STUDENT GUIDE BOOK

Science and Medicine Foundation Programme UniSZA

Semester I Session 2023/2024

NAME : .... MATRIC NO :....................

TEACHING LECTURER ACADEMIC SESSION 2023/2024 (SEMESTER 1)
(UniSZA SCIENCE AND MEDICINE FOUNDATION CENTRE)

COURSES	LECTURERS	E-MAIL	NO. PHONE
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COURSE CONTENT

BIOLOGY

SUBJECT: BIOLOGY I

CONTENT SYNOPSIS:

This course is designed to expose students to basic knowledge and understanding of biology. Training in basic manipulative scientific skills will also be provided in carrying out experiments in biology. The major disciplines in biology covered in this course are the basic concepts and features of cells, genetics reproduction, development and growth. Active learning environment through direct involvement of students is encouraged. At the end of this course, the students will be able to apply basic biology concepts and principles to solve problems related to the study of molecules of life, cells, genetics, reproduction, human development and growth, follow instructions in conducting biology experiments and tasks using principles of biology as demonstrated by the instructors and demonstrate the ability to perform social communication, respect and self-confidence in group activity.

COURSE LEARNING OUTCOMES:

At the end of this course the students will be able to: -

CLO 1 : Apply basic biology concepts and principles to solve problems related to the study of molecules of life, cells, genetics, reproduction, human development and growth. (C3, PLO1)

CLO 2 : Display basic laboratory skills in the area of molecules of life, cell structure and function, transport across membrane, inheritance and pollen germination. (P3, PLO3)

CLO 3 : Demonstrate the ability to perform social communication, respect and self-confidence in group activity. (A3, PLO4)

LEARNING ACTIVITIES
1. Lectures
2. Tutorials
3. E-learning
4. Lab Practical
5. Group discussion

ASSESSMENT METHODS

Assessment Methods		Percentage (%)	
Formative	Mid Semester Test	20	50
	Assignment/Quiz/Presentation	10	
	Lab report	20	
Summative	Final examination	50	

OUTLINE OF COURSE CONTENT & LEARNING OUTCOMES

Week	Lecture	Lecturer	Topics	Learning Outcomes
1	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	**Introduction**	- Students able to introduce themselves and recognize PUSPA.
	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin	**1. Molecules of Life** - Water - Carbohydrate **Tutorial**	1. Explain the structure of the water molecule. 2. Describe: i. the properties of water and its molecule. ii. the various forms and classes of carbohydrates such as monosaccharaides, disaccharides and polysaccharides. iii. the formation and breakdown of maltose. iv. the structures and functions of starch. v. glycogen and cellulose.
2	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	- Nucleic acid **- Protein** **Tutorial**	1. Describe: a) the structure of nucleotide as the basic component of nucleic acid. b) the structure of DNA based on the Watson and Crick model. 2. State: a) the differences of DNA and RNA. b) the types and functions of RNA. 3. Describe: a) the basic structure of amino acids. b) the formation and breakdown of peptides. 4. Explain: a) how amino acids are grouped. b) the structure levels of proteins and types of bonds involved. c) the effects of pH and temperature on the structure of protein. 5. Classify proteins according to their structures.

	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin	- Lipid **Tutorial**	1. State the types of lipids: triglycerides (fats and oils), phospholipids and steroids.
				2. Describe:
				  a) the structure of fatty acids and glycerol.
				  b) the formation and breakdown of triglycerides.

3	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	**2. Cell Structure and Functions** - Prokaryotic and eukaryotic cell. - Structure and Functions: Cell Membrane and Organelles.	• State Cell theory. • Describe the structures of prokaryotic and eukaryotic cells. • Compare the structures of prokaryotic and eukaryotic cells • Illustrate the detailed structures of typical plant and animal cells
	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin	- Cells are grouped into tissues	Describe the following types of cells and tissues: a) Plant - meristem, parenchyma, collenchyma, sclerenchyma, xylem and phloem b) Animal - epithelial cells (simple squamous, simple cuboidal, simple columnar, stratified squamous), nerve cells, muscle cells (smooth, striated and cardiac), connective tissues (compact bone, hyaline cartilage and blood)
4	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	- Cell Transport **Tutorial**	Explain the various transport mechanisms across membranes a) Passive transport: simple diffusion, facilitated diffusion and osmosis b) Active transport: sodium potassium pump, endocytosis and exocytosis

	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin		**Tutorial**

5	Monday	Dr. Muhammad Yusran Abdul Aziz	**3. Cell Division**
			
			- The Concept of Cell Division
			- The Cell Cycle Mitosis
				1. State:
				  a) the importance of cell division in living organisms
				  b) the significance of mitosis
				2. Explain:
				  a) cell division
				  b) the stages in the cell cycle
				  c) the behavior of the chromosomes at each stage
				3. Describe:
				  a) the four stages of mitotic cell division
				  b) the cytokinesis processes
				4. Compare cell division in animals and plant

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	- Meiosis **Tutorial**	• State the significance of meiosis • Define chromatid, synapsis, bivalent tetrad, chiasma, crossing over and centromere • Explain and compare the processes in meiosis and meiosis • Explain the position and changes of the chromosomes at each stage • Compare meiosis and mitosis
6	Monday	Dr. Muhammad Yusran Abdul Aziz	**4. Genetic Inheritance** Mendelian Genetics: Monohybrid and Dihybrid Inheritance	• Define terminologies used in genetic inheritance • State Mendel's first law (law of segregation) • Describe the characteristics of Mendel's pea plants • Explain Mendel's experiments on monohybrid cross • Calculate the genotypic ratio (1:2:1) and phenotypic ratio (3:1) in F2 generation
	Tuesday	Dr. Muhammad Yusran Abdul Aziz	Mendelian Genetics: Monohybrid and Dihybrid Inheritance	1. State Mendel's second law (law of independent assortment) 1. Explain Mendel's experiments on dihybrid cross 2. Calculate:

				a) phenotypic ratio of test cross (1:1) b) genotypic ratio and phenotypic ratio (9:3:3:1) up to F2 generation using Punnett square c) phenotypic ratio of test cross (1:1:1:1)

7	Monday	Dr. Muhammad Yusran Abdul Aziz	- Deviation from Mendelian Inheritance
			
			- Genetic Mapping
				1. Explain:
				  a) codominant alleles
				  b) multiple alleles
				  c) incomplete dominant alleles
				  d) polygenes and polygenic inheritance
				  e) linked genes
				  f) sex-linked gene
				2. Describe the effects of linked genes with crossing over on the dihybrid test cross ratio
				3. Calculate:
				  a) genotypic and phenotypic ratios (1:2:1)
				  b) genotypic and phenotypic ratios (1:2:1)
				4. Calculate the genetic distance (map unit) between genes using the given recombination data
				5. Determine the position or order of genes along a chromosome based on recombination data

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	**Tutorial**	
8	Monday	Dr. Muhammad Yusran Abdul Aziz	**5. Population Genetics** - Gene pool concept	Explain population genetics gene pool allele frequency and genetic equilibrium
	Tuesday	Dr. Muhammad Yusran Abdul Aziz	- Hardy Weinberg Law - Tutorial **Tutorial**	• State the Hardy-Weinberg law • Explain five assumptions of Hardy Weinberg law for genetic equilibrium • Calculate allele and genotype frequencies

9	Mid Term Exam Week (24/09/2023 – 28/09/2023)			
	Mid Term Break (29/09/2023 – 07/10/2023)			

10	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	**6. Expression of Biological Information**
			
			- DNA and Genetic Information
			- DNA Replication
				• State the concept of Central Dogma
				• Describe semi-conservative replication of DNA
				• Explain:
				  a) DNA as the carrier of genetic information
				  b) the concept of one gene one polypeptide
				  c) the mechanism of DNA replication and the enzymes involve

	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin	- Protein Synthesis: Transcription and Translation	1. Give an overview of the roles of transcription and translation in the flow of genetic information
				2. State the formation of mRNA strand from 59 to 39
				3. Explain:
				  a) transcription
				  b) translation in protein synthesis
				4. Describe:
				  a) the stages involved in transcription
				  b) the stages involved in translation
				  c) the relationship between base sequences in codons with specific amino acids using genetic code table

11	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	- Gene Regulation and Expression - Lac Operon	Explain the concept of operon and gene regulation Describe: a) the components of the Lac Operon and their functions in E. coli b) the mechanism of the Lac Operon in the absence and presence of lactose
	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin		**Tutorial**

12	Monday	Mdm. Siti Noor Syuhada Muhammad Amin	**7. Mutation**
			
			- Mutation classification and types
			- Gene mutation
				1. Mutation
				 • Explain mutation
				 • Classify mutation
				    a) Gene/point mutation
				    b) Chromosomal mutation
				 • State the types of mutation
				    a) Spontaneous mutation
				    b) Induced mutation
				2. Mutagen
				 • Define mutagen
				 • State the types of mutagens
				    a) physical
				    b) chemical
				3. Gene mutation
				 • Explain gene/point mutation
				 • Classify gene mutation
				    a) Base substitution
				    b) Base insertion
				    c) Base deletion
				    d) Base inversion
				 • Describe base substitution as point mutation
				4. Frame shift mutation
				 • Explain frame shift mutation
				 • Describe base insertion as a frame shift mutation
				 • Describe base deletion as a frame shift mutation

	Tuesday	Mdm. Siti Noor Syuhada Muhammad Amin	- Chromosomal mutation
			
			Tutorial
				1. State the types of alteration:
				    a) Aneuploidy
				    b) Polyploidy
				2. Explain:
				  i. aneuploidy
				  ii. autosomal abnormalities and their effects:
				    a) Monosomy (monosomy 21)
				    b) Trisomy (Down syndrome / trisomy 21)
				  iii. sex chromosome abnormalities
				    a) Klinefelter s
				    b) Turner syndrome (45 XO)
				  iv. euploidy and polyploidy:
				    a) Autopolyploidy
				    b) Allopolyploidy

13	Monday	Dr. Muhammad Yusran Abdul Aziz	**8. Gene Technology**	• Define recombinant DNA technology • State the tools used in recombinant DNA technology

			• Recombinant DNA Technology	• Explain restriction enzyme and give examples of enzymes that produce sticky ends and blunt ends • List and explain the types of cloning vectors • Describe the characteristics of cloning vectors • Describe host cell (bacteria) and its characteristics • Define modifying enzyme and its function

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	- Methods in Gene Cloning
			- Application of Recombinant DNA Technology
			
			Tutorial
				• Describe the steps in gene cloning by using plasmid as the vector
				• Explain PCR (polymerase chain reaction)
				• Explain and give examples of recombinant DNA technology applications:
				  a) Agriculture
				  b) Production of insulin
				  c) Environment

	Monday	Dr. Muhammad Yusran Abdul Aziz	**9. Reproduction and Development**
			
			- Asexual Reproduction in Plants and Animals Sexual Reproduction in Flowering Plants
				• Explain the following terms and give examples of each:
				  a) Parthenogenesis
				  b) Sporulation
				  c) Budding
				  d) Binary fission
				  e) Regeneration
				  f) Vegetative
				• Give an overview of the typical life cycle of flowering plants
				• Describe:
				  a) the general structures and functions of reproductive organs in flowering plants
				  b) the development of a pollen grain and formation of male gametes
				  c) the development of an ovule, embryo sac and the formation of female gamete
				  d) the process of pollination
				• Explain double fertilization in the formation of a seed propagation (plant)

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	**Tutorial**	

15	Monday	Dr. Muhammad Yusran Abdul Aziz	- The Human Reproductive System	1. Describe the structure of
				  a) spermatozoa
				  b) secondary oocyte
				  c) female reproductive cycle (ovarian and uterine/menstrual cycle)
				2. Describe and explain the stages of
				  a) spermatogenesis
				  b) oogenesis
				3. Explain the role of hormones in
				  a) spermatogenesis
				  b) both cycles (ovarian and uterine / menstrual cycle)

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	**Tutorial**	

16	Monday	Dr. Muhammad Yusran Abdul Aziz	- Fertilization and Fetal Development	Explain:
				1. The stages that lead to fertilization
				  a) Capacitation
				  b) Acrosomal reaction
				  c) Fusion of sperm head to membrane and oocyte
				  d) Cortical reaction
				2. Embryogenesis and the developmental stages from a zygote to the formation of morula, blastocyst and gastrula through cleavage
				3. Organogenesis from germ layers to the formation of organs
				
				State fetal growth and development:1st, 2nd and 3rd trimester

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	- Roles of Hormones
			
			Tutorial
				Explain the role of hormones during:
				
				<u>A. Pregnancy</u>
				  a) Progesterone
				  b) Estrogen
				  c) Human chorionic gonadotrophin (HCG)
				<u>B. Parturition/birth</u>

				a) Progesterone
				b) Estrogen
				c) Oxytocin
				d) Prostaglandin
				C. Lactation
				    a) Oxytocin
				    b) Prolactin

17	Monday	Dr. Muhammad Yusran Abdul Aziz	**10. Growth**
			
			- Growth Phases
			- Measurement of Growth
			- Growth Patterns Growth Rate
				• Define growth
				• State the three phases of individual growth
				• Explain:
				  i. How growth is measured
				  ii. Sigmoid growth curve
				  iii. Human growth curve
				  iv. Limited growth curve (annual plants)
				  v. Unlimited growth curve (perennial plants)
				  vi. Isometric growth (fish)
				  vii. Allometric growth (human organs)
				  viii. Intermittent growth curve (arthropods)
				  ix. Absolute growth curve
				  x. Absolute growth rate curve

	Tuesday	Dr. Muhammad Yusran Abdul Aziz	**Tutorial**	
18	(03/12/2023 - 07/12/2023)		**Revision / E-Learning**	
	Revision Week (10/12/2023 - 16/12/2023)			
	Final Exam Week (17/12/2023 - 28/12/2023)			

OUTLINE OF COURSE CONTENT (PRACTICAL)

Lab	Week / Date	Tittle	Learning Outcomes
1	Week 3 (16/08/2023)	Food test: Test for carbohydrate, protein and lipid	1. Identify the category of different types of food that contain carbohydrates, proteins and lipid. 2. Identify the usage of each test to differentiate the types of macromolecules. 3. Describe the various forms and classes of macromolecules.
2	Week 6 (06/09/2023)	Cell Structure and Function	1. Identify the cell structures and their components. 2. Describe the function of cells components. 3. Compare the structures of prokaryotic cells and eukaryotic cells. 4. Illustrate the structures of plant and animal cells.
3	Week 10 (11/10/2023)	Transport Across Membrane	1. Define the osmotic pressure of a cell. 2. Describe the transport across membrane cell process. 3. Explain the haemolysis process in a red blood cell.
4	Week 13 (01/11/2023)	Inheritance	1. Define terminologies used in genetic inheritance. 2. Characterize inherited human genetic. 3. Differentiate between phenotype and genotype definition. 4. Explain the ABO blood group inheritance.
5	Week 16 (22/11/2023)	Pollen Germination	1. Describe how the germinating pollen grains occur. 2. Classify the germinated and ungerminated pollens. 3. Describe the general structures and formation of male gametes during pollen germination

TEXT BOOK

i.   Leong, L.S., Sudin, S., Kamaludin, A.R., Ching, L.S. and Nor Azlina, A.B. (2018). Biology for Matriculation Semester 1, 5th Edition. Oxford Fajar Sdn Bhd, Selangor.

REFERENCES

i.   Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V. and Jackson, R.B. (2014). Campbell Biology, 10th Edition. Pearson Education, USA.

ii.   Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V. and Reece, J.B. (2016). Campbell biology 11th edition. Pearson Education, USA.

iii.   Leong, L.S., Sudin, S., Rashid, K.A., Ching, Hoon, T.S., Aziz, N.A.A., Zakaria, F. and Hamzah, H. (2013). Q & A for Matriculation Biology Semester 1, 2nd Edition. Oxford Fajar Sdn Bhd, Selangor.

iv.   Solomon, E., Berg, L. and Martin, D. (2015). Biology, 10th Edition. Cengage Learning, USA

PHYSICS

SUBJECT: PHYSICS I

CONTENT SYNOPSIS :

This course is designed to enable students to learn the basic concepts and principles of elementary physics. The topics include mechanics, gravitation, states of matter, fluid, simple harmonic motion, waves, waves optics and sound. After completing this course, the students will be able to explain the basic concepts in physics and demonstrate numeracy proficiency to solve physics problems in mechanics, gravitation, states of matter and fluid and display basic laboratory skills in the areas of mechanics, gravitation, states of matter, fluid and waves optics to be implemented in laboratory work.

COURSE LEARNING OUTCOMES (CLO) :

At the end of this course the students will be able to :-

1. Explain the basic concepts in physics in mechanics, gravitation, states of matter, fluid, simple harmonic motion, waves, waves optics and sound. (C1, PLO1).

2. Demonstrate numeracy proficiency to solve physics problems in mechanics, gravitation, states of matter and fluid (A3, PLO7)

3. Display basic laboratory skills in the areas of mechanics, gravitation, states of matter, fluid and waves optics to be implemented in laboratory work (P3, PLO3)

LEARNING ACTIVITIES

1. Lectures
2. Lab Practical
3. Tutorials

ASSESSMENT METHODS

Assessment Methods		Percentage (%)	
Continuous/ Formative	Mid Semester test	20	50
	Assignments/Quizzes	10	
	Lab report	20	
Summative	End-of-semester Examination	50	

OUTLINE OF COURSE CONTENT (LECTURE)

Week	Lecture	Lecturer	Title	Learning Outcomes
1	**Physics 1 (2 hours)** **Sunday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	**MECHANIC** 1.1 Displacement, velocity, and angular acceleration (relation between circular motion and linear motion) 1.2 Circular motion under constant angular acceleration 1.3 Centripetal acceleration and centripetal force	• Define angular displacement, average angular velocity, instantaneous angular velocity, average angular acceleration, and instantaneous angular acceleration • Convert units between degrees, radians and revolution or rotation • To understand the relationship between linear and angular quantities. • Relate and use parameters in rotational motion with their corresponding quantities in linear motion. • Use equations for rotational motion with constant angular acceleration. • Define and use centripetal acceleration, $a_c = \frac{v^2}{r}$ • Define and solve problems on centripetal force, $F_c = m\frac{v^2}{r}$
	Physics 2 (1 hour) **Tuesday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz **Tutorial 1** K1, K2, K3		
2	**Physics 3 (2 hours)** **Sunday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	1.4 Motion on a curve – level and banked curves 1.5 Circular motion in a horizontal circle 1.6 Circular motion in a vertical circle. 1.7 Conical pendulum	• Understand the dynamics of circular motion. • Describe uniform circular motion in terms of change in the direction of velocity but not magnitude

	Physics 4 (1 hour) **Tuesday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz **Tutorial 2** K1, K2, K3		
3	**Physics 5 (2 hours)** **Sunday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	1.8 Centre of mass & torque 1.9 Moment of inertia and parallel axes theorem	● Define and use torque ● Understand the effect of the torque on an object ● State and use conditions for equilibrium of rigid body ● Understand the center of mass and how forces act. ● Explain the meaning and usefulness of the concept of center of mass ● Calculate the center of mass of a given system ● Define and use the moment of inertia of a rigid body about an axis, $I = \sum m_i r_i^2$
	Physics 6 (1 hour) **Tuesday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz **Tutorial 3** K1, K2, K3		
4	**Physics 7 (2 hours)** **Sunday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	1.10 Rotational kinetic energy 1.11 Angular momentum & conservation of angular momentum	● Express the rotational kinetic energy as a function of the angular velocity and the moment of inertia, and relate it to the total kinetic energy ● Understand angular momentum. ● Observe the relationship between torque and angular momentum. ● Apply the law of conservation of angular momentum.
	Physics 8 (1 hour) **Tuesday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz **Tutorial 4** K1, K2, K3		

5	**Physics 9 (2 hours)** **Sunday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	**C2: GRAVITATIONAL** 2.1 Newton's law of gravitation 2.2 Gravitational acceleration 2.3 Gravitational potential energy 2.4 Motion of satellites 2.5 Escape velocity	- State and use the Newton's law of gravitation $F = G\frac{Mm}{r^2}$ - Define and use gravitational acceleration, $a_g = G\frac{M}{r^2}$ - Define gravitational potential energy - Use the gravitational potential energy, $U = \frac{GMm}{r}$ - Derive and use equation for satellite motion, Velocity, $v = \sqrt{\frac{GM}{r}}$ Period, $T = 2\pi\sqrt{\frac{r^3}{GM}}$ - Derive and use excape velocity, $v_{esc} = \sqrt{\frac{GM}{R}} = \sqrt{2gR}$
	Physics 10 (1 hour) **Tuesday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz **Tutorial 5** K1, K2, K3		
6	**Physics 11 (2 hours)** **Sunday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	**C3: FLUID** 3.1 Hydrostatics: Buoyancy and Archimedes' principle 3.2 Hydrodynamics: Flow rate, continuity principle & Bernoulli's principle	- Define buoyant force - State Archimedes' principle - Understand why objects float or sink - Describe the relationship between density and Archimedes' principle. - Describe the characteristics of flow - Calculate flow rate. - Explain the consequences of the equation of continuity to the conservation of mass - Explain the terms in Bernoulli's equation. - Explain how Bernoulli's equation is related to the conservation of energy - Perform calculations using Bernoulli's principle - Describe some applications of Bernoulli's principle

	Physics 12 (1 hour) **Tuesday**	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz **Tutorial 4** K1, K2, K3		
7	**Physics 13 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	3.3 Poiseuille's law & viscosity 3.3 Stoke's law	• Define laminar flow and turbulent flow. • Explain what viscosity is. • Calculate flow and resistance with Poiseuille's law. • Explain how pressure drops due to resistance • Define and use Stoke's law • Able to calculate the viscosity of an unknown fluid using Stoke's Law.
	Physics 14 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 7** K1, K2, K3		
8	**Physics 15 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**C4: State of Matter** 4.1 Deformation of solids and elasticity 4.2 Stress, strain & Young's modulus	• Distinguish between elastic and plastic deformations. • Sketch and distinguish graph of force-elongation, F- e for elastic and ductile materials. • Define and use Young's modulus, $Y = \frac{\sigma}{\varepsilon}$

			● Sketch and interpret the graph of stress-strain, $\sigma - \varepsilon$ for a metal under tension ● Derive and use strain energy, U = $\frac{1}{2}Fe$
	Physics 16 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 8** K1, K2, K3	
9	**MID TERM TEST WEEK (24-28 Sept 2023)**		
	MID TERM BREAK (29 Sept-7 Oct 2023)		
10	**Physics 17 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	4.3 Hooke's law 4.4 Shear modulus and bulk modulus	● To study stress, strain, and elastic deformation. ● Define stress and strain for a stretched wire. ● Describe with examples the shear modulus and bulk modulus. ● Able to calculate the three types of deformations: changes in sideways shear, and changes in volume
	Physics 18 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 9** K1, K2, K3	

11	**Physics 19 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**C5: Simple Harmonic Motion** 5.1 Kinematics of simple harmonic motion in spring and simple pendulum 5.2 Energy in simple harmonic motion. 5.3 Damped and forced oscillations & resonance	● Explain S.H.M is a periodic motion without loss of energy ● Use S.H.M equation ● Derive and apply equations for kinetic energy and potential energy in spring and simple pendulum. ● Observe amplitude of a damped harmonic oscillator. ● Application to equation of oscillating spring with damping and driving term; resonance.
	Physics 20 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 10** K1, K2, K3		
12	**Physics 21 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**C6 Waves** 6.1 Properties and types of waves 6.2 Propagation of wave on a stretched string & progressive wave 7.2 Stationary waves 6.3 Huygens' principle & superposition principle	● Define amplitude, frequency, period, wavelength and wave number. ● Interpret and use the progressive wave equation ● Explain the formation of stationary wave ● Use the stationary wave equation, $y = A \cos \cos kx \sin \sin \omega t$ ● Distinguish between progressive and stationary waves. ● State the principle of superposition of waves and use it to explain constructive and destructive interference

	Physics 22 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 10** K1, K2, K3		
13	**Physics 23 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**C7 Waves optics** 7.1 Constructive and destructive interference 7.3 Single slit diffraction & diffraction grating	• To see that waves will interfere (add constructively and destructively). • Define diffraction • Explain with the aid of diagram the formation of diffraction (Apply d sin θ = $n\lambda$)
	Physics 24 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 12** K1, K2, K3		
14	**Physics 25 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	7.4 Light interference: Young's double slit experiment 7.5 Newton's ring & interference in thin films	• State conditions for constructive and destructive interferences • Derive and use formula for bright and dark fringes • Use $\Delta y = \frac{\lambda D}{d}$ and explain the effect of changing any variables • Define coherence • State conditions for interference • Identify the phase change upon reflection

				- Explain with the aid of diagram the interference of light in thin films - Use equation for constructive and destructive interference for reflected light with - No phase difference - π rad phase difference - Use formula for bright and dark fringes for single slit
	Physics 26 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 13** K1, K2, K3		
15	**Physics 27 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	7.6 Polarisation: Malus' law & Brewster's law	- Explain the change in intensity as polarized light passes through a polarizing filter - Understanding Malus's Law for transmitted intensity of light from a polarising filter. - Apply Malus's Law for transmitted intensity of light from a polarising filter. - Calculate the effect of polarization by reflection and Brewster's angle - Describe the effect of polarization by scattering
	Physics 28 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 14** K1, K2, K3		
16	**Physics 29 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**C8 Waves optics** 8.1 Sound wave properties & speed of sound 8.2 Intensity & sound level (decibel scale)	- Understanding sound wave. - Relate the relationship between the speed of sound, its frequency, and its wavelength.

		8.3 Resonance: sound waves in pipe column (closed pipe)	● To study sound intensity. ● Define antinode, node, fundamental, overtones, and harmonics. ● Describe how sound interference occurring inside closed tubes changes the characteristics of the sound, and how this applies to sounds produced by musical instruments.
	Physics 30 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 15** K1, K2, K3	
17	**Physics 31 (2 hours)** **Sunday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	8.4 Resonance: sound waves in pipe column (open pipe) 8.5 Doppler effect	● Describe how sound interference occurring inside open tubes changes the characteristics of the sound, and how this applies to sounds produced by musical instruments. ● Calculate the length of a tube using sound wave measurements. ● To solve for frequency shifts (Doppler Effect)
	Physics 32 (1 hour) **Tuesday**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff **Tutorial 16** K1, K2, K3	
18	3-7/12/2023	**Revision/ E-Learning**	
STUDY WEEK (10 Dec-16 Dec 2023)			
FINAL EXAM (17 Dec – 28 Dec 2023)			

OUTLINE OF COURSE CONTENT (PRACTICAL)

WEEK	PRACTICAL	LECTURER	TITLE	LEARNING OUTCOMES
4	Practical 1	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	**Torque**	1. Measure torque as a function of the distance between the origin of the coordinates and the point of action of the force. 2. Determine the torque as a function of the angle between the force and the position vector to the point of action of the force. 3. Analyze torque as a function of the force.
7	Practical 2	Dr. Nurulhuda Mohammad Yusoff Dr. Siti Maisarah Aziz	**Newton's 2nd Law : Air Track**	1. Verify Newton's Second Law, F = ma 2. Analyze situations in which an object moves with specified acceleration under the influence of one or more forces. 3. Determine the magnitude and direction of the net force, or of one of the forces that makes up the net force.
11	Practical 3	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**Hooke's Law**	1. Define the Hooke's law and elasticity. 2. Explain the relationship of force, mass and elongation.

14	**Practical 4**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**Interference of Light**	1. Define moment as a combination of a physical quantity and a distance. 2. Explain moment is the product of the force multiplied by the perpendicular distance from the line of action of the force to the pivot or point where the object will turn.
17	**Practical 5**	Dr. Siti Maisarah Aziz Dr. Nurulhuda Mohammad Yusoff	**Archimedes Principle**	**1.** Investigate the buoyant force acting on a variety of objects. **2.** Calculate the density of the objects.

REFERENCES

i.   David H., Jearl W. & Robert R. (2013). Fundamental of Physics, (10th ed.). John Wiley & Sons Inc, New York, United States

ii.   Rama B., Jothilakshmi R., Balasubramanian E. (2014). University Physics, Narosa Publishing House Pvt. Ltd., New Delhi

iii. David S., Graham J., Gurinder C., Richard W. (2014). Cambridge International AS and A level Physics Coursebook, (2nd ed.). Cambridge University Press

iv.   Serway, S. A. & Vuille, S. (2015). College physics (10th ed.). Cengage Learning.

v.   Halliday, D. A., Resnick, R. & Walker, J. (2014). Fundamentals of physics (10th ed.). Wiley.

vi.   Young, H. D. & Freedman, R. A. (2015). University physics with modern physics (14th ed.). Addison Wesley.

CHEMISTRY

SUBJECT: CHEMISTRY I

CONTENT SYNOPSIS:

This course is designed to provide the essential foundations of chemistry to prepare students for higher studies where chemistry or chemistry-related subjects are taught. Students will be exposed to a thorough introduction to physical and inorganic chemistry, scientific methods, and the development of skills relevant to the safe practice of science. Coverage of this course includes stoichiometry, atomic structure, the periodic table, chemical bonding, chemical kinetics, chemical equilibrium, states of matter, and acid and bases. At the end of this course, the students should be able to apply the concept of principles, chemical bonding, and reactions in physical and inorganic chemistry to solve problems, present chemistry-related problems or phenomena using digital appropriate digital software, and display basic laboratory skills in performing physical and inorganic chemistry experiments.

COURSE LEARNING OUTCOMES (CLO):

At the end of this course, students should be able to:

CLO1 :   Apply the concept of principles, chemical bonding and reactions in physical and inorganic chemistry. **(C3, PLO1)**

CLO2 :   Present chemistry-related problems or phenomena using digital appropriate digital software. **(A2, PLO6)**

CLO3 :   Display basic laboratory skills in the areas of physical and inorganic chemistry to be implemented in laboratory works. **(P3, PLO3)**

LEARNING ACTIVITIES

1.   Lectures
2.   Tutorials
3.   E-learning
4.   Lab Practical

ASSESSMENT METHODS

Assessment Methods		Percentage (%)	
Continuous/ Formative	Mid Semester Test	20	50
	Video Project	10	
	Lab Report	20	
Summative	Final Examination	50	
TOTAL		**100**	

OUTLINE OF COURSE CONTENT (LECTURES)

Week	Lecture	Lecturer	Topic	Learning Outcomes
1	30/7/2023 – 5/8/2023	**Lecture 1** Dr. Nurul Najidah Mohamed	**Stoichiometry** i. Proton number, nucleon number, isotopes, Avogadro number ii. Relative atomic mass	• To define and explain the Avogadro number and mole concept and formula mass index • To define and describe the relative mass of atoms and molecules
		Lecture 2 Dr. Nurul Najidah Mohamed	iii. Composition (%) of compounds with the empirical and molecular formula	• To describe the formula mass and molecular mass
2	6/8/2023 – 12/8/2023	**Lecture 3** Dr. Nurul Najidah Mohamed	iv. Concentration of solution v. Limiting reagent and application to stoichiometric calculations	• To explain the reacting masses and volume of reaction • To determine the limiting reagent according to stoichiometric calculations
		Lecture 4 Dr. Nurul Najidah Mohamed	Tutorial	
3	13/8/2023 – 19/8/2023	**Lecture 5** Dr. Nurul Najidah Mohamed	**Structure of Atoms** i. Electronic energy levels and Bohr's Theory of the hydrogen atom ii. Atomic orbital and quantum numbers **Remarks**: Video Project	• To define and describe the electronic energy levels, Bohr model of hydrogen atom • To describe the quantum numbers and shape of atomic orbital
		Lecture 6 Dr. Nurul Najidah Mohamed	Continue	

4	20/8/2023 – 26/8/2023	**Lecture 7** Dr. Nurul Najidah Mohamed	iii. Electronic configurations of elements iv. Rules of the electronic configuration and the arrangement of elements in the Periodic Table	• To explain the electronic configurations and the arrangement of elements in the periodic table
		Lecture 8 Dr. Nurul Najidah Mohamed	Tutorial	
5	27/8/2023 – 2/9/2023 National Day **31/8/2023 (Thursday)**	**Lecture 9** Dr. Nurul Najidah Mohamed	**Periodic Table** i. Periodic law, periodic patterns in the main group elements ii. Periodic properties of the Period 3 elements iii. Properties of Group 2, 14, and 17 elements	• To define and describe the Periodic Law, periodic patterns in the main group elements • To describe the periodic properties of the group 3 • To describe the properties of group 2, 14 and 17
		Lecture 10 Dr. Nurul Najidah Mohamed	iv. Chemistry of first row d-block elements **Remarks**: E-learning	• To explain the chemistry of first row d-block elements
6	3/9/2023 – 9/9/2023	**Lecture 11** Dr. Nurul Najidah Mohamed	Tutorial	
		Lecture 12 Dr. Nurul Najidah Mohamed	**Chemical bonding** i. Lewis dot symbol ii. Chemical bonding; ionic, covalent, and metallic bonding	• To draw the Lewis dot symbols • To describe the electrons in molecules, ionic bonds, covalent bonds and metallic bonds

7	10/9/2023 – 16/9/2023 Malaysia Day **16/9/2023 (Saturday)**	**Lecture 13** Dr. Nurul Najidah Mohamed	iii. Intermolecular bonding iv. Writing Lewis structure	• To explain the intermolecular forces and hydrogen bonding
		Lecture 14 Dr. Nurul Najidah Mohamed	Tutorial	
8	17/9/2023 – 23/9/2023	**Lecture 15** Dr. Nurul Najidah Mohamed	v. Molecular shape and polarity vi. Orbital overlap and hybridization	• To describe the molecular shape, VSEPR theory, hybridization, resonance
		Lecture 16 Dr. Nurul Najidah Mohamed	Tutorial	
9	**MID SEMESTER TEST (24 – 28 SEPTEMBER 2023)**			
	MID SEMESTER BREAK (29 SEPTEMBER – 7 OCTOBER 2023)			
10	8/10/2023 – 14/10/2023	**Lecture 17** Dr. Salmiah Jamal Mat Rosid	**Chemical Kinetic** i. Rate of reaction ii. Rate laws iii. Relation between reactant concentration and time	• Define chemical reaction rate. • Explain the graph of concentration against time in relationship to reaction rate. • Write differential rate equation. • Determine reaction rate based on differential rate equation of a reaction • Define rate law, order of reaction and half-life.
		Lecture 18 Dr. Salmiah Jamal Mat Rosid	Tutorial	

11	15/10/2023 – 21/10/2023	**Lecture 19** Dr. Salmiah Jamal Mat Rosid	iv. Activation energy and temperature dependence of rate constant v. Catalysis;heterogeneous catalyst, homogeneous catalyst, and enzymes	• Define activation energy • Explain the transition state theory • Explain on the effect of concentration (pressure), temperature, catalyst and particle size on the reaction rate. • Explain the effect of temperature on reaction rate using Maxwell-Boltzmann distribution curve. • Explain the effect of catalyst on activation energy using an energy profile diagram. • Define the Arrhenius equation. • Relate temperature and activation energy to the rate constant based on the Arrhenius equation. • Determine k, Ea and A using Arrhenius equation by calculation and graphical method.
		Lecture 20 Dr. Salmiah Jamal Mat Rosid	Tutorial	
12	22/10/2023 – 28/10/2023	**Lecture 21** Dr. Salmiah Jamal Mat Rosid	**Chemical Equilibrium** i. Concept of dynamic equilibrium and equilibrium constant ii. Writing expression of the equilibrium constant iii. Direction of reaction iii. Factors affecting chemical equilibrium, Le Chatelier's principle, and its applications **Remarks:** Submission video project	• Explain the concept of dynamic equilibrium and equilibrium constant. • Describe the calculation value of Kp. • Explain the calculation of Kc and Kp for heterogeneous equilibria. • Explain the relationship of Kp with Kc for homogenous and heterogeneous system. • Explain the principle of Le Chatelier's.

		Lecture 22 Dr. Salmiah Jamal Mat Rosid	Continue **Remarks**: E-learning	
13	29/10/2023 – 4/11/2023	**Lecture 23** Dr. Salmiah Jamal Mat Rosid	Tutorial	

		Lecture 24
		Dr. Salmiah Jamal Mat Rosid
			The States of Matter
			
			  i. Solid
			  ii. Liquid
				• Explain the properties of liquid.
				• Explain the solubility, mass of solute, molarity and molality of solution.
				• Define vapour pressure and boiling point.
				• Explain the relationship between intermolecular forces and vapour pressure; and vapour pressure and boiling point
				• Explain the process of freezing, melting, sublimation and deposition
				• Explain the fixed shape of a solid.
				• Differentiate between amorphous and crystalline solids
				Explain allotropes (sulphur, phosphorus and carbon

14	5/11/2023 – 11/11/2023	**Lecture 25** Dr. Salmiah Jamal Mat Rosid	Continue	
		Lecture 26 Dr. Salmiah Jamal Mat Rosid	Tutorial	

15	12/11/2023 – 18/11/2023 Deepavali **12/11/2023 (Sunday)**	**Lecture 27** Dr. Salmiah Jamal Mat Rosid	iii. Gas iv. Phase diagram	• Explain the gas laws (Boyle's law, Charles's law and Avogadro's law). • Explain the ideal gas equation. • Explain the kinetic molecular theory of gases. • Explain the Dalton's law and Maxwell-Boltzmann distribution. • Explain the ideal and non-ideal behaviour of gases in terms of intermolecular forces and perform calculations using Dalton's law. • Explain the conditions at which real gases approach the ideal behaviour. • Explain the phase diagram, triple point and critical point.
		Lecture 28 Dr. Salmiah Jamal Mat Rosid	Tutorial	
16	19/11/2023 – 25/11/2023	**Lecture 29** Dr. Salmiah Jamal Mat Rosid	**Acid and Bases** i. Theory of acids, and bases (Arrhenius, Lewis, Bronsted-Lowry) ii. Conjugate acid-base pair	• Explain Acid-Base theories (Arrhenius, Bronsted-Lowry and Lewis theories). • Deduce conjugate acid and conjugate base according to Bronsted-Lowry theory.
		Lecture 30 Dr. Salmiah Jamal Mat Rosid	Continue	

17	26/11/2023 – 2/12/2023	**Lecture 31** Dr. Salmiah Jamal Mat Rosid	iii. Strengths of acids and bases iv. The terminology of pH, pOH, Kw, Ka, and Kb and application in calculations	• Define strong acid, strong base, weak acid, weak base, pH and pOH. • Explain the calculation of pH value of a strong acid and strong base. • Explain the relationship between strength of weak acid and weak base to the respective dissociation constants, Ka and Kb.
		Lecture 32 Dr. Salmiah Jamal Mat Rosid	Tutorial	
18	3/12/2023 – 9/12/2023	**Lecture 33** Dr. Salmiah Jamal Mat Rosid	v. The terminology of pH, pOH, Kw, Ka, and Kb and application in calculations vi. Buffer solution vii. Solubility product	• Define buffer solutions. • Describe how buffer solutions control its pH. • Explain the Henderson-Hasselbalch equation. • Define solubility, molar solubility and solubility product, Ksp. • Explain the calculation of Ksp from concentrations of ions and vice versa. • Predict the possibility of precipitation by comparing value of ion-product, Q to Ksp.
		Lecture 34 Dr. Salmiah Jamal Mat Rosid	Tutorial	
19	**STUDY WEEK (10 – 16 DECEMBER 2023)**			
20-21	**FINAL EXAMINATION (17 – 28 DECEMBER 2023)**			

OUTLINE OF COURSE CONTENT (PRACTICAL)

Week	Practical	Title	Learning Outcomes
2	Practical 1	Basic Techniques of Handling Chemicals and Laboratory Apparatus **Remarks**: Submit datasheet	• To understand and abide laboratory safety rules and regulations • To acquire the correct techniques of handling laboratory apparatus
5	Practical 2	Determination of the Formula Unit of a Compound **Remarks**: Submit lab report (individual)	• To synthesize zinc chloride compound • To determine the formula unit of zinc chloride
8	Practical 3	Factors affecting the rate of a chemical reaction. **Remarks**: Submit datasheet	• Demonstrate the rate of reaction of the elements. • Determine the average rate of reaction.
9		Lab Test: Factors affecting the rate of a chemical reaction.	
12	Practical 4	Chemical equilibria and Le Chatelier's principle **Remarks**: Submit lab report (group)	• Demonstrate the rate of reaction of the elements. • Determine the average rate of reaction.
15	Practical 5	Acid and bases **Remarks**: Submit datasheet	• Demonstrate the basic laboratory technique of titration. • Calculate molarity based on titrations.

MAIN REFERENCES SUPPORTING THE COURSE

i.   Silberberg, M. & Amateis, P. (2021). Chemistry: The Molecular Nature of Matter and Change. 9th edition. McGraw-Hill, New York.

ADDITIONAL REFERENCES SUPPORTING THE COURSE

i.   Tan. Y.T. & Shanmuganathan, S. (2016). Chemistry for Matriculation Semester 1. 5th edition. Oxford Fajar Sdn. Bhd. Selangor Darul Ehsan.

ii.   Chang, R. & Overby, J. S. (2011). General Chemistry. The Essential Concepts. 6th edition. McGraw-Hill, New York.

iii. Timberlake, K.C. & Orgill M. K. (2019). Chemistry: An Introduction to General, Organic, and Biological Chemistry. 13th Global edition. Pearson, New York.

iv.   Petrucci, R.H., Herring, G.E., Madurra, J. D. & Bissonnette, C. (2017). General Chemistry: Principles and Modern Applications. 11th edition. Pearson, New York.

v.   Timberlake, K.C. (2014). Laboratory Manual for General, Organic and Biological Chemistry. 3rd edition. Pearson, Unite Stated of America.

vi.   Gerald, W. (2013). Experiments in General Chemistry. 9th edition. Pearson, New York.

SUBJECT: MATHEMATICS I

CONTENT SYNOPSIS:

This is an introductory course in Mathematics. This course is designed to provide basic knowledge of mathematical concepts, terminology and notation involving geometry, algebra and trigonometry. The topics covered include Number System, Complex Numbers, Polynomials, Inequalities, Sequences and Series, Functions and Graphs, Trigonometry, Conic Sections, Matrices and Vectors. This foundation enables the students to further develop the understanding of mathematical concepts, mathematical thinking and acquire skills in problem solving and the applications of mathematics.

COURSE LEARNING OUTCOMES (CLO):

At the end of this course the students will be able to:-

1. Solve basic mathematical concepts involving geometry, algebra and trigonometry. (C2, PLO1)

2. Perform in group to solve mathematical problems. (A2, PLO4)

3. Demonstrate numeracy proficiency through mathematical approach. (A3, PLO7)

LEARNING ACTIVITIES

1. Lectures
2. Tutorials
3. Group Work/Assignment
4. Classroom activities (games/creative presentation)

ASSESSMENT METHODS

Assessment Methods	Types	Percentage (%)	
Continous/Formative	Mid-Exam	20	50
	Quizes/Assignments	30	
Summative	Final Examination	50	

OUTLINE OF COURSE CONTENT (LECTURES)

Week	Lecture	Lecturer	Chapter/Topic	Learning Outcomes
1 **30 Jul - 3 Aug 2023**	**Lecture 1** **Tutorial 1 and 2**	Mdm Aida Othman	**Chapter 1: Number System** 1.1 Introduction to Real Numbers 1.2 Rational and Irrational Numbers	1. Define natural number (N), whole numbers (W), integers (Z), prime numbers, rational numbers (Q) and irrational numbers ($\overline{Q}$) 2. Represent rational and irrational numbers in decimal form 3. Represent the relationship of number sets in a real number system diagrammatically 4. Understand open, closed and half-open intervals and their representations on the number line. 5. Simplify union, $\cup$, and intersection, $\cap$, of two or more intervals with the aid of the number line.
2 **6 – 10 Aug 2023**	**Lecture 2** **Tutorial 3 and 4**	Mdm Aida Othman	**Chapter 1: Number System** 1.3 Indices(exponent) 1.4 Surds 1.5 Logarithms	6. State the rules of indices 7. Explain the meaning of a surd and its conjugate and carry out algebraic operations on surds 8. State the laws of logarithms 9. Change the base of logarithms
3 **13 – 17 Aug 2023**	**Lecture 3** **Tutorial 4 and 5**	Mdm Aida Othman	**Chapter 2: Complex Numbers** 2.1 The idea of a complex number (real part, imaginary part, modulus argument and conjugate) 2.2 Equality of two complex numbers 2.3 Operations of two complex numbers	1. Represent a complex number in Cartesian form 2. Perform algebraic operations on complex number (addition and subtraction)

4 20 – 24 Aug 2023	Lecture 4 Tutorial 6 and 7	Mdm Aida Othman	**Chapter 2: Complex Numbers** 2.4 Representation of complex numbers in Argand diagram 2.5 Multiplication and division of two complex numbers in polar form 2.6 The two square roots of a complex 2.7 Representation of complex numbers in polar form	3. Sketch an argand diagram for a complex number 4. Perform algebraic operations on complex number (multiplication and division) 5. Determine the conjugate of a complex number 6. Define the equality of two complex numbers 7. Represent a complex number in polar form $z = r(\cos\theta + i\sin\theta)$ where $r > 0$
5 27 – 31 Aug 2023	Lecture 5 Tutorial 8 and 10	Dr Siti Norziahidayu Amzee Zamri	**Chapter 3:** **Equations and Inequalities** 3.1 Linear, Quadratic and Rational Expression 3.2 Critical Value Technique 3.3 Absolute Value	1. Solve linear equations using the equality and properties. 2. Solve quadratic equations by using factorization or quadratic formula 3. Solve inequalities using the inequality properties 4. Solve rational inequalities involving linear expression. 5. Solve quadratic inequalities by algebraic or graphical approach 6. Use the properties of absolute value 7. Solve absolute equations 8. Solve absolute inequalities
6 3 – 7 Sep 2023	Lecture 6 Tutorial 11 and 12	Dr Siti Norziahidayu Amzee Zamri	**Chapter 4:** **Functions and Graphs** 4.1 Definition of Functions 4.2 Types of Functions 4.3 Composite Functions	1. Define a function 2. State the domain and range of a function 3. Sketch the graph of a function 4. Represent a composite function by an arrow diagram 5. Find composite functions 6. Find one of the functions when the composite and the other functions are given

7 10 – 14 Sep 2023	Lecture 7 Tutorial 13 and 14	Dr Siti Norziahidayu Amzee Zamri	**Chapter 4: Functions and Graphs** 4.4 Exponential and Logarithmic Functions 4.5 Inverse Functions	7. Find the domain and range of exponential functions 8. Sketch the graph involving exponential functions 9. Find the domain and range of logarithmic functions 10. Sketch the graph involving logarithmic functions 11. Determine the inverse of a function 12. Determine whether a function has an inverse and find the inverse of the function 13. Identify the domain and range of an inverse function
8 17 – 21 Sep 2023	Lecture 8 Tutorial 15 and 16	Dr Siti Norziahidayu Amzee Zamri	**Chapter 5: Polynomial Functions** 5.1 Addition, Subtraction and Multiplication of Polynomials 5.2 Long Division 5.3 Remainder Theorem, Factor Theorem and Zeros of Polynomials 5.4 Partial Fractions	1. Perform addition, subtraction and multiplication of polynomials 2. Perform division of polynomials and write the answer in the form $P(x) = Q(x)D(x) + R(x)$ 3. Apply the remainder and factor theorems to solve problems 4. Find the roots of the equation and the zeros of a polynomial 5. Transform the rational polynomials when the degree of the numerator is the same or more than that of the denominator into proper fractions and then determine the partial fractions 6. Perform partial fractions decomposition when the denominators are in the form of (a) a linear factor, $ax + b$ (b) a quadratic factor, $ax^2 + bx + c$ that cannot be factorized, (c) a repeated linear factor, $(ax + b)^n$
9			**MID SEMESTER TEST (24 – 28 September 2023)**	
			MID SEMESTER BREAK (29 September – 7 October 2023)	
10	Lecture 9	Mdm Aida Othman	**Chapter 6: Sequence and Series**	1. Write the nth term of simple sequences and series

8 – 12 Oct 2023	Tutorial 17 and 18 Lecture 10 Tutorial 19 and 20		6.1 Terms and Sum of Arithmetic 6.2 Geometric Series	2. Determine the nth term of arithmetic sequences $T_n = a + (n-1)d$ and series and use the sum formula, $S_n = \frac{n}{2}\left[2a + (n-1)d\right]$ or $S_n = \frac{n}{2}(a + l)$ 3. Determine the nth term of geometric sequences and series, $T_n = ar^{n-1}$ and use the sum formula, $S_n = \frac{a(1 - r^n)}{1 - r}$ for $r \neq 1$ 4. Use the sum formula for infinite geometric series, $S_\infty = \frac{a}{1 - r}, \left|r\right| < 1$
11 **15 – 19 Oct 2023**	**Lecture 11** **Tutorial 21 and 22**	Mdm Aida Othman	**Chapter 6: Sequence and Series** 6.3 Application of Arithmetic and Geometric Series 6.4 Application of Binomial Expansion	5. Apply arithmetic or geometric series in solving daily life problems accordingly. 6. Expand $(a + x)^n$ where n is a positive integer 7. Write $n!$ notation and ${}^nC_r = \begin{pmatrix} n \\ r \end{pmatrix}$ as a binomial coefficient 8. Determine the general term in a binomial expansion $(a + x)^n$ where n is a positive integer. 9. Expand $(1 + x)^n$ for $\left|x\right| < 1$ where n is a rational number, and determine the valid interval for the binomial expansion.
12 **22 – 26 Oct 2023**	**Lecture 12** **Tutorial 23 and 24**	Mdm Aida Othman	**Chapter 7: Trigonometry** 7.1 Trigonometric Ratios and Identities	1. State trigonometric ratios 2. Use $\tan\theta = \frac{\sin\theta}{\cos\theta}$, $\sin(90^o - \theta) = \cos\theta$, $\cos(90^o - \theta) = \sin\theta$, $\tan(90^o - \theta) = \cot\theta$ 3. Use some special angles 4. Evaluate trigonometric functions for any angle

				5. Use the Pythagorean identities
13 **29 Oct – 2 Nov 2023**	**Lecture 13** **Tutorial 25 and 26**	Mdm Aida Othman	**Chapter 7: Trigonometry** 7.2 Compound Angle 7.3 Solutions of Trigonometric Equations	6. Use the formulae sin (A±B), cos (A±B) and tan (A±B) 7. Use the double-angle formulae 8. Use the factor formulae 9. Solve equations such as $\sin\theta = k$, $\cos\theta = k$ and $\tan\theta = k$ 10. Solve equations in quadratic form 11. Express sin θ, cos θ and tan θ in terms of t and solve $a\cos\theta + b\sin\theta = c$, where $t = \tan\dfrac{\theta}{2}$ 12. Express $a\cos\theta \pm b\sin\theta$ in the form of $R\cos(\theta \mp \alpha)$ or $R\sin(\theta \pm \alpha)$ and solve $a\cos\theta \pm b\sin\theta = c$
14 **5 - 9 Nov 2023**	**Lecture 14** **Tutorial 27 and 28**	Mdm Aida Othman	**Chapter 8: Conic Sections** 8.1 Circles 8.2 Ellipses 8.3 Parabolas	1. Determine the equation of a circle 2. Determine the center and radius of a circle 3. Find the points of intersection of two circles, and a circle and a line 4. Find the equation of tangents and normal to a circle 5. Find the length of a tangent from a point to a circle 6. Determine the equation of an ellipse with center (h,k) and foci (h ± c, k)or (h, k ± c) 7. Determine all the vertices, foci, major and minor axes 8. Determine the center and foci of an ellipse by completing the square 9. Determine the equation of a parabola with vertex (h, k) and focus (h + p, k) or (h, k+ p) 10. Determine the vertex, focus and directrix of a parabola by completing the square
15	**Lecture 15**	Dr Siti Norziahidayu Amzee Zamri	**Chapter 9: Matrices**	1. Identify the different types of matrices such as row, column,

12 - 16 Nov 2023	Tutorial 29 and 30		9.1 Type and properties of Matrices
			9.2 Determinant of Matrices
			9.3 Inverse of Matrices
				zero, diagonal, upper triangular, lower triangular and identity matrices
				2. Perform operations on matrices such as addition, subtraction, scalar multiplication and multiplication of two matrices
				3. Transpose a matrix and solve related problem
				4. Find the minors and cofactors of a matrix
				5. Find the determinant of a matrix
				6. Find the inverse of a non-singular matrix using
				   i) adjoint matrix
				   ii) elementary row operations

16 19 – 23 Nov 2023	Lecture 16 Tutorial 31 and 32	Dr Siti Norziahidayu Amzee Zamri	**Chapter 9: Matrices** 9.4 Systems of Linear Equations with Three Variables 9.5 Systems of Linear Equations with Three Variables 9.6 Systems of Linear Equations with Three Variables	7. Write a system of linear equations in the form of $AX = B$ 8. Find the unique solution to $AX = B$ using i) inverse matrix ii) Gauss-Jordan elimination method 9. Problems involving the use of matrix equation
17 26 – 30 Nov 2023	Lecture 17 Tutorial 33 and 34	Dr Siti Norziahidayu Amzee Zamri	**Chapter 10: Vectors** 10.1 Vectors in Two and Three Dimensions 10.2 Scalar Product 10.3 Vector Product	1. Determine the types of vectors 2. Perform addition and scalar multiplication of vectors 3. Find the scalar product 4. Use the properties of scalar product 5. Find the angle between two vectors 6. Find the direction cosines for a non-zero vector 7. Find the vector product 8. Use the properties of vector product 9. Find the area of parallelogram
18 3 – 7 Dec 2023	Lecture 18 Tutorial 35 and 36	Dr Siti Norziahidayu Amzee Zamri	**Chapter 10: Vectors**	10. Find the equation of straight line in i) vector form ii) parametric form

			10.4 Application of Vectors in Geometry 10.5 Application of Vectors in Geometry	iii) Cartesian form 11. Find the angle between two straight lines 12. Find the equation of a plane in i) Vector form ii) Cartesian form 13. Find the angle between two planes 14. Find the angle between a line and a plane 15. Find the point of intersection between a line and a plane.
19	**STUDY WEEK (10 - 16 DECEMBER 2023)**			
20-21	**FINAL EXAMINATION (17 - 28 DECEMBER 2023)**			

TEXT BOOKS

i. Ong Beng Sim et. Al. 2018. Mathematics for Matriculation Semester 1. 5th edition. Oxford Fajar.

ii. Abdul Hadi Yaakub et. Al. 2017. Mathematics for Matriculation Semester 2. 5th edition updated. Oxford Fajar.

REFERENCES

i. Bittinger, M.L., Ellenbogen, D.J. and Johson, B.L. 2013. Elementary and Intermediate Algebra: Concepts and Applications. 6th Edition. Pearson.

ii. Blitzer, R.F. 2012. Algebra and Trigonometry. 5th Edition. Pearson.

iii. Calter, P.A and Calter, M.A. 2011. Technical Mathematics with Calculus. 6th Edition. John Wiley.

iv. Lial, M., Hornsby, J. and McGinnis, T. 2011. Beginning Algebra. 11th Edition. Pearson.

v. Stewart, J., Redlin, L. and Watson, S. 2011. Precalculus: Mathematics for Calculus. 6th Edition. Cengage Learning.

BASIC INFORMATION AND COMMUNICATION TECHNOLOGY

SUBJECT: BASIC INFORMATION AND COMMUNICATION TECHNOLOGY

CONTENT SYNOPSIS:

This course aims to equip students with the knowledge and skills to use computer applications. The topics emphasis on the concept of a computer system such as history, hardware, systems software and applications software. At the end of this course, the students should be able to use the appropriate software application to completing the task related to ICT effectively.

COURSE LEARNING OUTCOMES (CLO):

At the end of this course the students will be able to:-

CLO 1:   Apply the concepts and process related to information communication technology (ICT) effectively. (C3)

CLO 2:   Display software application to assist user in completing the task. (P3)

CLO 3:   Demonstrate appropriate software application to solve related information communication technology (ICT) problem effectively. (A3)

LEARNING ACTIVITIES
1. Lectures
2. Computer Lab

ASSESSMENT METHODS

Assessment Method		Percentage (%)	
Formative	Mid- Term Test	20	50%
	Lab Test	20	
	Lab Assignment	10	
Summative	Final examination	50	

OUTLINE OF COURSE CONTENT (LECTURES)

Week	Lecture	Lecturer	Title	Learning Outcomes
1		Dr. Hasni/ Miss A	1. **Introduction to Computer** -Information System -Evolution of Computing -People -System -Hardware -Data -Connectivity, the Wireless Revolution, and the Internet	• Explain why computer literacy is vital to success in today's world • Describe the five components of a computer • Discuss the advantages and disadvantages that users experience when working with computers • Discuss the uses of the Internet and World Wide Web • Distinguish between system software and application software • Differentiate among types, sizes, and functions of computers in each category • Explain how home users, small office/home office users, mobile users, power users, and enterprise users each interact with computers • Discuss how society uses computers in education, finance, government, health care, science, publishing, travel, and manufacturing
2		Dr. Hasni/ Miss A	2. **The Internet, the Web, an Electric Commerce** -The Internet and the Web - Access - Communication	• Identify and briefly describe various broadband Internet connections • Describe the types of Internet access providers • Explain the purpose of a Web browser and identify the components of a Web address
3		Dr. Hasni/ Miss A	-Search Tools -Electronic Commerce -Web Utilities	• Describe how to use a search engine to search for information on the Web • Describe the types of Web sites
4		Dr. Hasni/ Miss A	3. **Application Software**	• Identify the four categories of application software

			-Application Software -Word Processors -Spreadsheets Applications	• Describe characteristics of a user interface • Identify the key features of widely used business programs
5		Dr. Hasni/ Miss A	- Presentation graphics -Database Management Systems - Specialized Applications - Graphics - Web Authoring Programs - Mobile Apps - Software Suites	• Identify the key features of widely used graphics and multimedia programs • Discuss Web applications • Identify the types of application software used in communications • Describe the learning aids available for application software
6		Dr. Hasni/ Miss A	**4. System Software** -System Software -Operating Systems -Mobile Operating Systems -Desktop Operating Systems -Virtualization -Utilities -Device Drives	• Define system software and identify the two types of system software • Describe the functions of an operating system • Summarize the features of several stand-alone operating systems • Identify various server operating systems • Briefly describe several embedded operating systems • Explain the purpose of several utility programs •
7		Dr. Hasni/ Miss A	**5.The System Unit** -The System Unit -Electronic Data and Instructions -System Board -Microprocessor -Microprocessor chips -Memory -Expansion Slots and Cards -Bus Line -Ports -Power Supply -Electronic Data and Instructions	• Differentiate among various styles of system units on desktop computers, notebook computers, and mobile devices • Describe the control unit and arithmetic logic unit components of a processor, and explain the four steps in a machine cycle • Define a bit and describe how a series of bits represents data • Differentiate among the various types of memory

8		Dr. Hasni/ Miss A	-Expansion Slots and Cards -Bus Line -Ports -Power Supply -Electronic Data and Instructions	• Describe the purpose and types of expansion slots and adapter cards • Differentiate between a port and a connector, and explain the differences among a USB port and other ports • Describe the types of buses in a computer • Understand how to clean a system unit on a computer or mobile device
9		**MID SEMESTER EXAMINATION (24 – 28 SEPTEMBER 2023)**		
		MID SEMESTER BREAK (29 SEPTEMBER - 7 OCTOBER 2023)		
10		Dr. Hasni/ Miss A	**6. Input and Output** -What is Input -Keyboard Entry -Pointing Devices -Scanning Devices -Image Capturing Devices -Digitizing Devices -Audio Input Devices -What is Output -Monitors -Printers -Audio-Output Devices -Combination Input and Output Devices	• Identify the keys and buttons commonly found on desktop computer keyboards, and describe how keyboards for mobile computers and devices differ from desktop computer keyboards • Describe different mouse types • Describe various types of touch screens and explain how a touch-sensitive pad works • Describe various types of pen input • Explain other types of input • Explain the characteristics of LCD monitors, LCD screens, and CRT monitors • Summarize the various types of printers • Identify the purpose and features of speakers, headphones, and ear-buds; data projectors; and interactive whiteboards • Identify input and output options for physically challenged users
11		Dr. Hasni/ Miss A	**7. Secondary Storage** -Storage -Hard Disks -Optical Disks	• Describe the characteristics of an internal hard disk including capacity, platters, read/write heads, cylinders, sectors and tracks, and revolutions per minute

				• Discuss the purpose of network attached storage devices, external and removable hard disks, and hard disk controllers • Describe the various types of flash memory storage • Describe cloud storage and explain its advantages
12		Dr. Hasni/ Miss A	-Cloud Storage -Mass Storage Devices	• Describe the characteristics of optical discs • Differentiate among various types of optical discs • Identify the uses of tape, magnetic stripe cards, smart cards, microfilm and microfiche, and enterprise storage
13		Dr. Hasni/ Miss A	**8. Communications and Network** -Communications -Communication Channels -Connection Devices -Data Transmission	• Discuss connectivity, the wireless revolution, and communication systems. • Describe physical and wireless communications channels. • Discuss connection devices and services, including dial-up, DSL, cable, satellite, and cellular. • Describe data transmission factors, including bandwidth and protocols. • Discuss networks and key network terminology including network interface cards and network operating systems. • Describe different types of networks, including local, home, wireless, personal, metropolitan, and wide area networks. • Describe network architectures, including topologies and strategies. • Discuss the organization issues related to Internet technologies and network security.

14		Dr. Hasni/ Miss A	**9. Privacy, Security, and Ethics** -People -Privacy	• Identify the most significant concerns for effective implementation of computer technology. • Discuss the primary privacy issues of accuracy, property, and access. • Describe the impact of large databases, private networks, the Internet, and the Web on privacy. • Discuss online identity and major laws on privacy.
15		Dr. Hasni/ Miss A	-Security -Ethics	• Discuss cybercrimes including creation of malicious programs such as viruses, worms, Trojan horse, and zombies as well as denial of service attacks, Internet scams, identity theft, cyberbullying, rogue Wi-Fi hotspots, and data manipulation. • Detail ways to protect computer security including restricting access, encrypting data, anticipating disasters, and preventing data loss. • Discuss computer ethics including copyright law, software piracy, digital rights management , the Digital Millennium Copyright Act, as well as plagiarism and ways to identify plagiarism. •
16		Dr. Hasni/ Miss A	**10. Information Sytems** -Organizational Information Flow -Computer-Based Information Systems -Transaction Processing Systems	• Explain the functional view of an organization and describe each function. • Describe the management levels and the informational needs for each level in an organization. • Describe how information flows within an organization. • Describe computer-based information systems. • Distinguish among a transaction processing system, a management information system, a decision support system,

				• and an executive support system. •
17		Dr. Hasni/ Miss A	-Management Information System -Decision Support Systems -Executive Support System	• Distinguish between office automation systems and knowledge work systems. • Explain the difference between data workers and knowledge workers. • Define expert systems and knowledge bases. •
18		Dr. Hasni/ Miss A	**11. Systems Analysis and Design** - Phase 1: Preliminary Investigation - Phase 2: Systems Analysis - Phase 3: Systems Design - Phase 4: Systems Development - Phase 5: Systems Implementation	• Describe the six phases of the systems life cycle. • Identify information needs and formulate possible solutions. • Analyze existing information systems and evaluate the feasibility of alternative systems. • Identify, acquire, and test new system software and hardware. • Switch from an existing information system to a new one with minimal risk. • Perform system audits and periodic evaluations. • Describe prototyping and rapid applications development.
19	STUDY WEEK (10 - 16 DECEMBER 2023)			
20	FINAL EXAMINATION (17 - 28 DECEMBER 2023)			

OUTLINE OF COURSE CONTENT (COMPUTER LAB)

WEEK	ACTIVITY	LECTURER	TITTLE	LEARNING OUTCOME
2	**Practical**	Dr. Hasni/ Miss A	Introduction to Internet Introduction to Internet Browsing	• Demonstrate how to use a search engine to search for information on the Web • Display the types of Web sites
3, 4 & 5	**Practical**	Dr. Hasni/ Miss A	Microsoft Word • Introduction • Formatting text and paragraph -copy, paste,cut -font, size -alignment -column -drop cap -superscript and subscript -borders and shading -bullet/ numbering • Page formatting -page border -header and footer -footnote -page numbers -create hyperlink -watermarking • Tables (column, row, merge etc) • Graphic, Smart Art, Watermark • Mail merge	• Demonstrate the application of Microsoft Word in information communication technology.
6	**Lab Test**	Dr. Hasni/ Miss A	Microsoft Word	

10, 11 & 12	**Practical**	Dr. Hasni/ Miss A	Microsoft Excel • Intro to toolbar and function, label, column and row • Cell, address, rename • Formulas • Grading function (lookup table) • Graphs and charts	• Demonstrate the application of Microsoft Excel in information communication technology.
13	**Lab Test**	Dr. Hasni/ Miss A	Microsoft Excel	
14 & 15	**Practical**	Dr. Hasni/ Miss A	Microsoft Power Point (PP) • Introduction to PP (buttons, ribbon, tabs etc) • Create PP Presentation (create slides, apply themes, slide shows etc) • Animation etc • Tables and Charts • Insert movies and sounds • Hyperlink and action buttons	• Demonstrate the application of Microsoft Power Point in information communication technology.
16	**Lab Assignment**	Dr. Hasni/ Miss A	Microsoft Power Point	

REFERENCES BOOKS

MAIN REFERENCES SUPPORTING THE COURSE (THE LATEST 5 YEARS)

i.   O'Leary, T. & O'Leary, L. 2021 .Computing Essentials 2021, 28th Edition. McGraw-Hill.

ADDITIONAL REFERENCES SUPPORTING THE COURSE

i.   Misty, E., Vermaat, Susan L., Sebok, Steven, M., Jennifer, T., Campbell, Mark Frydenberg. (2018) Discovering computers complete : tools, apps, devices, and the impact of technology. 1st Edition. Boston, Massachusetts: Cengage Learning.

ii.   Rajaraman V. (2018). Introduction to Information Technology. 3rd Edition. PHI Mediamatics Publications.

PENGHAYATAN ISLAM

SUBJEK: PENGHAYATAN ISLAM

SINOPSIS :

Kursus ini membincangkan berkenaan tiga aspek utama agama Islam, iaitu Akidah, Fekah dan Akhlak. Aspek akidah menumpukan kepada tiga perkara, iaitu ketuhanan, kerasulan dan hari kiamat. Fekah menjelaskan berkaitan thaharah, solat dan puasa. Manakala akhlak pula menghuraikan tentang sifat mahmudah, mazmumah dan cara-cara penyucian hati. Kaedah pengajaran dan pembelajaran bagi kursus ini ialah menerusi kuliah dan e-pembelajaran. Penghayatan terhadap kursus ini diharapkan dapat membentuk dan melahirkan muslim sejati yang mempunyai pegangan yang sahih, amalan yang benar dan berkeperibadian mulia.

HASIL PEMBELAJARAN KURSUS (CLO):

Pada akhir kursus ini pelajar sepatutnya dapat:

CLO1 : Menerangkan pegangan akidah dan ibadah yang benar berasaskan penjelasan ulama Ahl al- Sunnah wa al-Jamaah. **(C2)**

CLO2 : Mematuhi nilai akhlak mulia dalam melaksanakan tugasan terpilih berhubung isu kontemporari. **(A2)**

ASSESSMENT METHODS

Assessment Methods		Percentage (%)
Penilaian Berterusan	Ujian 1	30
	Ujian 2	30
	Tugasan Berkumpulan (Projek)	25
	Tugasan Berkumpulan (Pembentangan)	15
TOTAL		**100**

OUTLINE OF COURSE CONTENT (LECTURE)
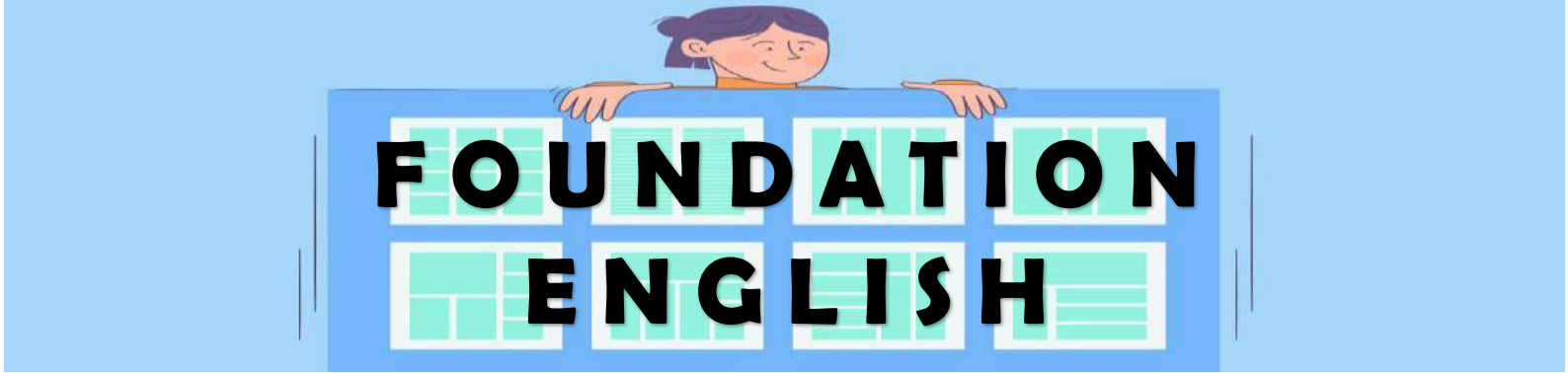
Week	Lecture	Chapter	Learning Outcomes
1	Lecture 1 (3 Hour PTG)	**1. AKIDAH** • Pengenalan Ilmu Akidah • Makrifatullah	• Menerangkan pegangan akidah yang benar berasaskan penjelasan ulama Ahl al-Sunnah wa al-Jamaah.
2	Lecture 2 (3 Hour PTG)	**Ketuhanan** 1. Wajib, mustahil dan harus bagi Allah SWT.	• Menerangkan pegangan akidah yang benar berasaskan penjelasan ulama Ahl al-Sunnah wa al-Jamaah.
3	Lecture 3 (3 Hour PTG)	2. Nama-nama Allah SWT. 3. Ayat Mutasyabihat	• Menerangkan pegangan akidah yang benar berasaskan penjelasan ulama Ahl al-Sunnah wa al-Jamaah.
4	Lecture 4 (3 Hour PTG)	**Kerasulan** Nabi dan Rasul 1. Sifat Wajib, mustahil dan harus bagi Rasul 2. Mukjizat Rasul	• Menerangkan pegangan akidah yang benar berasaskan penjelasan ulama Ahl al-Sunnah wa al-Jamaah.
5	Lecture 5 (3 Hour PTG)	**Perkara Ghaib** 1. Malaikat dan Jin	• Menerangkan pegangan akidah yang benar berasaskan penjelasan ulama Ahl al-Sunnah wa al-Jamaah.
6	Lecture 6 (3 Hour PTG)	2. Hari Kiamat Tanda Kecil Kiamat Tanda Bersar Kiamat	• Menerangkan pegangan akidah yang benar berasaskan penjelasan ulama Ahl al-Sunnah wa al-Jamaah.

7	**Lecture 7** (3 Hour PTG)	**2. FIQH** Thaharah • Pengenalan • Najis dan hadas • Alat untuk bersuci • Cara bersuci	• Menerangkan ibadah yang benar berasaskan penjelasan ulama Ahl al- Sunnah wa al-Jamaah.
8	**Lecture 8** (3 Hour PTG)	**Solat** 1. Pengenalan 2. Syarat wajib 3. Rukun	• Menerangkan ibadah yang benar berasaskan penjelasan ulama Ahl al- Sunnah wa al-Jamaah.
9		**MID SEMESTER EXAMINATION (24 – 28 SEPTEMBER 2023)**	
		MID SEMESTER BREAK (29 SEPTEMBER - 7 OCTOBER 2023)	
10	**Lecture 9** (3 Hour PTG)	**Solat** 4. Solat berjamaah 5. Qasar dan jamak	• Menerangkan ibadah yang benar berasaskan penjelasan ulama Ahl al- Sunnah wa al-Jamaah.
11	**Lecture 10** (3 Hour PTG)	6. Solat Jumaat 7. Solat Sunat	• Menerangkan ibadah yang benar berasaskan penjelasan ulama Ahl al- Sunnah wa al-Jamaah.
12	**Lecture 11** (3 Hour PTG)	**Puasa** 1. Syarat Wajib 2. Syarat Sah 3. Rukun	• Menerangkan ibadah yang benar berasaskan penjelasan ulama Ahl al- Sunnah wa al-Jamaah.
13	**Lecture 12** (3 Hour PTG)	**Pengenalan Akhlak** 1.Sifat Mahmudah 2.Sifat Mazmumah	• Mematuhi nilai akhlak mulia dalam melaksanakan tugasan terpilih berhubung isu kontemporari.
14	**Lecture 13** (3 Hour PTG)	3. Penyucian Jiwa	• Mematuhi nilai akhlak mulia dalam melaksanakan tugasan terpilih berhubung isu kontemporari.

15	Test 2 (3 Hour)		
16	Lecture 14 (3 Hour)	Pembentangan tugasan berkumpulan	• Mematuhi nilai akhlak mulia dalam melaksanakan tugasan terpilih berhubung isu kontemporari.
17	Lecture 15 (3 Hour)	Pembentangan tugasan berkumpulan	• Mematuhi nilai akhlak mulia dalam melaksanakan tugasan terpilih berhubung isu kontemporari.
18	Lecture 16 (3 Hour)	Pembentangan tugasan berkumpulan	• Mematuhi nilai akhlak mulia dalam melaksanakan tugasan terpilih berhubung isu kontemporari.
19	STUDY WEEK (10 - 16 DECEMBER 2023)		
20-21	FINAL EXAMINATION (17 - 28 DECEMBER 2023)		

BUKU RUJUKAN

i.   Muhadir Haji Joll (2019) sifat 20 : Suatu Pengenalan Asas.Galeri Ilmu Sdn. Bhd. Perlis.

ii. Engku Ali Engku Endut (2019). Fiqh Solat: Memahami Ibadat Sembahyang. Kota Baharu: Syarikat Jaffar Rawas Sdn. Bhd.

iii. Mustafa Khin (2019). Al Fiqh al Manhaji Mazhab al Syafie (Terj. Zulkifli bin Mohamad al-Bakri). Putrajaya: JAKIM

iv. Muhadir (2019) 206 Permasalahan Puasa. Kuala Lumpur: Galeri Ilmu Sdn. Bhd.

v.   Said bin Ibrahim. 1995. Huraian Asma Husna Jalan Menghayati Akidah Islam. Kuala Lumpur. Darul Makrifah

vi. Abdul Qadir al-Mandili. terj, Abdul Basit b Abdul Rahman,DR. 2018. Penawar Bagi Hati.PTS PUBLISHING HOUSE SDN BHD

FOUNDATION ENGLISH

SUBJECT : FOUNDATION ENGLISH I

CONTENT SYNOPSIS

This course is designed to serve a foundation for the English for academic purpose. It will help students to comprehend and practical skills to show their English proficiency level, which focuses on listening and reading skills. This course also provides students with opportunities to enhance their soft skills through individual or group tasks. Moreover, it prepares students for their university entrance examination.

COURSE LEARNING OUTCOMES (CLO)

At the end of the semester, students will be able to;

CLO 1   :   Practice basic reading and listening skills in various texts **(A2, PLO8)**

CLO 2   :   Practice basic reading and listening skills in different types of linear and non-linear texts **(A2, PLO5)**

ASSESSMENT METHODS

Assessment Methods		Percentage (%)
Continuous	Listening Test 1 (MCQ)	25
	Reading Test 1 (MCQ)	25
	Listening Test 2 (MCQ)	25
	Reading Test 2 (MCQ)	25
TOTAL		**100**

OUTLINE OF COURSE CONTENT (LECTURE)

Week	Lectures	Notes
1	Introduction To The Course	
2	**Listening** Listening Vs. Hearing Listening Skill (Pre, During and Post Listening)	
3	**Reading** General Strategy	
4	**Listening** Types of Listener (Passive vs Active Listener) Note-Taking Technique	
5	**Reading** Skimming Scanning	
6	**Listening** Identifying Main Ideas and Supporting Details Identifying Specific Information	
7	**Reading** Distinguishing Facts From Opinions	
8	**Listening** Listening for Purpose Listening for the Gist of the Texts	
	MID SEMESTER EXAMINATION (24 – 28 SEPTEMBER 2023)	
	MID SEMESTER BREAK (29 SEPTEMBER - 7 OCTOBER 2023)	
9	**Listening** Making Inference Making Prediction	Listening (MCQ) 25%
10	**Reading** Contextual Clues Reference	

11	**Reading** Making Inference Making Prediction	Reading (MCQ) *25%*
12	**Listening** Listening for Tone to Understand Attitude Listening for Drawing Conclusion	
13	**Reading** Paraphrasing Summarising	
14	**Listening** Types of Non Linear Texts Strategy for Non Linear Texts	
15	**Reading** Drawing conclusion	
16	**Listening** Information Transfer	Listening (MCQ) *25%*
17	**Reading** Types of Non Linear Text Interpreting Non Linear Text	
18	**Reading** Information Transfer	Reading (MCQ) 25%
19	**STUDY WEEK (10 - 16 DECEMBER 2023)**	
20-21	**FINAL EXAMINATION (17 - 28 DECEMBER 2023)**	

REFERENCES

i.   Kaur, H. & Jonas, F. (2019). Effective practice MUET. Selangor, Malaysia: Oxford Fajar

ii. Yat, C.W., Yeoh W.T., Nyanaprakasan, S. & Yee, S.F. (2018). Ace ahead MUET tenth edition, Selangor: Oxford Fajar.