

BIOMEDICAL EQUIPMENT REPAIR TECHNOLOGY

MASTER PLAN OF INSTRUCTION

2024-2025

Ernest White, Instructor



MISSION

The mission of Fort Myers Technical College is to provide high quality career and technical training, in order to prepare students for current and emerging industries, delivered by a professional and caring staff in a positive learning environment.

The School Board of Lee County, Florida does not discriminate nor tolerate discrimination on the basis of race (including anti-Semitism), color, ethnicity, national origin, sex, sexual orientation, gender identification, gender expression, disability (physical or mental), pregnancy, marital status, age (except as authorized by law), religion, military status, socioeconomic status, linguistic preference, genetic information, ancestry, or any other reason protected under applicable federal, state, or local law in the provision of educational programs, activities or employment policies as required by Title II, Title VI, and Title VII Civil Rights Act of 1964 including, Title IX of the United States Education Amendments of 1972, Age Discrimination in Employment Act of 1967 (ADEA), Individuals with Disabilities Education Act (IDEA), Section 504 of the Rehabilitation Act of 1973, Florida Civil Rights Act of 1992, Genetic Information Nondiscrimination Act of 2008, Americans with Disabilities Act of 1990 (ADA) and the Amendment Act of 2008 (ADAAA), and the Florida Educational Equity Act of 1984. The School Board also provides equal access of its facilities to youth groups, as required by the Boy Scouts of America Equal Access Act. Any sections of the District's collectively bargained, negotiated agreements dealing with hiring, promotion, and tenure will contain a statement of nondiscrimination similar to that in the Board's statement above. As required by Florida's Educational Equity Act, the Superintendent shall submit an annual equity report addressing the District's educational and employment practices. The School Board of Lee County, Florida, prohibits retaliation by any District personnel against a person for reporting, filing or being a witness in a discrimination (including harassment) charge, complaint, investigation or lawsuit associated or in connection with this policy. Established grievance procedures and appropriate discrimination complaint forms are available from the Office of Civil Rights & Equity, Academic and Student Support Services or the Equity Coordinator at each school. Complaints/inquiries regarding compliance with these regulations may be submitted in writing to: For Employees: Office of Civil Rights & Equity Compliance at (239) 337-8134 or at CivilRightsEquity@leeschools.net. For Students: Office of Positive Prevention at (239) 939-6858.

Lack of English language skills will not be a barrier to admission and participation. The District may assess each student's ability to benefit from specific programs through placement tests and counseling, and, if necessary, will provide services or referrals to better prepare students for successful participation.



Fort Myers Technical College
3800 Michigan Avenue
Fort Myers, FL 33916
(239) 334-454



The purpose of this program is to provide students the opportunity for employment in a variety of electronic/mechanical related occupations. After completing the 1140-hour program, students are prepared to assemble, install, maintain, troubleshoot and repair biomedical equipment in the industry. Materials used are self-paced which allow students to progress at their own pace. Competencies in each area are completed after both written and performance testing.

PROGRAM MISSION

The mission of the Biomedical Equipment Repair Technology program is to prepare students for employment as a biomedical electronics technician in the local community. With a broad knowledge base, many areas of employment are possible. Students are encouraged to obtain Industry certification as a Biomedical Imaging Equipment Technician (BIET) in Electronics Technicians Association, International (ETA).

PROGRAM PHILOSOPHY

This program is a combination of classroom instruction using the most up-to-date textbooks, computers, software, and equipment available. The student is eligible to test for certification by the Biomedical Imaging Equipment Technician (BIET), at Electronics Technicians Association, International. After completing the Biomedical Equipment Repair Technology program, the student is prepared to enter the workforce as Biomedical Imaging Equipment Technician (BIET).

PROGRAM CONTENT

- Demonstrate proficiency in Soldering and Basic Laboratory Practices
- Demonstrate proficiency in Basic Direct Current (DC) Circuits
- Demonstrate Employability Skills
- Demonstrate an understanding of Entrepreneurship
- Demonstrate proficiency in Knowledge of Basic Computer Usage
- Demonstrate proficiency in Advanced Direct Current (DC) Circuits
- Demonstrate proficiency in Alternating Current (AC) Circuits
- Demonstrate proficiency in Analog Circuits
- Demonstrate proficiency in Solid State Devices
- Demonstrate proficiency in Digital Circuits
- Demonstrate proficiency in Fundamental Micro-Processors
- Demonstrate appropriate understanding of Basic Math Skills
- Demonstrate an understanding of Basic Science Skills
- Demonstrate Skills in Technical Recording
- Demonstrate appropriate Communication Skills
- Demonstrate Proficiency with Transistor Pulse Amplifiers
- Demonstrate proficiency with Trigger Device Circuits
- Demonstrate proficiency with Operational Amplifiers
- Demonstrate proficiency in knowledge of Electromagnetics
- Demonstrate proficiency with Fiber Optic Applications
- Demonstrate proficiency in DC Motors Systems
- Demonstrate proficiency with Motor Control Systems
- Demonstrate an understanding of Safety Concepts and Best Practices
- Demonstrate appropriate understanding of The Human Machine
- Demonstrate an understanding of Monitoring Systems
- Demonstrate proficiency with Medical Support Equipment
- Demonstrate proficiency with Medical Monitoring Equipment
- Demonstrate proficiency with Motors
- Demonstrate proficiency with Power Systems
- Demonstrate proficiency with Laboratory Equipment
- Demonstrate proficiency with Sterilization Equipment
- Demonstrate an understanding of Biomedical Imaging Systems
- Demonstrate proficiency with Radiographic Imaging Systems
- Demonstrate proficiency with Magnetic Resonance Imaging Systems
- Demonstrate proficiency with Impedance Tomography Systems

- Demonstrate proficiency with Life Support Systems
- Demonstrate proficiency with Respiratory Systems
- Demonstrate proficiency with Cardio Systems
- Demonstrate proficiency with Renal systems
- Demonstrate proficiency with Incubators
- Demonstrate proficiency with Biomedical Optic Systems
- Demonstrate proficiency with Surgical Support Tools
- Demonstrate proficiency using Biomedical Information Systems
- Graphically illustrate an understanding of Anatomy
- Reinforce knowledge of Medical Terminology
- Demonstrate proficiency in Computer Communication
- Demonstrate understanding and knowledge of Electro/Mechanical Safety
- Demonstrate understanding in Building Wiring
- Demonstrate proficiency in Basic Radiographic Equipment
- Demonstrate proficiency in Film Processing
- Demonstrate proficiency in Test Equipment
- Demonstrate an understanding of Magnetic Resonance Imaging
- Demonstrate understanding and knowledge of Computed Tomography
- Demonstrate an understanding of Nuclear Medicine
- Demonstrate an understanding of Codes and Regulations Applications
- Demonstrate proficiency in Troubleshooting
- Demonstrate proper application of Radiation Safety
- Demonstrate an understanding and knowledge of Radiation Physics
- Demonstrate proficiency in Linear Accelerators

ESSENTIAL TRAINING TASKS

Physical Requirements

Student must have the following: good hand-eye coordination, able to grasp small objects, good manual dexterity, able to see colors, assemble objects and parts, and move freely to observe and evaluate projects.

Cognitive Requirements

Students must be able to follow written and oral instructions; interpret electrical schematics and mechanical drawings; have excellent communication and troubleshooting skills; be able to interpret test results to determine circuit faults; be a team player; and work well with others.

ACCOMMODATIONS

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or post-secondary student's accommodations plan to meet individual needs to ensure equal access. Post-secondary students with disabilities must self-identify, present documentation, required accommodations if needed, and develop a plan with their post-secondary service providers. Accommodations received in post-secondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology, and special communication systems. Documentation of the accommodations requested and services provided are maintained in a confidential file.

TUITION

Tuition is charged for adult students at a reasonable rate that may vary slightly from year to year and is due prior to the first day of each payment period. Current fee information is available from Student Services. Tuition is waived for eligible high school dual-enrolled students. Failure to pay all fees due at the time class begins will result in the student not being able to attend class and/or clinical.

CLASS SCHEDULE

Classes meet Monday through Friday from 8:00 A.M. until 2:30 P.M. This amounts to 30 hours of classroom instruction per

week. Lunch breaks are 30 minutes in length.

ATTENDANCE POLICY

In an effort to develop appropriate employability skills, FMTC students are expected to attend all class sessions. As is expected in the workplace, when it is necessary to be absent due to illness or emergency situations, all students are to notify the instructor on or before the date of the absence. The student attendance policy for each post-secondary program is consistent with industry standards.

Campus attendance is kept via a computerized system. It is the responsibility of the student to **log in and out** in order to receive credit for class time. This allows the school to keep accurate attendance records for the actual number of hours and minutes attended.

All adult students are expected to be in attendance at least 90% of their scheduled hours during each payment period. Adult students failing to maintain the 90% attendance standard may not be permitted to continue in their program and may be withdrawn.

Absences

A student who is absent for 6 consecutive class sessions, without prior approval and without contacting the instructor, will be withdrawn from enrollment in his/her program.

Students who are late for class, including returning late from lunch, must clock in. Students who leave school early must notify their instructor and clock out. This time out of class is recorded as time absent and is counted against the required 90% attendance.

Adult students who know they will be out of school for an extended period of time may apply for a Leave of Absence from their program. Students who exercise a Leave of Absence may have to extend their time in their program and pay additional fees.

Leaving Campus During School Hours

Students must notify their instructor when leaving campus early. This is for the safety of students, to accurately track time, and to allow the instructor to best utilize instructional resources.

PLAN OF INSTRUCTIONAL PRACTICES

Teaching Methods

Teaching methods include lectures, demonstrations, hands-on training activities, online video training and presentations, virtual simulations, outside speakers from job-related businesses and industries, field trips, projects, co-op assignments with local businesses and manufacturing facilities.

Safety

Follow established electrical safety procedures and standards. No horseplay or unsafe conduct is acceptable.

Work-Based Activities

Work-based learning activities play an integral part of the curriculum of FMTC's career-technical training programs. These activities are planned with two objectives in mind. First, the activity provides students with the opportunity to develop and apply 'real world' experience using the knowledge and skills attained in the program. Second, the activity provides the instructor with objective input from potential employers or customers of program graduates. Each work-based activity has a written instructional plan outlining objectives, experiences, competencies, and evaluation required during the activity.

Cooperative Education

Cooperative training is available for students and coordinated by the instructor and career specialist. Cooperative training is for students who have shown competence in program training that indicates readiness for placement in an on-the-job program. High school students participating in the cooperative job placement program must be in the 12th grade. To be eligible for a cooperative education experience, students must have completed one-half of the required program hours and requirements.

Students may be returned to the program for additional training if they do not function satisfactorily on the job or when the cooperative agreement is terminated at the request of the student, parent, employer, or program instructor. Veterans will be accepted in the program in accordance with the Department of Veterans Affairs approved program.

Additional information regarding cooperative training opportunities may be obtained from the program instructor or career specialist.

GRADING POLICIES

Grading Categories:

Assessments	35%
Career Application	35%
Employability Skills	30%

Grading Scale:

A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

Each program has an employability skills rubric based on employee expectations in the industry.

Program Progress

Students are required to complete the program of training within the hours allotted by the state of Florida for completion. Progress must be at a rate that will allow completion of the program with the number of hours stated in the Curriculum Frameworks.

Work Habits

Effective work habits are the cornerstone to successful employment. Students are expected to demonstrate productive work habits during all phases of enrollment. Instructors will work with students who need assistance in this area to improve the overall possibility for successful employment.

Attendance: Attends class, arrives/leaves on time; begins and ends work as expected.

Character: Displays loyalty, honesty, trustworthiness, dependability, reliability, initiative, self-discipline, and self-responsibility; displays a high level of effort and commitment to performing and completing work.

Teamwork: Respects the right of others; respects confidentiality; is cooperative; is assertive; displays a customer service attitude; seeks opportunities for continuous learning; demonstrates mannerly behavior; encourages and facilitates cooperation, pride, trust, and group identity; fosters commitment and team spirit.

Appearance: Displays appropriate dress, grooming, hygiene, and etiquette; wears full regulation uniform.

Attitude: Displays a willingness to cooperate and accept constructive criticism; sets realistic expectations; approaches assignments with interest.

Productivity: Is prepared for class by reading assignments and completing homework; contributes to class discussions; and involvement in lab activities (in other words, no sleeping or daydreaming). Follows safety practices; conserves and maintains equipment and supplies; keeps work area neat and clean; follows directions and procedures; makes up assignments and tests punctually; notifies proper authorities of situations presenting potential safety hazards; does not use or knowingly permits others to use tools and equipment improperly; stays on task and utilizes time constructively.

Organization: Manifests skill in prioritizing and management of time and stress; demonstrates flexibility in adapting to changes.

Communication: Communicates accurate information to others in a professional and courteous manner; displays appropriate nonverbal (eye contact, body language) and oral (listening, telephone etiquette, grammar) skills; asks pertinent questions; listens attentively to others, notifies instructor in advance of absences or tardies.

SATISFACTORY ACADEMIC PROGRESS

In order to receive and continue to receive financial assistance of any type, a student must maintain satisfactory academic progress. The Financial Aid Administrator will require a progress report to be completed and submitted to the Financial Aid

Office prior to each disbursement.

Students are considered to be making Satisfactory Academic Progress (SAP) if they successfully complete their scheduled clock hours, achieve a specific cumulative grade average (CGA), and do not exceed the maximum time limits to complete their course of study. Each student's academic progress will be checked at 450 clock hours (300 hours for CHCA) and prior to subsequent disbursements for students enrolled in programs one academic year or greater. Progress will be checked at the half-way point for programs less than one academic year.

No SAP is required prior to the first disbursement.

REQUIREMENTS FOR CERTIFICATE

Certification for FULL program completion is determined by (1) mastery of 85% of program competencies as determined by the instructor, (2) a final grade of 75% or better (80% Health Sciences) in each course, and (3) proof of state-mandated basic skills levels; (4) attendance of a minimum of 90% of scheduled program hours (95% of scheduled hours for some Health Science programs). Under unique circumstances, instructors in our competency-based programs have the discretion to graduate students who fall short of 90% as long as #1-3 above are met. Students meeting these requirements are awarded a full program certificate.

A record of the student's progress is kept up-to-date by the instructor and available to the student in the FOCUS Student Portal. High school grades are reported to the assigned high school.

DRESS CODE

Each program at FMTC has a designated uniform.

Uniforms Required: FMTC uniform purple polo shirt (ordered at orientation), slacks or jeans (no sweatpants), appropriate length skirts, closed toed shoes (no crocs) and visible FMTC student ID badge.

PROGRAM STRUCTURE

Below is a summary of the Biomedical Equipment Repair Technology program structure. For more detailed information for each course, visit the FLDOE Curriculum Framework website: <http://origin.fldoe.org/academics/career-adult-edu/career-tech-edu/curriculum-frameworks/2024-25-frameworks/manufacturing.stml>

OCP A Basic Electronics Troubleshooter

Students completing OCP A will be able to obtain employment as troubleshooters of AC and DC circuits for firms in the electronics industry.

OCP B Electronics Equipment Repairer

Students working as electronic equipment repairers would be able to follow established test procedures ensuring that both incoming purchased parts and manufactured parts meet engineering specifications. They would be able to maintain quality control performance charts and write detailed reports for management's review.

OCP C (1 of 2) Biomedical Electronics Troubleshooter 1

A completer of Biomedical Electronics Troubleshooter 1 would be able to perform the tasks of an electronics troubleshooter or an electronics equipment repairer plus be able to troubleshoot and repair electronic/mechanical equipment. They would also be able to meet with customers and vendors to discuss repairs or necessary circuit revisions.

OCP C (2 of 2) Biomedical Repair Technician

A completer of Biomedical Repair Technician would be able to perform the tasks of an electronics troubleshooter or an electronics equipment repairer plus be able to troubleshoot and repair electronic/mechanical and medical equipment. They would also be able to meet with customers and vendors to discuss repairs or necessary circuit revisions.

OCP D (1 of 2) Medical Imaging Equipment 1

A completer of Medical Imaging Equipment 1 would understand electronics, circuits: medical terminology, and advance imaging techniques. They would have excellent organizational skills, be able to train team members and possess leadership capabilities.

OCP D (2 of 2) Biomedical Imaging Equipment Technician

A biomedical imaging equipment technician would understand advanced electronics, circuits: medical terminology, and advance imaging techniques. They would have excellent organizational skills, be able to train team members and possess leadership capabilities.

TEXTBOOKS

Required textbooks for the Biomedical Equipment Repair Technology program are supplied by FMTC.