

Biomedical Technology (40-assignment)



This is an integrated instructional module designed specifically to operate within the LJ ScanTEK Modular Technology Program environment. It includes a 10-assignment exploratory curriculum and a further 30-assignment in-depth curriculum. The exploratory curriculum and the in-depth curriculum are each split into two parts. Each part includes a pre-test and post test. The module includes hardware, software and curriculum materials sufficient to provide a complete learning experience.

The curriculum incorporates continuous assessment through questions. When used in conjunction with a ClassAct networked management system, this provides instant feedback of student performance. The assessments begin with a comprehensive pre-test. This quiz includes questions for each subsequent assignment, together with questions that will specifically test math and reading ability.

Every assignment starts with a series of questions designed to track inventory. These ensure that any missing items are located before they are needed.

Each assignment is divided into a series of tasks. Hands-on tasks form the core of the student work. Where appropriate, these are accompanied by research tasks based upon illustrated textbooks and on-screen applications. Assessment questions are incorporated into each task.

Typical 10-assignment topic areas include:

- Child growth charts
- Reading and recording vital signs of life
- Cell structure
- Investigating the human body using 3D model software
- Optical function and lens correction
- Body temperature and respiration
- Clinical tests to analyse artificial blood and urine
- Dialysis and kidney transplant implications
- Teeth casting
- Ambulance and paramedic services
- Veterinary occupations
- Physicians occupations

Typical 10-assignment activities include:

- Explore the use of simple technology to highlight growth patterns.
- Study the effect of diseases on weight changes on growth charts and how to overcome weight loss caused by diseases.
- Use a simple microscope to study healthy and damaged cells as a way to diagnose disease at a cellular level.
- Explore careers in the medical profession.
- Use a software package to study the human body in 3 dimensions.
- Build a 2 dimensional model to show the various sizes and positions of the major organs in the human body.
- Investigate optical illusions and the relationship between the brain and eye.
- Use software to find out about the brain.
- Identify the vital signs of life as a way to assess health or illness.
- Measure temperature, pulse and respiration.
- Explore methods used to read and record the vital signs of life.
- Use clinical tests to analyze artificial blood and urine samples.

Typical 10-assignment activities include (continued):

- Explore biomedical materials by making a dentist's model cast of teeth.
- Watch a video about the range of technologies used in the medical field.
- Find out about more careers in the medical field such as paramedics, ambulance services or physicians.

Typical 30-assignment topic areas include:

- Growth chart analysis to identify disease
- Diagnosis of kidney problems and treatments
- Vaccination and immunity
- Asthma
- Eye disorders
- Advances in biomedical technology
- X-Rays
- Urinalysis
- Diagnosis and prognosis
- Real-time data logging of pulse and ECG trace
- Blood circulation and the cardiovascular system
- Function of the heart
- Blood flow
- Materials in bio-engineering
- Bones, ligaments, muscles and skin
- DNA, genetics and finger prints
- Genetic profiling
- Forensic evidence

Typical 30-assignment activities include:

- Explore the use of simple technology to highlight growth patterns of young children.
- Study the effect of diseases on weight changes on growth charts and how to overcome weight loss caused by diseases.
- Study and analyze the life-saving biomedical technology of oral rehydration therapy (O.R.T.)
- Discover the mechanism of transmission for disease.
- Recognize the role of immunization in preventing disease.
- Experiment to find out the causes of eye disorders.
- Distinguish between long and short sightedness.
- Investigate the anatomy of the human eye using a software program.
- Perform a virtual artificial hip operation.
- Study the latest advances in biomedical technology using a video program.
- Explore the technology of X-rays.
- Use a software program to find out how levels of sugar, water and protein are regulated in the body.
- Carry out tests of artificial blood and urine in a problem solving exercise.
- Use a software program to study the physiology of the urinary system.
- Interpret renograms in the diagnosis of kidney problems.
- Assess data about a patient and diagnose the problem in a problem solving exercise.

Biomedical Technology (40-assignment)

Typical 30-assignment activities include (continued):

- Compare the cost effectiveness of the various treatments.
- Identify the vital signs of life as a way to assess health or illness and how they are used to diagnose disease or monitor recovery.
- Measure temperature, pulse and respiration rate.
- Use data-logging to carry out a fitness test.
- Interpret results of a fitness test to assess physical condition.
- Use a software program to study blood and its many functions.
- Explore the different types of blood vessel in the circulatory system.
- Explore different types of blood disorder.
- Use a software program to look at different blood groups and compatibility between them.
- Investigate coronary heart disease
- Use a software program to look at imaging techniques used in the medical field today.
- Discover two techniques, used by surgeons, for rectifying disorders relating to blocked coronary arteries.
- Use a software program to discover how the respiratory system works.
- Investigate how oxygen is absorbed by the blood in the lungs and how carbon dioxide is removed from the blood.
- Explore different techniques for imaging the lungs.
- Use a software program to find out about the lungs.
- Find out about asthma and ways to relieve its symptoms.
- Research materials used in bio-engineering.
- Research human factors engineering.
- Study the anatomy of the foot and the function of the modern jogging shoe.
- Design a surgical mask.
- Make a model of an upper set of teeth using real dental materials.
- Identify different types of teeth.
- Make suggestions for tooth repairs.
- Identify types of fingerprint.
- Investigate a suspect's fingerprint.
- Research fingerprints and how they are made.
- Investigate the use of iodine when taking fingerprints.
- Use the 3D body software and CAI to research DNA.
- Investigate genetic fingerprints.
- Create an 'Evidence Profile and Suspect Information Record'.

Each assignment is designed around a list of performance objectives. These lists include academic, technical and occupational objectives. The assignments are written in such a way as to enable a student to attain the performance objectives, with the assessment questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct management system to generate a comprehensive portfolio of student competency reports. Default reports supplied with this module include:

- Entry report
- Technical/Occupational Exit report
- Basic Skills report based upon the federal SCAN's report.

The items supplied with this instructional module include:

- 10-assignment On-Screen Student Assignment Guide CD
- 10-assignment Student Assignment Guide
- 10-assignment Student Workbook
- 10-assignment Instructor's Guide
- 30-assignment Student Assignment Guide
- 30-assignment Student Workbook
- 30-assignment Instructor's Guide
- Computer Aided Instruction Software
- Cells and the Brain Fact File sheet
- Software: The Ultimate Human Body
- Video: 'Health and Technologies'
- Model Eye
- Lamp
- Bioviewer
- Pack of Acetate Sheets
- Carton Alginate Powder
- Carton Plaster of Paris
- Beakers
- Drug Abuse Bioset
- Nutrition Bioset
- Laboratory Samples Testing Kit
- Human X-ray Print Set
- PulseTEK Interface Unit
- Pulse Sensor
- ECG Sensor Lead and Adhesive Pads

Additional items required:

- Computer

Module Facts

For Technology Program, order as: ST170/40 Biomedical Technology

	No.	Average time
Assignments	40	45 minutes
Extension Activities	4	45 minutes
Total		33 hours



LJ Technical Systems
Web site: www.ljgroup.com