



**ZIAUDDIN UNIVERSITY**  
EXAMINATION BOARD

# **Secondary School Certificate (SSC)**

## **Examination Syllabus**

### **General Science**

**IX**

**Based on Provincial Revised  
Curriculum  
(Sindh)**



## PREFACE

The Ziauddin University Examination Board (ZUEB) was established under **Sindh ACT XLI 2018**, with the primary objective of enhancing the quality of education in Sindh. ZUEB is responsible for administering examinations for the **Secondary School Certificate (SSC)** and **Higher Secondary School Certificate (HSSC)** in alignment with the most recent revisions to the **National Curriculum**, as outlined by the **Directorate of Curriculum Assessment and Research (DCAR), Sindh**. Through its ordinance, ZUEB is mandated to provide examination services for both English, Urdu, and Sindhi medium candidates from private schools across Sindh. This examination syllabus reflects ZUEB's dedication to achieving the educational goals set by the provincial authorities.

In collaboration with subject professors, ZUEB has developed a comprehensive syllabus for each subject. It is important to distinguish between the syllabus and the curriculum. The syllabus serves as a guide for both teachers and students, outlining the key areas of focus within the subject. It provides students with a clear understanding of what is expected of them in their studies and helps them prepare effectively for their exams. This examination syllabus incorporates all cognitive outcomes derived from the **Provincial Curriculum Statement**, ensuring that assessments are both valid and reliable. While the focus is primarily on the cognitive domain, significant emphasis is placed on the application of knowledge and understanding.

The syllabus is made available to all stakeholders via the ZUEB website to assist affiliated schools in planning their teaching. It is crucial to note that the syllabus, rather than the prescribed textbook, forms the foundation of ZUEB examinations. Additionally, this syllabus supports the development of learning materials for both students and teachers. ZUEB remains committed to supporting students undertaking the SSC and HSSC courses by facilitating their learning outcomes through this detailed syllabus document.

To further assist in the learning process, ZUEB provides a dedicated **e-resource tab** on its website, offering both text-based and video content on various subjects. These 15–20-minute instructional videos, created around key subject concepts, allow students to learn at their own pace and convenience. The videos can be used as a reinforcement tool to revisit lessons already taught or as pre-lesson material. This initiative is an ongoing effort, and new videos will continue to be uploaded.

We encourage all students and educators to make the most of these resources for a more enriched and flexible learning experience.

Sincerely,

Saleem Ahmed

Manager Social Sciences

Ziauddin University Examination Board

## INTRODUCTION

The study of science is a fundamental component of a comprehensive education, empowering students to grasp the intricacies of the natural world and cultivate critical thinking skills. In the Pakistani context, science education plays a pivotal role in equipping students with the knowledge and skills necessary to navigate the complexities of the modern world. By delving into the fundamental principles of science, students can develop a profound understanding of the world around them, from the intricate mechanisms of living organisms to the vast expanse of the universe. As Carl Sagan aptly observed, "Science is a way of thinking much more than it is a body of knowledge."

Teaching science is essential because it fosters curiosity, creativity, and critical thinking in students. By engaging with scientific concepts and processes, students acquire essential skills, such as observation, experimentation, and analysis, which are valuable in a wide range of academic and professional pursuits. Science education also enables students to make informed decisions about issues that impact their lives and the world around them, from environmental sustainability to healthcare and technological innovation.

The scope of science education at secondary level is comprehensive, encompassing a broad spectrum of topics in physics, chemistry, and biology. Students explore the fundamental laws of physics, including motion, energy, and forces, as well as the principles of chemistry, such as atomic structure and chemical reactions. In biology, students study the diversity of life, from cells to ecosystems, and develop an understanding of the intricate relationships between living organisms and their environment. By mastering these scientific concepts, students become able to pursue careers in science, technology, engineering, and mathematics (STEM) fields, as well as other areas that require critical thinking and problem-solving skills.

The study of science has far-reaching implications for individuals and society, enabling us to address complex challenges, drive innovation, and improve the human condition. By emphasizing science education, we empower students to become curious, informed, and engaged citizens who can contribute to Pakistan's development and progress. As Marie Curie wisely observed, "One never notices what has been done; one can only see what remains to be done," underscoring the importance of scientific inquiry in driving progress and innovation. By investing in science education, we can unlock the potential of future generations and equip them to tackle the complex challenges of the 21st century.

## **STANDARDS of GENERAL SCIENCE GRADE IX**

Following standards have been framed for Grade IX General Science Education. These standards are followed by bench marks. These bench marks further divided into student learning outcomes for each learning area.

These are the details of each standard:

### **Standard 1: Life Science**

Students will be able to understand, explain and differentiate between the structure, characteristics and basic needs of living things, the processes of life, and will also investigate the diversity of life and how living things interact with each other and their environment.

### **Standard 2: Physical Science**

Students will analyze (quantitatively and qualitatively) the structures, properties, forms, and patterns in matter and energy, predict changes and interactions, and evaluate theories and structures using knowledge of chemistry and physics.

### **Standard 3: Earth and Space Science**

Students will understand and explain the structure, processes, and interactions among the Earth's systems. They will also explain scientific theories about the origin and evolution of the Earth and the universe, and investigate how we learn about the universe.

### **Standard 4: Skills**

Students will develop the skills required for scientific inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions, and for reflecting on scientific knowledge and its application.

### **Standard 5: Attitudes**

Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge for the mutual benefit of self, society, and the environment.

### **Standard 6: Science, Technology, Society, and the Environment (STSE)**

Students will develop an understanding of the nature of science and technology, the relationship between science and technology and of the social and environmental context of science and technology.

## **Key**

**K** = Knowledge

**U** = Understanding

**A** = Application and other higher order cognitive skills

**CRQs** = Constructed Response Questions

**ERQs** = Extended Response Questions

**CA** = Classroom Activity

**ECA** = Extended Classroom Activity

(ECAs are not to be assessed under examination condition)

### Syllabus General Science IX

Topics & Sub-topics	Student Learning Outcome	Cognitive Level <sup>1</sup>		
<b>A: HISTORY AND NATURE OF SCIENCE</b>	Student will be able to:	<b>K</b>	<b>U</b>	<b>A</b>
<b>Nature of Science</b>  <b>History of Science as a Human Endeavour (Individual, Cultural, and Technological Contributions to Scientific Knowledge)</b>  <b>Science and Islam</b>  <b>Disciplines of Science</b>	A-1 Define science	*		
	A-2 Describe how the nature of science makes it different from other modes of knowing.		*	
	A-3 Describe how human curiosity and needs have influenced science, impacting the quality of life world-wide.		*	
	A-4 Describe the contributions of some eminent Muslim scientists (Jabar Bin Hayyan, Muhammad Bin Zikrya Al- Razi, Abni-ul-Haitham, Al-Bairuni and Bu Ali Sina) in science.		*	
	A-5 Describe how various people and cultures in past and present have made important contributions to scientific innovations.		*	
	A-6 Analyze the specific changes in science that have affected society.			*
	A-7 Analyze the specific cultural and societal issues that promote or hinder scientific advancements.			*
	A-8 Explain the process by which accepted ideas are challenged or extended by scientific innovation.		*	
	A-9 Distinguish between pure and applied science.			*
	A-10 Explain how Islam supports the acquisition of scientific knowledge.		*	
	A-11 Explain the relationship between different branches of science.		*	

<b>Limitations of Science</b>	A-12 Describe the limitations of science.		*	
<b>Topics &amp; Sub-topics</b>	<b>Student Learning Outcome</b>	<b>Cognitive Level</b>		
<b>B: CHEMISTRY AND LIFE</b>	Student will be able to:	<b>K</b>	<b>U</b>	<b>A</b>
<b>Chemical composition of common materials used in our daily life</b>	B-1 Identify the chemical composition of common materials such as plastic, polyester, nylon, polythene, rubber, glass, sugar, table salt, washing powder.		*	
<b>Common elements and compounds and their physical and chemical properties</b>	B-2 Compare the physical and chemical properties of elements and compounds to assess their potential uses and associated risks (e.g., hydrogen versus helium in balloons, copper versus aluminum in wiring, copper versus lead in plumbing, water and alcohol in thermometers, petrol and diesel in automobiles)			*
<b>Impact of production of chemical products on our lives and environment</b>	B-4 Investigate how the production of chemical products (aerosol, CFCs, fertilizers, pesticides) has an impact on our lives and environment			*
<b>Chemical change in the events that we encounter daily</b>	B-5 Find examples of chemical changes in the events that we encounter daily (burning, rusting, fermentation, respiration and decaying).			*
<b>The recycling of elements and chemical compounds</b>	B-6 Describe the recycling of elements and compounds (Cu, Fe, Al, plastic, glass and rubber) and its benefits		*	
<b>Potential Careers</b>	B-3 Investigate potential careers associated with an understanding of the physical and chemical properties of elements and compounds.			*
<b>Topics &amp; Sub-topics</b>	<b>Student Learning Outcome</b>	<b>Cognitive Level<sup>2</sup></b>		
<b>C: HEALTH, DISEASES &amp; PREVENTION</b>	Student will be able to:	<b>K</b>	<b>U</b>	<b>A</b>
<b>Natural food products, processed food, fast and junk food. Malnutrition, under nutrition, overeating, obesity</b>	C-1 Explain the relationship among dietary intake, eating behaviour, physical activity, and emotional health		*	

<b>Cleanliness</b>	C-2 Explain the cleanliness and its importance for health		*	
<b>Blood and its Diseases</b>	C-3 Briefly describe the composition of blood and mention the causes and effects of important blood diseases like leukemia, hemophilia and anemia.		*	
<b>Diseases caused by Bacteria, Virus and Fungus</b>	C-4 Describe the viral (Small pox, Polio, Measles & Hepatitis), bacterial (Tuberculosis, Whooping Cough, Diphtheria, Tetanus, Typhoid & Cholera), fungal infections (Ring Worm) and Parasitic (Malaria, Threadworms, Ascaris) diseases in terms of their causes, signs and symptoms, preventions and treatments		*	*
<b>Human immune mechanism and HIV - AIDS</b>	C-5 Collect and interpret local, national, and international statistics on a specific disease spread by germs.		*	ECA
<b>Strokes &amp; Risk Factors</b>	C-6 Describe the ways to cope with the spread of HIV. C-7 Research the relationship of strokes to the risk factors: obesity, high-fat diets and smoking.			ECA
<b>Action Plan for Good Health</b>	C-8 Design and evaluate a personal action plan for good health and nutrition.			*
<b>Research and medical advances in Diseases Control</b>	C-9 Analyze ways in which research and medical advances have changed the process which help to prevent, diagnose, monitor, and/or treat specific diseases and their spread.			
<b>Emergency and First-Aid</b>	G-10 Describe the first aid of dog bites, snake bites, insect bites, and artificial respiration and role play the same situations for the first aid.		*	
<b>Topics &amp; Sub-topics</b>	<b>Student Learning Outcome</b>	<b>Cognitive Level<sup>3</sup></b>		
<b>D: POPULATION AND ENVIRONMENT</b>	Student will be able to:	<b>K</b>	<b>U</b>	<b>A</b>
<b>Growth of human population</b>	D-1 Assess how the size and the rate of growth of human population are determined by birth rate, death rate, immigration, emigration, urbanization and carrying capacity of the environment.			*



<b>Rate of human population growth in Pakistan and neighboring countries</b>	D-2 Describe the rate of human population growth in Pakistan and neighboring countries.		*	
<b>The impacts of human overpopulation on environment</b>	D-3 Explain the impacts of overpopulation on the environment.		*	
<b>Relationship between overpopulation and sustainable development</b>	D-4 Describe how overpopulation is the major hindrance in the sustainable development of any region.		*	
<b>Topics &amp; Sub-topics</b>	<b>Student Learning Outcome</b>	<b>Cognitive Level<sup>4</sup></b>		
<b>E: ENERGY SOURCES</b>	Student will be able to:	<b>K</b>	<b>U</b>	<b>A</b>
<b>Energy sources and their significance</b>	E-1 Describe energy sources (fossil fuels, hydrogen as fuel, nuclear energy, hydroelectric power, wind and solar energy).		*	
	E-2 Explain: Conventional and non-conventional energy sources. Renewable and non-renewable energy sources.		*	
<b>Measurement of energy cost (Natural gas and electricity)</b>	E-3 Measure energy cost (natural gas and electricity)			*
<b>Energy consumption &amp; conservation</b>	E-4 Identify the role energy sources play in the development of a country		*	
	E-5 Recognize that limited energy sources are available to Pakistan.		*	
	E-6 Compare the annual production of fossil fuels and alternate fuels in Pakistan with their consumption.			*
	E-7 Evaluate the ways of conservation and effective utilization of the available energy sources in Pakistan.			*
<b>Resource Protection and Management</b>	E-8 Suggest various methods of energy source protection and management and suggest a plan for Pakistan.		*	*
<b>Energy and the environment; nuclear fuel hazards – remedial measures</b>	-9 Describe thermal pollution, fossil and nuclear pollution and fuel hazards.			*
	E-10 Critically reflect on nuclear energy usage in the world and its impact on the life on Earth.			*
	E-11 Analyze various factors existing around in their surroundings leading to thermal pollution, fossil fuel pollution and nuclear fuel hazards and suggest remedial measures to overcome it.			*

## Scheme of Assessment

**Subject: General Science**

**Grade: IX**

**Table 1: Number of Student Learning Outcomes by Cognitive Level**

Topic No.	Topics	No. of Sub-topics	SLOs <sup>5</sup>			Total
			K	U	A	
1	A: History and Nature of Science	5	1	8	3	12
2	B: Chemistry and Life	5	--	2	4	6
3	C: Health, Diseases & Prevention	9	--	6	4	10
4	D: Population and Environment	4	--	3	1	4
5	E: Energy Sources	5	--	5	6	11
	<b>Total</b>	<b>28</b>	<b>1</b>	<b>24</b>	<b>18</b>	<b>43</b>
	<b>Percentage</b>		<b>2%</b>	<b>56%</b>	<b>42%</b>	<b>100%</b>

**Table 2: Exam Specification**

Topic No.	Topics	Assessment Items Distribution		
		MCQs	CRQs	ERQs
1	A: History and Nature of Science	4	2	1
2	B: Chemistry and Life	3	3	--
3	C: Health, Diseases & Prevention	3	3	1
4	D: Population and Environment	2	1	1
5	E: Energy Sources	3	1	2
	<b>Total</b>	<b>15</b>	<b>10</b>	<b>5</b>

**Table 3: Marks Distribution Section-wise**

<b>Sections in Exam Paper<sup>6</sup></b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>Total</b>
Types of Assessment Items in each Section	<b>MCQs</b>	<b>CRQs</b>	<b>ERQs</b>	
Total number of Items given in each Section	15	10	5	
Number of Items to be attempted in each Section	15	6	3	
Maximum Marks for each Item	1	5	10	
(Marks for each item x No. of items)	<b>1 x 15=</b>	<b>5 x 6=</b>	<b>10 x 3=</b>	
<b>Maximum Marks for each Section</b>	<b>15</b>	<b>30</b>	<b>30</b>	<b>75</b>
<b>Percentage</b>	<b>20%</b>	<b>40%</b>	<b>40%</b>	<b>100%</b>