 - Teaching and Learning methods:**

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| --- | --- | --- | --- | --- | --- | --- |
| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Tutorial** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a.1 | Memorise a lot of scientific information about theories of light and electromagnetic field and the applications of each other. | x | 0 | 0 | x | x | 0 |
| a.2 | Understanding the magnetic and electric field nature in addition to mirror and lenses equations. | x | 0 | 0 | x | 0 | x |
| a.3 | Understanding the function of eye, electric circuits and capacitors. | x | x | 0 | x | 0 | x |
| **Intellectual Skills** | b1 |  Interpret data from each optical or electromagnetic systems.  | x | 0 | 0 | x | 0 | 0 |
| b.2 | Assess according to beam reflection what is nature of surface and wave, and according to Electromagnetic induction what is the nature of source | x | x | 0 | x | 0 | x |
| b.3 | Design optical and electromagnetic system by logic way.  | x | 0 | 0 | x | 0 | x |
| b.4 | compare between the use of microscope and telescope and lenses and mirrors and application.  | x | x | 0 | x | 0 | x |
| **Practical and professional skills** | c.1 | Counduct some experiments using lenses in addition to mirrors and electric circuits. | x | 0 | 0 | x | 0 | 0 |
| c.2 | Analyze the output data from optical and electromagnetic techniques. | x | 0 | 0 | x | x | 0 |
| c.3 | Apply the optical and electromagnetic phenomena in modern area applications | x | 0 | 0 | x | 0 | x |
| **General Skills** | d.1 |  Solve problems concerning to the course topics. | x | x | 0 | x | x | x |
| d.2 | Communicate to work efficiently in a team or separately. | x | 0 | 0 | x | 0 | 0 |
| d.3 | Collect data and wrighting reports in the different model and fields.  | x | 0 | 0 | x | 0 | x |

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| **5- Students’ Assessment Methods and Grading:** |
| **Tools** | **To Measure** | **Time schedule** | **Grading** |
| Semester Work  | a.1, a.2, b.1, b.2, c.1, c.2, d.1 and d.2.  | Fifth week | 5 % |
|  Mid-Term Exam | a.1, a.3, b.3, b.4, d.2, c.3, and d.3. | Seventh week | 5 % |
| Oral exam | a.1, a.3, b.2, b.3, b.4, c.3, and d.3. | Fifteenth week | 10 % |
| Written exam | a.1 to a.3, b.1 tob.4, c.1 to c.3 and d1. | Sixteenth week | 80 % |
| Total | 100 % |
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| **6- List of references:** |
| **6-1 Course notes**Lecture notes approved by Physics department.**6-2 Required books.**1-Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011)* 1. **Recommended books.**

General Physics, 2nd Edition by [Morton M. Sternheim](http://www.amazon.com/Morton-M.-Sternheim/e/B001IU0X6M/ref%3Dntt_athr_dp_pel_1) and [Joseph W. Kane](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_2?_encoding=UTF8&field-author=Joseph%20W.%20Kane&search-alias=books&sort=relevancerank) , John Willy and sons. Inc., (1991) 1. Physics for Engineers and Scientists 3rd ed by Hans C. Ohanian and John T. Markert.

**6-4 Periodicals, Web sites, etc.**1. [https://www.amazon.com/…/…/0393930033/ref=la\_B001IQW79W\_1\_2…](https://l.facebook.com/l.php?u=https%3A%2F%2Fwww.amazon.com%2FPhysics-Engineers-Scientists-Third-Vol%2Fdp%2F0393930033%2Fref%3Dla_B001IQW79W_1_2%3Fs%3Dbooks%26ie%3DUTF8%26qid%3D1515033184%26sr%3D1-2&h=ATPv9yyXL6SpjIMGsgZPMBPVpuv73I0DI7y7eZV8s-TFl0ap7Qu2rlMnDdkGuRaK3f3x7Ng5HB26KXh9dO7_S2xnWz1jrc2sNHUuPgZ7rDtiohLYi7_Nc7YhWyaB78WEUOLfVwYWNVwHq-LwMELS1A1QvlnJ4Y3KTO1e-FgTjNmQQFNO6UUurYWx0U5fAlMrLD4qTSjDQM2QfOPjAxmH_yaom8Ehy7Rp0CYHJMdvRh0KSznmeZAykLiqt34IFb_MEEeEA_qKClq9gxXsSnDC3lECH5ZXyM6PN7IbRCHMesm8)
2. http://www. Physics2000
3. http://www. Physics today
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| **7- Facilities required for teaching and learning:** |
| 1. Using a microphone in lectures.
2. Using a black board.
3. Group Discussions.
4. Data show.
 |

 **Course coordinator Head of the Department**

Prof. Dr/ Mohamed Ali Prof. Dr. Mohamed Ali

**Dr. Mustafa Ismael**