LTC LAKESHORE TECHNICAL COLLEGE

# MANUFACTURING IT

## Program Number 10-631-4
## Associate Degree in Applied Science • Four Terms

### ABOUT THE PROGRAM
This program will prepare the learner to be employed at the technician level or higher to work on the technology that is at the intersection of I.T. and Manufacturing. The program will train students on industrial computer networks, computer operating systems and servers, programmable logic controllers, and other networked manufacturing operations technology. Students will learn how to troubleshoot and integrate these technologies and help bridge a skills gap in manufacturing environments.

### PROGRAM OUTCOMES
- Integrate IT systems with manufacturing equipment.
- Utilize network operating systems.
- Maintain PC and device support and security.
- Perform programming and configuration of Programmable Logic Controllers (PLCs)
- Implement computer networks to integrate manufacturing systems.
- Develop integration projects.

### CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES
LTC credits transfer to over 30 universities. For more information visit gotoltc.edu/future-students/transfer.

### ADMISSION AND PROGRAM ENROLLMENT STEPS
- Submit online application.
- Submit transcripts (high school & other colleges). NOTE: Official transcripts required for acceptance of transfer credits; Financial Aid may require.
- Complete the online Student Success Questionnaire.
- Schedule a Program Advising Session with your assigned advisor to plan your first semester schedule, review your entire plan of study, discuss the results of the Student Success Questionnaire.

### APPROXIMATE COSTS
- $138.90 per credit tuition (WI resident) plus $8.33 per credit student activity fee. $10 per credit online, iFlex or hybrid fee. Material fee varies depending on course. Other fees vary by program. Visit gotoltc.edu/financial-aid/tuition-and-fees for details.

### FINANCIAL AID
This program is eligible for financial aid. Visit gotoltc.edu/Financial-Aid or talk with your Admissions Advisor about how to apply for aid.

### CONTACT
LTC Admissions Advisor
920.693.1162 • CareerCoach@gotoltc.edu

| Catalog No. | Class Title | Credit(s) |
|---|---|---|
| | **Term 1** | |
| 10154104 | Intro to IT | 3 |
| 10150114 | Networking I | 3 |
| 10154122 | PC Support | 3 |
| 10801195 | Written Communication | 3 |
| 10804133 | Math & Logic | 3 |
| | | **15** |
| | **Term 2** | |
| 10150173 | Server Administration 1 | 3 |
| 10150176 | Networking 2 | 3 |
| 10154124 | Information Security Principles | 3 |
| 10620138 | Programmable Controllers - Allen Bradley | 3 |
| 10809196 | Introduction to Sociology OR 10809122 Introduction to American Government OR 10809166 Introduction to Ethics | 3 |
| | | **15** |
| | **Term 3** | |
| 10620115 | Electrical Math Applications | 2 |
| 10620105 | DC Fundamentals | 2 |
| 10150163 | Networking 3 | 3 |
| 10620140 | Programmable Controllers - Allen Bradley Advanced | 2 |
| 10620194 | Touch Screen Applications | 2 |
| 10620198 | Industrial Networks | 2 |
| 10150169 | Network Design and Documentation | 2 |
| | | **15** |
| | **Term 4** | |
| 10150164 | Mobile Devices | 3 |
| 10620110 | AC Fundamentals | 2 |
| 10620122 | Industrial Wiring | 2 |
| 10150177 | Internet of Things | 2 |
| 10801196 | Oral/Interpersonal Communication | 3 |
| 10809198 | Introduction to Psychology | 3 |
| | | **15** |
| | | **TOTAL 60** |

*Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with your advisor for details. The tuition and fees are approximate based on 2020-2021 rates and are subject to change prior to the start of the academic year.*

The Hire in HIGHER EDUCATION

2021-22

**AC FUNDAMENTALS**...prepares the student to analyze electrical circuits using AC math, analyze AC waveforms, measure and analyze AC power, analyze capacitors and inductors in DC and AC circuits, analyze AC circuits containing reactance and calculate resonance, applythe elements and properties of basic measuring circuits, and describe transformer characteristics. PREREQUISITE: 10620105 DC Fundamentals or 10660105 DC Fundamentals

**DC FUNDAMENTALS**...prepares the student to convert values to scientific and engineering notations; calculate math quantities; describe basic atomic theory; identify basic electrical terms; use established symbols standards; describe DC voltage characteristics and current sources and electrical resistance; measure and analyze electrical quantities in series and parallel circuits; and desolder/solder single lead components. COREQUISITE: 10804113 College Tech Math 1A or 10804115 College Tech Math 1

**ELECTRICAL MATH APPLICATIONS**...prepares learners to solve percent and proportion problems, use the laws of exponents, convert values between measurement systems, apply geometric concepts, and apply trigonometric concepts to solve right triangles. Emphasis will be on the application of skills to technical problems.

**INDUSTRIAL NETWORKS**...prepares the learner to configure, install and troubleshoot industrial communication networks. This course is highly computer based. COREQUISITES: 10620140 Programmable Controls AB Advanced. This class qualifies for 48 hours of Continuing Education Units (CEUs) for Electricians.

**INDUSTRIAL WIRING**...prepares the learner to follow safety procedures; maintain a safe and healthy work environment; construct electrical circuits; measure electrical quantities using a VOM and/or DVM; analyze measured values using electrical circuit laws; construct typical industrial control circuits; and analyze typical industrial control circuits.

**INFORMATION SECURITY PRINCIPLES**...introduces the learner to Information Systems Security. Students will review and analyze the control and security concerns in the information systems environment; the security challenges created from the emergence of new technology and the changing internal and external environments; and the effect of legal, regulatory, and current security technology on policy development. Opportunity to earn TestOut Security Pro Certification. PREREQUISITE: 10154104 Intro to IT

**INTERNET OF THINGS**...introduces students to IOT (Internet of things) connecting multiple physical objects that feature an IP address for internet connectivity. Learners will gain an understanding of the communication that occurs between these objects and other Internet-enabled devices and systems.

**INTRO TO IT**...introduces student to IT field to basic concepts and terminology of a computer system hardware and software, Operating Systems (including Mac OS), and Networks; applied skills include: managing computer data files; protecting against computer viruses; creating simple web pages; producing electronic word documents, spreadsheets and presentations; examining techniques of systems analysis and design, programming languages and database systems.

**INTRODUCTION TO PSYCHOLOGY**...introduces students to a survey of the multiple aspects of human behavior. It involves a survey of the theoretical foundations of human functioning in such areas as learning, motivation, emotions, personality, deviance and pathology, physiological factors, and social influences. It directs the student to an insightful understanding of the complexities of human relationships in personal, social, and vocational settings. PREREQUISITE: Reading placement assessment equivalent or COREQUISITE: 10838105 Intro to Reading and Study Skills

**INTRODUCTION TO SOCIOLOGY**...introduces students to the basic concepts of sociology: culture, socialization, social stratification, multi-culturalism, and the five institutions, including family, government, economics, religion, and education. Other topics include demography, deviance, technology, environment, social issues, social change, social organization, and workplace issues. COREQUISITE: 10838105 Intro to Reading and Study Skills or Reading placement assessment equivalent

**MATH & LOGIC**...will apply mathematical problem solving techniques. Topics will include symbolic logic, sets, algebra, Boolean algebra, and number bases. PREREQUISITE: 10834109 Pre-Algebra or Math placement assessment equiv and COREQUISITE: 10838105 Intro Rdg & Study Skills or Rdg placement assmnt equiv

**MOBILE DEVICES**...are quickly becoming indispensable tools in the production environment. This course will introduce the learner to various industry mobile technologies used to promote better decision-making, reporting, and improve manufacturing performance. Some of the devices covered are tablets, smartphones, barcode printers and readers, and radio frequency identification (RFID) readers/writers. Network Design and Documentation...is a lecture/hands-on course designed to introduce students to network design and documentation fundamentals. Topics include: needs analysis, hardware needs and analysis, network layout and design, and documenting a network. PREREQUISITE: 10150176 Networking 2

**NETWORKING 1**...is a lecture/hands-on course designed to introduce students to network fundamentals. Topics covered include: OSI Reference Model; LAN and WAN topologies; cabling systems; access methods; protocols; Internet working devices (e.g. hubs, bridges, routers, switches, etc.); and basic network design.

**NETWORKING 2**...provides the students with networking terminology, protocols, network standards, LAN's, WAN's, TCP/IP addressing, and routing. PREREQUISITE: 10150114 Networking 1

**NETWORKING 3**...introduces the student to switching technology, hardware and software firewalls, and virtual private networks (VPN). PREREQUISITE: 10150176 Networking 2

**ORAL/INTERPERSONAL COMMUNICATION**...provides students with the skills to develop speaking, verbal and nonverbal communication, and listening skills through individual speeches, group activities, and other projects. COREQUISITE: 10838105 Intro Reading and Study Skills or Reading placement assessment equivalent

**PC SUPPORT**...prepares you to be able to install, manage, repair, and troubleshoot PC hardware and Windows, Linux, and Mac operating systems. You will learn how to set up a new computer, identify system requirements, install or upgrade operating systems, manage external devices, troubleshoot common computer problems, and connect to a small home network. Opportunity to earn TestOut PC Pro Certification.

**PROGRAMMABLE CONTROLLERS - ALLEN BRADLEY**...prepares the student to understand basic PLC structure and terminology; learn to create and troubleshoot basic PLC programs using the RSLOGIX 500 software and the RSLINX communication software; become familiar with communicating with programming SLC-500 PLCs. This course is highly computer based.

**PROGRAMMABLE CONTROLLERS - ALLEN BRADLEY ADVANCED**.. prepares the student to develop applications utilizing subroutine instructions, analog modules; gain a basic understanding of creating and troubleshooting programs using the ControlLogix, RSLOGIX5000 software. This course is highly computer based. PREREQUISITE: 10620138 Prog Cntrls/AB. This class qualifies for 48 hours of Continuing Education Units (CEUs) for Electricians.

**SERVER ADMINISTRATION 1**...is a hands-on course designed to introduce the learner to the installation and configuration of Windows Server servers. The student will learn how to install and configure servers, configure server roles and features, configure Hyper-V, deploy and configure core network services, install and administer Active Directory (AD), and create and manage Group Policy. PREREQUISITE: 10154104 Intro to IT

**TOUCH SCREEN APPLICATIONS**...prepares the student to create, edit, and troubleshoot screens, objects and I/O related to the FactoryTalkME application. Students will create, edit and communicate with Allen-Bradley PLC programs for real-time control utilizing the touchscreen applications. This course is highly computer based. This class qualifies for 48 hours of Continuing Education Units (CEUs) for Electricians.

**WRITTEN COMMUNICATION**...teaches the writing process, which includes prewriting, drafting, revising, and editing. Through a variety of writing assignments, the student will analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Keyboarding skills are required for this course. It also develops critical reading and thinking skills through the analysis of a variety of written documents. PREREQUISITE: 10831103 Intro to College Wrtg or Writing placement assessment equivalent and COREQUISITE: 10838105 Intro to Rdg & Study Skills or Reading placement assessment equivalent