Al Musanna College of Technology

Department of Information Technology

Course Description Details

Diploma Level

Sl.No	Course Code/Name	Course Description
1	MATH1102- Pure Maths	Demonstrates the definition of a function and its graph, Definition of Polynomial Function with examples, Algebraic Long division, Synthetic Division, Division Algorithm, Remainder Theorem, Exponential Functions, Basic Exponential Graphs: its Properties and Applications, Logarithmic Functions, Common and Natural Logarithms, Exponential & Logarithmic Equations, Trigonometric Functions, Angles and Their measure. Acute Angle Domains, Trigonometric Functions of Acute Angles and Solving Right Triangles. General Angle and Real Number Domain. Reference Triangles & Reference Angles, Circular Functions: Domain &Ranges.Inverse Trigonometric Functions.Law of Sines& Cosines, Solving the ASA, AAS & SSA Case in Sines, SAS & SSS Case in Cosines. Sequence, Series, Arithmetic and Geometric Sequences. Conic Section: Parabola, Ellipse, Hyperbola. Statistics:Mean, Median, Mode,Midrange and weighted mean. Probability: Basic Probability concepts and to compute the Probability of Simple Events using tree diagrams.

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Department of Information Technology

Course Description Details

Diploma Level

Sl.No	Course Code/Name	Course Description
1	ITAD 1100 - Advanced IT Skills	Demonstrates the ability to use the e-learning portal and to manage network spaces, E-Learning applications, advantages and disadvantages. Designing newsletters, brochures, business cards, advertisements, Greeting cards,flyers using publishing software and its design tools. Designing and developing web applications using a web developing softwarethat includes tables, forms, frames, photo gallery, shared borders, graphical theme, inserting hyperlinks, embedding of images, formatting lists, and inserting of files and other objects.Learning to Connect, install and troubleshoot peripherals and other similar devices. Study the various communication/network devices and their benefits. Usage of a statistical analysis package to enter and analyse data. Develop and manipulate databases using queries and create a front-end design for the database using forms.

CHEM 1101	Fundamentals of Chemistry	3 Credit Hours
Prerequisites:	none	
Goal	Introduce the students to the basic concepts of chemistry, which form an integral part of those majoring in science and an essential background for those majoring in other disciplines.	

Objectives

The course should enable the student to:

1. Apply the idea of particles to explain the changes in the states of matter

2. Describe the structure of a simple atom and sketch its electronic structure using the s,p,d and f notations

3. Use symbols, formulae and the mole concept and present reactions by balanced chemical equations

4. Express concentrations of solutions and apply mole concept to solutions and chemical equations

5. Describe the properties and reactions of acids and bases

6. Translate and use solubility curves to determine solubility at required temperature

7. Define oxidation-reduction in terms of electron transfer, write full ionic Redox equation and describe the use of the electrochemical series

8. Apply Faraday's first and second laws of electrolysis and describe the reactions at the electrodes

9. Identify the effects of different factors on reaction rates differentiate between the different types of chemical bonds and use dot/cross diagram to sketch the structure of molecules

10. Relate properties of substances to their structures

11. Identify isomerism, name and describe the structure and reactions of some organic compounds.

Outcomes

The students should be able to:

1. Represent chemical reaction using formulae and balanced equations

2. Construct an atom and sketch its electronic structure using the s,p,d and f notations

3. Apply the mole concept to carry out chemical calculations

4. Interpret solubility curves and use it to determine solubility of salts at a specified temperature

5. Identify a Redox reaction and represent it in two half ionic equations

6. Apply Faraday's first and second law to calculate the amount of a metal deposited during electrolysis

7. Design an electrolytic cell to isolate a pure metal from its ore

8. Distinguish the different types of chemical bonds

9. Recognize the factors affecting the rate of a chemical reaction

10. Identify the importance of catalysts for chemical reactions

11. Demonstrate awareness of the relationship between structure and properties of substances

12. Define a homologous series, isomerism and a functional group

13. Apply acquired knowledge to name and describe the preparation of simple saturated and unsaturated hydrocarbons

ENTW1100   Technical Writing I

ENTW1100	Technical Writing I	3 Credit Hours
Prerequisites		The student should have passed the LEE of Advanced Level in ELC (FP Level4)
Goal		This course aims at enabling the students to communicate effectively and appropriately in writing, based on real life situations. They will also have learned to process information, objectively and persuasively, making use of information and guidelines. They will use English for academic purposes and expository writing, as well as develop writing skills in an integrated manner, making use of the listening, reading and speaking skills.

Objectives	Outcomes

1. Develop clear and accurate written and oral presentation of different tasks.
2. Promote critical thinking, continuous self- assessment and peer review.
3. Encourage independent research skills.
4. Prepare students for their professional environment.
5. Promote active learning and active participation of the students.
6. Provide extensive writing practice to students in order to meet their needs in various academic situations.
	At the end of the course, students should be able to: analyze, synthesize, evaluate and interpret information and ideas.
	
	1. Write in a style appropriate to the purpose and audience.
	2. Identify and write various kinds of writing.
	3. Plan and manage writing projects in terms of drafting, designing, revising and editing documents.
	4. Write collaboratively, providing peers with constructive feedback on their work.
	5. Develop effective style and tone, following businesses and technical writing guidelines. Analyze charts, graphs, specifications, diagrams, etc. and respond orally and in writing.
	6. Locate source materials in the library and on the internet, evaluating their usefulness, relevance, and credibility and then incorporate them into an assigned task with inline citations and full bibliography.
	7. Write well-organized essays with an introduction, a body and a conclusion to
	    Cause and Effect
	    Dividing and classifying
	    Process and Procedure
	8. Design visually effective documents (e.g. layouts, formatting, incorporating graphics and visuals into documents)
	9. Prepare and deliver an effective mixed media presentation.

CECE 1100	Engineering Graphics	3 Credit Hours
Co-requisites:	MATH 1100 & ITSE 1100	
Goal	To provide the students with the basic knowledge of engineering drawing, which enables him/her to produce high quality engineering drawings?	

Objectives	Outcomes
Part 1: Manual Drawing This course should enable the students to: 1. Understand the concept of engineering drawing 2. Produce Drawing using Drawing Equipment 3. Identify different types of engineering drawing 4. Understand sections, scales and dimensions. **Part II: Computer Aided Design** This course should enable the students to: 1. Understand the basic commands and tools used in producing technical engineering drawing. 2. Effectively and completely use computer aided design to produce accurate engineering drawing. 3. Understand how CAD is applied in industry.	**Part 1: Manual Drawing** A student who satisfactorily complete the course should be able to: 1. Produce an engineering drawing as a means of communication 2. Draw with dimensions to recognized scales 3. Differentiate between isometric, axonometric and prospective drawings 4. Read and analyze engineering, technical drawings 5. Produce work within time constraints **Part II: Computer Aided Design** A student who satisfactory complete the course should be able to: 1. Set a drawing environment 2. Make use of drawing helping software facilities 3. Draw simple objects 4. Modify existing drawing and draw to dimension and scale 5. Produce a complete hard copy of a technical engineering drawing with full details.

EECP 1290	Computer Programming For Engineering	3 Credit Hours
Prerequisites:	ITSE 1100	
Goal	To introduce the students to 'C' programming language and give them a brief introduction into the basics of UNIX. The course provides a good mix between theory and practice with terminals available for each candidate.	

Objectives

The course should enable the student to:

1. Become fluent in C

2. Understand abstract computer architecture

3. Develop good programming habits

4. Gain skills to transfer to advanced programming in C or other similar languages, like C++ or Java

5. Understand basic nature of the operating system functions and components

6. Describe names and basic nature of other popular operating systems including: MS DOS, OS/2 VAX VMS, and variations of MS Windows

7. Understand terminology and concepts of UNIX

8. Describe file naming conventions in UNIX

9. Organize files and understand file types, text file editing and formatting

Outcomes

The students should be able to:

1. Demonstrate knowledge of different levels of computer programming languages

2. Write a C program, compile it, link it, execute it and debug it

3. Define and initialize variables

4. Get data from input objects and store the data in output objects

5. Read files

6. Use branching (if-then-else) and case selections (switch) in C

7. Implement loop structures in C

8. Define and process an array of data elements

9. Write and use functions in C

10. Pass parameters to functions in C and return a value from a function

11. Use strings and libraries in C

12. Recognize a program written in C

13. Solve a simple real world problems by using programming in C

14. Identify and use UNIX utilities to create and manage simple file processing operations

15. Organize simple directory structures to allow easy file access and appropriate security

16. Utilize networking software to communicate with instructors and fellow students, research the Internet, and print, upload and download compressed and uncompressed archives and files

17. Identify and comprehend technical

	documentation
	18. Prepare simple readable user documentation
	19. Work well with peers in team situations including mentoring and peer reviews

EEPW 1240	Engineering Workshop	3 Credit Hours
Prerequisites:	None	

Goal	To equip the student with practical knowledge of elementary engineering tasks and provide him with progressive hands-on structured experience of environment and practices related to engineering
	To develop the students understanding of safety and its importance for the protection of personnel and equipment/ machinery.

Objectives

The course should enable the student to:

1. Know how to behave in workshop environment and grasp the principles underlying the work being done

2. Understand safety and observe safety measures for protection of personnel and equipment, and prevention of accidents including:

3. Personal safety clothing/equipment and it's use

4. Hazards and safety requirements for equipment/machinery

5. Fire safety, fire prevention and fire fighting

6. Identifying and reporting safety hazards

7. Accident prevention measures and responsibilities

8. Effectively use various measuring tools and instruments commonly used in engineering workshops

Outcomes

The students should be able to:

1. Be acquainted with normal workshop procedures and practices including bench work and marking

2. Be familiar with actual working conditions inside engineering workshops

3. Work with safety to self and the workplace, and contribute positively to safety environment of the workplace

4. Be familiar with workshop tools and machines available

Construction:

1. Apply the procedure of leveling in the field

2. Recognize the types of connections between pipes

3. Make a simple pipe network

4. Recognize the different sizes of reinforcement

5. Identify the purpose of vibrating concrete

6. Identify different types of wood

7. Create small project like a toolbox

8. Distinguish between good and bad concrete mixes

Electrical Department:

1. Apply assembly and installation operation

2. Apply wiring of lighting and power circuits in conduit systems

3. Apply testing of completed lighting and power circuits

Mechanical Department:

	1. Perform filing and bench work operations and know use of common workshop tools
	2. Be able to use common machines like Lathe, Bench Drill, Grinder, and do simple sheet metal cutting and bending
	3. Do simple electrical and gas welding tasks
	Practical / Lab work for safety training:
	1. Use of common personal safety clothing and equipment
	2. Inspecting a workplace from the safety perspective

ENTW1200 - Technical Writing II

ENTW1200	Technical Writing II	1 Credit
Prerequisites	ENTW 1100- Technical Writing I	
Goal	This course is a continuation of ENTW 1100. It aims at enabling the students to communicate effectively and appropriately in writing, based on real life situations. They will also have learned to process information, objectively and persuasively, making use of information and guidelines. They will use English for academic purposes and expository writing, as well as develop writing skills in an integrated manner, making use of the listening, reading and speaking skills.	

Objectives	Outcomes
1. Develop clear and accurate written and oral presentation of different tasks. 2. Promote critical thinking, continuous self- assessment and peer review. 3. Encourage independent research skills. 4. Prepare students for their professional environment. 5. Promote active learning and active participation of the students. 6. Provide extensive writing practice to students in order to meet their needs in various academic situations.	At the end of the course, students should be able to: 1. Analyze, synthesize, evaluate and interpret information and ideas. 2. Write in a style appropriate to the purpose and audience. 3. Identify and write various kinds of writing. 4. Plan and manage writing projects in terms of drafting, designing, revising and editing documents. 5. Write collaboratively, providing peers with constructive feedback on their work. 6. Develop effective style and tone, following businesses and technical writing guidelines. Analyze charts, graphs, specifications, diagrams, etc. and respond orally and in writing. 7. Locate source materials in the library and on the internet, evaluating their usefulness, relevance, and credibility and then incorporate them into an assigned task with inline citations and full bibliography. 8. Write well-organized essays with an introduction, a body and a conclusion to a. Cause and Effect b. Dividing and classifying

	c. Process and Procedure
	9. Design visually effective documents (e.g. layouts, formatting, incorporating graphics and visuals into documents)
	10. Prepare and deliver an effective mixed media presentation.

MATH 1200	Calculus I	3 Credit Hours
Prerequisites:	MATH 1100	
Goal	To equip the student with the basic techniques of calculus to solve problems in engineering and other applied fields.	

Objectives	Outcomes
This course should enable the student to: 1. Grasp the ideas of limits and continues functions. 2. Conceive the concepts of derivatives 3. Learn how to find anti-derivatives 4. Understand the techniques of applying derivatives and anti-derivatives to solve problems in realistic situation.	A student who satisfactory complete the course should be able to: 1. Determine if a function has a limit at point and find what its value. 2. Find solution to application problems involving continuous functions. 3. Determine has a limit at appoint and find the derivative. 4. Apply standard techniques such as a product and chain rules and differentiation of implicit functions. 5. Find solutions to applications problems involving derivatives including maximum and minimum problems and curve sketching. 6. Determine if a function has anti-derivative (i.e integral) 7. Establish the value of anti-derivatives. 8. Apply anti-derivative to application problems. 9. Deal with Rieman integral. 10. Appreciate the fundamental theorem of calculus. 11. Compute derivatives and integrals of some transcendental functions. 12. Find higher order derivatives. 13. Deal with problems involving extreme and optimization.

PHYS 1200	Physics I	3 Credit Hours
Prerequisites:	MATH 1100	
Goal	To equip the student with a strong understanding of the fundamentals of physics to enable him/her to apply such understanding to his/her studies.	

Objectives

This course should enable the student to:
1. Explain the behavior of the physical world around him/her by constructing a logical structure of it
2. Apply the concepts of physics in his/her field of study and everyday life
3. Relate the concepts of physics to the advancement of technology
4. Understand and relate the different phenomena in the world
5. Control the physical aspects of the world beneficially
6. Approach problems, predict their results in advance, and solve them in quantitative and qualitative manners
7. Gain a broader understanding of other sciences

Outcomes

Upon completion of the course, the student will be able to
1. Identify the use of S.I. system of measurement and how it is used in engineering
2. Recognize and manipulate the mathematical relationships between quantities
3. Plot technical graphs
4. Apply the basic principles of cosmology and astrophysics
5. Identify and describe the different types of materials and their uses
6. Define, analyze and experimentally demonstrate the electrical properties of matter
7. Apply and experimentally demonstrate the laws of elementary mechanics
8. Define and analyze objects/systems for work and energy and experimentally demonstrate work and energy
9. Define, apply and experimentally demonstrate the concepts of linear and angular momentum
10. Analyze systems/objects using the laws of conservation of energy and momentum
11. Define, apply and experimentally demonstrate the concepts of rotational motion
12. Define, analyze and experimentally demonstrate the concepts of oscillation
13. Define and apply the laws of gravitation
14. Define, apply and experimentally demonstrate the concepts of electric fields and forces
15. Define and apply the concepts of electrical currents
16. Construct circuits and analyze their electrical currents
17. Define, construct and analyze DC

	circuits
	18. Recognize and present real life examples of the aforementioned concept and interrelate some of them
	19. Describe the link between physics and other sciences
	20. Identify technological applications of some of the aforementioned concepts
	21. Describe how he/she can harness the benefits of some of the aforementioned concepts

BAMG2111 - Entrepreneurship

BAMG2111	Entrepreneurship	3 Credit Hours
Prerequisites	**None**	
Goal	**To introduce the student to entrepreneurship phenomenon**	

Objectives	Outcomes
The student will be exposed to the theory as well the experience associated with entrepreneurship. The course will cover such area as financial management and planning, legal regulation, concepts and tools in developing new venture, communication tools in small business.	The students should be able to: 1. Explain the vital role played by entrepreneurs and small business in the global economy. 2. Define entrepreneurship and describe how entrepreneurs are different from other business-people 3. Define small business and identify the industries in which most small firms are established 4. Compare the advantages and disadvantages of small business. 5. Analyze the small business opportunities for women and the special challenges faced by this entrepreneurs 6. Describe how the small business administration functions.

	7. Recognize the important contemporary topic such as family business, small business risks, and government regulations. 8. Recognize management process and operation management for the small firm. 9. Develop a working model of entrepreneurship by creating a small business plan.

PHYS 1210	Physics II	3 Credit Hours
Prerequisites:	PHYS 1200	
Goal	To equip the student with a strong understanding of the fundamentals of physics to extend his/her knowledge and to enable him/her to apply such understanding to his/her studies.	

Objectives

This course should enable the student to:
1. Explain the behavior of the physical world around him/her by constructing a logical structure of it
2. Apply the concepts of physics in his/her field of study and everyday life
3. Relate the concepts of physics to the advancement of technology
4. Understand and relate the different phenomena in the world
5. Control the physical aspects of the world beneficially
6. Approach problems, predict their results in advance, and solve them in quantitative and qualitative manners
7. Gain a broader understanding of other sciences

Outcomes

Upon completion of the course, the student will be able to
1. Define, analyze and experimentally demonstrate magnetic forces and fields
2. Define, construct and analyze LR, LC, and LCR circuits
3. Define and perform some basic applications of Maxwell's equations
4. Define, analyze and experimentally demonstrate the concept of sound, light and electromagnetic waves
5. Define, analyze and experimentally demonstrate geometrical optics
6. Define, analyze and experimentally demonstrate the concepts of heat
7. Define and analyze the concepts of thermodynamics
8. Define and apply the kinetic theory of gases
9. Define and apply the concepts of superposition and interference of waves
10. Define and apply the concepts of wave guides and optical fibers
11. Discuss some topics in modern physics
12. Recognize and present real life examples of the aforementioned concepts and interrelate some of them
13. Describe the link between physics and other sciences
14. Identify technological applications of some of the aforementioned concepts
15. Describe how he/she can harness the benefits of some of the aforementioned concepts