TYLER JUNIOR COLLEGE

School of Continuing Studies
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Education & Training Plan
Life Sciences Specialist Certificate Program with Externship

Student Full Name: _____

Start Date: _____ End Date: _____

Program includes National Certification & an Externship Opportunity
Mentor Supported

Life Sciences Specialist Certificate Program with Externship

Course Code:	TJC-SC-BIO
Program Duration:	6 Months
Course Contact Hours:	375
Student Tuition:	$3,999

The Life Sciences Specialist

Biology is the study of life – from the smallest of organisms no larger than single cells to the most complex plants and animals that make up the world we live in. As part of biology, anatomy refers to the structures associated with the human body and physiology covers the function of each of these structures. The human body is one of the most complicated organisms on the planet, yet despite the fact that each of us owns one of these complex machines, very few of us understand its complexities, functions and capabilities. Like all living organisms, in order for human bodies to work properly, all of its parts must function as optimally as possible all the time. For any individuals working in health careers, a full understanding of all life around us including our own is fundamental to success on the job.

The Life Sciences Specialist Program

Students completing this program will gain a fundamental understanding of the biological principles and the properties of life, considering the structure and function of plants and animals, their relationship to various organisms, to each other and the environment they inhabit. Taking an in-depth look at cell biology principles, reproduction, development and growth, students will begin to understand the mechanics of evolution, inheritance and genetics. Students will learn the various ways for classifying different organisms, animals, and plants, as well as the human body, the characteristics and distinctions between them as well as the way in which all of these organisms contribute to the overall environment. This program also provides an overview of the anatomical structures and physiology of the human body. In addition, the program discusses selected major pathologies, including disease definitions and causes, signs and symptoms, diagnostic procedures, and possible treatments.

Education and National Certifications

- Students should have or be pursuing a high school diploma or GED.
- There are no state approval and/or state requirements associated with this program.
- There is a National Certification exam available to students who successfully complete this program:
  - **Microsoft Office Specialist (MOS) Certification Exam**.

Program Objectives

At the conclusion of this program, students will be able to:

- Explain basic biology concepts and terminologies
- Explain the relationship among DNA, mRNA, amino acids, and proteins
- Distinguish between two types of cellular division, energy flows and membrane transport
- Classify components of animal and plant cells
- Determine the mechanisms of evolution and different patterns of inheritance
- Distinguish different types of biodiversity, Population growth and decline
- Explain basic industrial biotechnological procedures
- Outline components of ecology
- Describe the organization of the human body
- Explain the contribution that each body system makes to homeostasis of the body
- Identify the major anatomical structures and the purposes of each body system
- Explain basic physiological processes in each of the body systems
- Describe selected human diseases in terms of definition, cause, signs and symptoms, diagnostic procedures, and possible treatments for each of the body systems
- Describe common issues or changes that occur in each body system
- Use Microsoft Office

National Certification

Upon successful completion of this Tyler Junior College (TJC) program, students would be eligible to sit for the Microsoft Office Specialist (MOS) exam. Although there are no state approval, state registration or other state requirements for this program, students who complete this program at TJC will be prepared and are eligible to sit for this national certification exam. Students who complete this program are encouraged to complete the externship option with their program. Students who complete this program can and do sit for the MOS national certification exams and are qualified, eligible and prepared to do so. TJC works with each student to complete the exam application and register the student to take their national certification exam.

Externship / Hands on Training / Practicum

Although not a requirement, once students complete the program, they have the ability to participate in an externship and/or hands on practicum so as to practice the skills necessary to perform the job requirements of a professional in this field. Students will be assisted with completing a resume and/or other requirements necessary to work in this field. All students who complete this program are eligible to participate in an externship and will be placed with a participating organization near their location. TJC works with national organizations and has the ability to place students in externship opportunities nationwide.

Tyler Junior College contact: If students have any questions regarding this program including national certification and clinical externships**, they should call Judie Bower of Tyler Junior College at | 1-800-298-5226 or via email at jbow@tjc.edu**

Note: No refunds can be issued after the start date published in your Financial Award document.

School of Continuing Studies
TYLER JUNIOR COLLEGE

About Tyler Junior College!

Welcome to Tyler Junior College! One of the oldest junior colleges in Texas, the College was established in 1926 with a mission of providing the finest academic education for freshmen and sophomore students. Tyler Junior College remains committed to that goal while also recognizing the changing role of community colleges and the need to provide quality training for technical fields. There are several unique aspects of the healthcare career programs available to students through the School of Continuing Studies at Tyler Junior College (TJC). In addition to enrollment of over 32,000 students annually, Tyler Junior College (TJC) has been the Texas leader in healthcare technician training and education programs for over 12 years. Over the last 12 years, approximately 13,000 students have successfully completed TJC's Pharmacy Technician, Dental Assisting, Medical Billing & Coding, Clinical Medical Assistant and other healthcare programs.

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PEARSON
Education

Tyler Junior College and Pearson Education
The Tyler Junior College School of Continuing Studies eLearning programs were developed in partnership with Pearson Education to produce the highest quality, best-in-class content and delivery necessary to enhance the overall student learning experience, boost understanding and ensure retention. Pearson Education is the premier content and learning company in North America offering solutions to the higher education and career training divisions of colleges and universities across the country aimed at driving quality education programs to ensure student success.

About Pearson Education
Welcome to Pearson. We have a simple mission: to help people make more of their lives through learning. We are the world's leading learning company, with 40,000 employees in more than 80 countries helping people of all ages to make measurable progress in their lives. We provide a range of education products and services to institutions, governments and direct to individual learners, that help people everywhere aim higher and fulfil their true potential. Our commitment to them requires a holistic approach to education. It begins by using research to understand what sort of learning works best, it continues by bringing together people and organizations to develop ideas, and it comes back round by measuring the outcomes of our products. Please visit us at **www.pearson.com**

The Life Sciences Specialist Program Detailed Student Objectives:

WHAT IS BIOLOGY?
- Summarize the main fields of study in biology
- Articulate the basic principles of biology
- Describe the application of biology in everyday life

LIFE AND MATTER
- Explain the chemical properties of life
- Appraise the different environments that support life on Earth
- List the domains of life

BASIC COMPONENTS OF LIFE: THE CELL
- Compare the components of plant cells versus animal cells
- Describe the differences between prokaryotic and eukaryotic cells
- Describe the principles and history of cell theory

ENERGY TRANSPORT
- Explain the function of cellular membranes
- Compare the different ways in which substrates are transported across cellular membranes
- Describe the various ways in which energy is transported and transferred within the cells

CELLULAR REPRODUCTION
- Explain the process of mitosis
- Explain the process of meiosis
- Distinguish between the outcomes for sexual and asexual cellular divisions

DNA: THE MOLECULE OF LIFE
- Identify the components of DNA
- Describe DNA replication
- Describe the transcription of mRNA
- Describe the translation of mRNA and the creation of protein molecules

PATTERNS OF INHERITANCE
- Define genes
- Differentiate between dominant and recessive genes
- Contrast sex-linked genes and multi-factorial inheritance

EVOLUTION
- Summarize the factors that allow for natural selection
- Articulate the ways in which species evolve
- Differentiate among species, ecological diversity, and genetic diversity

BIODIVERSITY
- Explain the biological species concept
- Research the means of speciation
- Explain how new species form
- Describe extinction

ECOLOGY

- Define ecology
- Distinguish among population ecology, community ecology, and organismal ecology
- Differentiate between ecosystem and biosphere
- List abiotic factors that affect living organisms
- List biotic factors that affect living organisms
- Explain the impacts of pollution in an ecosystem
- Describe the effects of global climate changes on different ecosystems

COMMUNITIES AND POPULATION ECOLOGY

- List factors that influence population growth and decline
- Compare the basic patterns of population distribution
- Express different types of community interactions among species and within species

BIOTECHNOLOGY

- Describe recombinant DNA technology
- Explain how polymerase chain reaction amplifies DNA
- Describe how gel electrophoresis works
- Explain the use of DNA probes
- Research the uses of genetic engineering

INTRODUCTION TO BODY STRUCTURE AND ORGANIZATION

- Describe body planes, cavities, regions, and directional terms
- Define homeostasis and its importance to the human body
- Outline the levels of organization of the body, including the body systems
- Identify the structures and functions of the organelles of a typical human cell

THE INTEGUMENTARY SYSTEM

- Explain the functions of the skin, including its contribution to homeostasis
- Identify the anatomical structures of the skin
- Explain the function of the anatomical structures of the skin
- Describe selected integumentary system diseases and disorders
- Describe issues and changes related to the integumentary system at different points in the lifespan

THE SKELETAL SYSTEM

- Describe the organization of the skeletal system
- Explain the functions of bone, including its contribution to homeostasis
- Identify the anatomical structures of the skeletal system, including the major bones
- Describe selected skeletal system diseases and disorders
- Describe issues and changes related to the skeletal system at different points in the lifespan

THE MUSCULAR SYSTEM

- Identify the anatomical structures of the muscular system, including the major muscles
- Explain the basic concept of muscle contraction
- Describe how the muscular system contributes to homeostasis of the body
- Describe selected muscular system diseases and disorders
- Describe issues and changes related to the muscular system at different points in the lifespan

THE NERVOUS SYSTEM AND SPECIAL SENSES

- Describe the organization of the nervous system
- Identify the anatomical structures of the nervous system and special senses and their functions
- Explain how an electrical impulse is conducted through a nerve
- Explain how the nervous system contributes to the homeostasis of the body
- Describe selected nervous system and special senses diseases and disorders
- Describe issues and changes related to the nervous system and special senses at different points in the lifespan

THE CARDIOVASCULAR SYSTEM

- Identify the anatomical structures of the cardiovascular system
- Explain how blood flows through the heart, lungs, and body
- Describe the electrical conduction system of the heart
- Explain the cardiac cycle, including how the cardiovascular system contributes to the homeostasis of the body
- Describe the different types of blood vessels and their function
- Explain how blood pressure is measured
- Describe the composition and functions of blood
- Describe selected cardiovascular system diseases and disorders
- Describe issues and changes related to the cardiovascular system at different points in the lifespan

THE IMMUNE SYSTEM

- Identify the anatomical structures of the immune system
- Describe how immunity works
- Explain how the immune system contributes to the homeostasis of the body
- Describe selected immune system diseases and disorders
- Describe issues and changes related to the immune system at different points in the lifespan

THE RESPIRATORY SYSTEM

- Identify the anatomical structures of the respiratory system and their functions
- Explain the mechanics of breathing
- Explain internal and external respiration
- Explain how the respiratory system contributes to the homeostasis of the body
- Describe selected respiratory system diseases and disorders
- Describe issues and changes related to the respiratory system at different points in the lifespan

THE DIGESTIVE SYSTEM

- Identify the anatomical structures of the digestive system and their functions
- Explain the physiology of digestion through the system
- Explain how the digestive system contributes to the homeostasis of the body
- Describe selected digestive system diseases and disorders
- Describe issues and changes related to the digestive system at different points in the lifespan

THE URINARY SYSTEM

- Identify the anatomical structures of the urinary system and their functions
- Describe the composition of urine
- Explain the physiology of the urinary system
- Explain how the urinary system contributes to the homeostasis of the body
- Describe selected urinary system diseases and disorders
- Describe issues and changes related to the urinary system at different points in the lifespan

THE ENDOCRINE SYSTEM

- Identify the anatomical structures of the endocrine system and their functions
- Explain how the endocrine system contributes to the homeostasis of the body
- Describe selected endocrine system diseases and disorders
- Describe issues and changes related to the endocrine system at different points in the lifespan

THE REPRODUCTIVE SYSTEMS

- Identify the anatomical structures of the male and female reproductive systems
- Explain the menstrual cycle
- Explain the physiology of reproduction
- Explain how the reproductive system contributes to the homeostasis of the body
- Describe selected male and female reproductive system diseases and disorders
- Describe issues and changes related to the reproductive system at different points in the lifespan

Note: This program can be completed in 6 months. However, students will have online access to this program for a 24-month period.

MICROSOFT OFFICE Module

- Use an integrated software package, specifically the applications included in the Microsoft Office suite
- Demonstrate marketable skills for enhanced employment opportunities
- Describe proper computer techniques for designing and producing various types of documents
- Demonstrate the common commands & techniques used in Windows desktop
- List the meaning of basic PC acronyms like MHz, MB, KB, HD and RAM
- Use WordPad and MSWord to create various types of documents
- Create headings and titles with Word Art
- Create and format spreadsheets, including the use of mathematical formulas
- Demonstrate a working knowledge of computer database functions, including putting, processing, querying and outputting data
- Define computer terminology in definition matching quizzes
- Use the Windows Paint program to alter graphics
- Use a presentation application to create a presentation with both text and graphics
- Copy data from one MS Office application to another application in the suite
- Use e-mail and the Internet to send Word and Excel file attachments
- Demonstrate how to use the Windows Taskbar and Windows Tooltips
- Explain how copyright laws pertain to data and graphics posted on the Internet
- Take the college computer competency test after course completion
- Follow oral and written directions and complete assignments when working under time limitations

Note: Although the Microsoft Office Module is not required to successfully complete this program, students interested in pursuing free Microsoft MOS certification may want to consider completing this Microsoft Office Module at no additional cost.

System Requirements:

Windows Users:

- Windows 8, 7, XP or Vista
- 56K modem or higher
- Soundcard & Speakers
- Firefox, Chrome or Microsoft Internet Explorer

Mac OS User:

- Mac OS X or higher (in classic mode)
- 56K modem or higher
- Soundcard & Speakers
- Apple Safari

iPad Users:

- Due to Flash limitations, eLearning programs are NOT compatible with iPads

Screen Resolution:

- We recommend setting your screen resolution to 1024 x 768 pixels.

Browser Requirements:

- System will support the two latest releases of each browser. When using older versions of a browser, users risk running into problems with the course software.
- Windows Users: Mozilla Firefox, Google Chrome, Microsoft Internet Explorer
- Mac OS Users: Safari, Google Chrome, Mozilla Firefox

Suggested Plug-ins:

- Flash Player
- Real Player
- Adobe Reader
- Java