

# ADVANCED MANUFACTURING

## Manufacturing Production Technicians Occupational Outlook Information

### >>>> WHAT TECHNICIANS DO



- Inspect finished products
- Set up & operate production equipment
- Calibrate or adjust equipment using tools such as calipers, micrometers & height gauges

### >>>> PAY



The median annual wage was \$61,269 in 2015. Entry-level wages are often lower than the median.

### >>>> SKILLS



- Critical Thinking
- Active Listening
- Communicating

### >>>> HOW TO BECOME A TECHNICIAN



- Post-secondary certificates are common
- Some continue on to obtain their Associate's degree

### >>>> JOB OUTLOOK



The need is expected to grow in Ulster County.

Source: [www.onnetonline.org](http://www.onnetonline.org) March 2016

## SU INTRODUCTION TO ADVANCED MANUFACTURING CERTIFIED PRODUCTION TECHNICIAN

Local manufacturers, and SUNY Ulster, have partnered together to create a pipeline of skilled workers to meet the hiring needs of manufacturing employers and to prepare local job seekers with the skills needed to get self-sufficient jobs in manufacturing. This program consists of four individual certificate modules: Safety Certificate, Manufacturing Processes and Production Certificate, Quality Practices and Measurement Certificate, and Maintenance Awareness Certificate. Textbooks will be available for students to borrow. Approved by New York State Bureau of Veterans Education for payment of VA Education Benefits.

**Instructor: K. Crawford**

|             |   |            |             |     |                       |
|-------------|---|------------|-------------|-----|-----------------------|
| MFG 101     | M | 9/25-12/18 | 4:30-8:15pm | KSU | \$853 (includes fees) |
| DCB 1786-10 | M | 9/25-12/18 | 4:30-8:15pm | KSU | \$853                 |

No class 10/9

The DCB course is a non-credit option for the 3-credit MFG course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please **contact SUNY Ulster at 845-802-7171 or [reerb@sunyulster.edu](mailto:reerb@sunyulster.edu)**

Class time above does not include assessments. Students will schedule assessments with proctor. Course price includes four assessments. Any additional assessments that students need will be \$65 each.

**Contact Barbara Reer at [reerb@sunyulster.edu](mailto:reerb@sunyulster.edu) to learn how you can tailor this program for your employees.**

## SU NEW! LEAN SIX SIGMA (LSS) FUNDAMENTALS: YELLOW BELT CERTIFICATION

Lean and Six Sigma are the two most powerful problem solving approach methodologies used in today's industry. LEAN is a systematic method to continually improve products and services at little capital expenses by involving all employees in solving problems, eliminating wasteful costs, reducing lead times and improving quality. The main emphasis of LEAN is on cutting out unnecessary and wasteful steps in the creation of a product of the delivery of a process, so that only the steps that directly add value to the customer are taken.

Six Sigma is a method that provides organizations with the tools to improve the capability of their business processes by reducing the variation within its processes. This increase in performance and decrease in process variation lead to defect reduction and improvement in profit, employee morale and quality of products or services.

This course will help you to familiarize yourself with a set of tools and a structured project management approach; DMAIC. Upon successful completion of this Yellow Belt course participants will be able to:

- Recognize a variety of tools for problem solving
- Demonstrate knowledge of the LSS methodology
- Be ready to pursue the next level of certification: LSS Green Belt - which will require the completion of a project: either a real life case if the alumni is working in industry or an academic project provided by the institution (through the Black Belt instructor).

|             |       |          |       |     |       |
|-------------|-------|----------|-------|-----|-------|
| DCB 2169-01 | M/W/F | 10/16-20 | 6-9pm | KSU | \$499 |
|-------------|-------|----------|-------|-----|-------|

**ULSTER BOCES (UB) • REGISTRATION & INFORMATION • 845-331-5050 • [WWW.ULSTERBOCES.ORG/REGISTER](http://WWW.ULSTERBOCES.ORG/REGISTER)**

**8 M - MONDAY • T - TUESDAY • W - WEDNESDAY • R - THURSDAY • F - FRIDAY • S - SATURDAY • U - SUNDAY**

# ADVANCED MANUFACTURING

## MECHATRONICS FUNDAMENTALS

**SU** This four-course program is intended for students with some manufacturing skills or applicable military skills and prepares graduates for entry-level positions in local manufacturing companies that utilize automated, computer controlled production systems.

**DCB 2073-04** See individual course schedules below. **KSU** **\$796**

## **SU** MATHEMATICS FOR MANUFACTURING

Strengthen mathematic skills needed for the set-up and operation of machine tools and computer numerical control (CNC) programming. Mathematical operations including fractions, exponents, basic algebra and trigonometry will be reviewed. Prerequisite: Basic Mathematics.

**Instructor: R. Eckmann**

**DCB 2064-03** **T** **9/19-10/24** **6:30-8:30pm** **KSU** **\$199**

## **SU** INTRODUCTION TO BLUEPRINT READING

Participants will learn to identify the essential details and interpret the dimensions and tolerances found on engineering drawings. Actual blueprints for hands-on study will be available. This hands-on program will enable participants to accurately and effectively use blueprints to obtain the information they need to do the jobs. Course is geared for machine operators, quality control inspectors, shop supervisors, metalworking manufacturing personnel, engineering managers, and other manufacturing persons interested in learning to read manufacturing prints or updating their knowledge in this area. Prerequisite: Basic Mathematics. **Instructor: R. Engle**

**DCB 1259-08** **R** **10/12-11/16** **6:30-8:30pm** **KSU** **\$249**

Contact Barbara Reer at reerb@sunyulster.edu to learn how you can tailor this program for your employees.

## **SU** ELECTRICAL THEORY I BASICS

Learn electrical theory basics for a variety of professional fields including the manufacturing field. Course will cover basic electrical distribution, identifying and selecting electrical equipment, sizing wires and overcurrent protection, and introduction to the National Electrical Code, installing wires and conduit, theory of series and parallel circuits and measuring voltage and current. This course includes a lab component. **Instructor: K. Crawford**

**DCB 1947-31** **W** **9/20-10/18** **4:30-7:30pm** **KSU** **\$199**

Contact Barbara Reer at reerb@sunyulster.edu to learn how you can tailor this program for your employees.

## **SU** ELECTRICAL THEORY II

This course continues on where Electrical I leaves off and is geared towards those in an advanced manufacturing career pathway. This course includes a lab component.

Prerequisite: Electrical Theory I Basics or equivalent. **Instructor: K. Crawford**

**DCB 2135-01** **W** **10/25-11/15** **4:30-7:30pm** **KSU** **\$199**

## **SU** INDUSTRIAL TECHNOLOGY: MANUFACTURING TECHNOLOGY CERTIFICATE

**36 credits**

This certificate program prepares individuals to enter the manufacturing workforce by teaching basic skills needed in the use of lathes and milling machines, while also providing the educational background for those students who want to continue into a second year of study in Industrial Technology: Manufacturing or Industrial Design.



# ADVANCED MANUFACTURING

## MECHATRONICS

### INTRO TO AUTOMATED PACKAGING SYSTEMS I

Introduction to Automated Packaging Systems will give students the skills they need to enter an entry level position in the packaging industry. Students will learn the skills they need to service and repair a variety of packaging equipment and automated systems. This program emphasizes the troubleshooting of electrical and PLC components on machines. Two course options are available for the PLC training. Students should take or have a strong knowledge of Mechatronics Fundamentals (see above) prior to enrolling in this program. **Additional courses will be offered in spring 2018.**

### OPERATING SYSTEMS & UTILITIES

Students will obtain a mastery of operating systems concepts and a foundation of the boot process in this broad background course. They will apply their skills to maintaining files and learn to build and maintain shell scripts and batch programs. Students have the option of taking this as a credit course or non-credit course.

|             |     |            |             |     |       |
|-------------|-----|------------|-------------|-----|-------|
| CIS 116-01  | M/W | 8/28-12/19 | 11:40am-1pm | SRC | \$603 |
| DCB 2138-01 | M/W | 8/28-12/19 | 11:40am-1pm | SRC | \$603 |

The DCB course is a non-credit option for the 3-credit CIS course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171.**

### NETWORKING FUNDAMENTALS

Students are introduced to the architecture, structure, functions, components and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media and operations are introduced. Students have the option of taking this as a credit course or non-credit course. Prerequisite: Basic Algebra.

|             |     |            |             |     |       |
|-------------|-----|------------|-------------|-----|-------|
| NET 101-01  | T/R | 8/29-10/17 | 9am-12:30pm | SRC | \$603 |
| DCB 2139-01 | T/R | 8/29-10/17 | 9am-12:30pm | SRC | \$603 |

The DCB course is a non-credit option for the 3-credit NET course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. Refer to the current college catalog for complete course descriptions. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171.**

### NEW! COMMERCIAL ELECTRIC - HYBRID

In this course, students learn about the essential components of the electrical systems of commercial buildings. Topics include reading commercial building plans and specifications, computing electrical loads, branch circuits and components, and electronic service equipment. Electrical considerations specific to renewable energy systems are also covered. Required text: Simmons/Mullin, Electrical Wiring – Commercial, 16th Edition, (ISBN-13: 978-1337101882) Materials list: Web cam and mic, ear bud or speakers, non-flammable, non-melting long sleeve shirt and long pants or coveralls (cotton, wool or silk), UV rated safety glasses or goggles, hearing protection, leather gloves. **Instructor: L. Reeger**

|               |   |           |        |  |       |
|---------------|---|-----------|--------|--|-------|
| GRB 230-OX HV | W | 9-11:50am | Hybrid |  | \$603 |
| DCB 2149-01   | W | 9-11:50am | Hybrid |  | \$603 |

The DCB course is a non-credit option for the 3-credit GRB course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171.**

### PROGRAMMABLE LOGIC CONTROLLERS (PLCS) I

This course contains an overview of Allen Bradley controller architecture, hardware, programming, ladder logic and troubleshooting. This course includes a hands-on lab component. Course is appropriate for engineering students who are looking to gain knowledge in this area as well as for engineers looking for professional development hours. Suggested Prerequisite: Electrical Theory (see page 9)

Approved for 24 PDHs. **Instructor: D. Lord**

|             |   |            |       |     |       |
|-------------|---|------------|-------|-----|-------|
| DCB 1024-10 | T | 11/7-12/12 | 5-9pm | KSU | \$599 |
|-------------|---|------------|-------|-----|-------|

Please Refer to the Current College Catalog for Complete Credit Course Descriptions.

# ADVANCED MANUFACTURING

## INTRO TO AUTOMATED PACKAGING SYSTEMS continued

### **SU** INTRODUCTION TO PROGRAMMABLE LOGIC CONTROLLERS (PLCS)

This course will provide the fundamentals of a programmable logic controller (PLC). Hands-on instruction and industrial-type applications of PLCs requiring relay ladder logic control and a study of automated manufacturing and the functions of PLCs in an industrial environment will be provided. Topics include components of a PLC, memory organization, discrete I/O, numbering systems, logic gates, Boolean algebra, relay ladder logic, timers, counters, word level logic and troubleshooting. *Approved for 45 PDHs.*

Suggested Prerequisite: Electrical Theory, MAT 115 or higher. Required textbooks: Programmable Logic Controllers (ISBN: 9352602129) and LogixPro PLC Lab Manual with CD-ROM (ISBN: 0077477995)

**Instructor: C. Marcello**

|             |   |           |         |     |       |
|-------------|---|-----------|---------|-----|-------|
| MFG 115     | S | 9/2-10/28 | 9am-4pm | SRC | \$603 |
| DCB 2155-01 | S | 9/2-10/28 | 9am-4pm | SRC | \$603 |

The DCB course is a non-credit option for the 3-credit MFG course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171.**

### **SU** NEW! BUILDING AUTOMATION & CONTROLS

In this course, students learn the basic principles of building automation and controls for energy management. Topics include control devices, signals, logic, and applications for various systems, such as electrical, lighting, HVAC, plumbing, fire protection, security, access control, voice-data-video, and elevator systems. Required text: NJATC. Building Automation Control Devices and Applications. Homewood, IL: ATP, 2008 (ISBN-13: 978-0826920003)

|               |        |            |  |  |  |
|---------------|--------|------------|--|--|--|
| GRB 210-01 HV | ONLINE | 8/28-12/19 |  |  | \$633   |
| DCB 2150-01   | ONLINE | 8/28-12/19 |  |  | \$633  |

The DCB course is a non-credit option for the 3-credit GRB course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171.**

### **SU** MICROCOMP HARDWARE & TELECOM

Techniques for maintaining personal computer hardware, making simple repairs and establishing preventive maintenance procedures are taught in this course. Students also study telecommunications and networking concepts. Emphasis is on diagnosing problems, assessing needs, making repairs, installing components and testing.

CIS 215-01      Offered January 2018

### **UB** WELDING CERTIFICATION COURSE

This entry level course will provide the training necessary to sit for the American Welding Society (AWS) shielded metal arc welding entry level certification. Includes instruction in welding safety and health, drawing and welding symbol interpretation, shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux cored arc welding, gas tungsten arc welding (GTAW), thermal cutting, plasma arc welding (PAC), and welding inspection and testing. Tuition includes personal welding equipment and materials. AWS testing fees are extra. **Instructors: C. Hubert and R. Salinas**

|              |     |            |       |    |         |
|--------------|-----|------------|-------|----|---------|
| WW112-0918CT | M/W | 9/18-11/29 | 6-9pm | CT | \$1,499 |
| WW112-0919CT | T/R | 9/19-11/30 | 6-9pm | CT | \$1,499 |

### **SU** NEW! ONLINE ENVIRONMENTAL DATA: ACCESSING, PROCESSING & PUBLISHING

This course is a hands-on one-day workshop. It reviews online sources for water resources, flood mapping, landcover, soils and other environmental data. The use of tools such as Google Earth, the USGS National Map and other online map servers to access, process and, publish the data are presented in instructor led exercises. The content will consist of 50% lecture and 50% exercises. This course is intended for engineers, surveyors, geologists, planners, managers and other practicing environmental professionals. *Approved for 7PDHs.* Equipment: Students need to bring a laptop computer with the following software installed: Windows 7, Internet Explorer 11, Google Earth Pro, Adobe Acrobat Reader with TerraGo Toolbar extension, and GPSBabel. **Instructor: T. Barnard**

|             |   |       |               |     |       |
|-------------|---|-------|---------------|-----|-------|
| DCB 2153-01 | W | 10/18 | 8:30am-4:30pm | KSU | \$299 |
|-------------|---|-------|---------------|-----|-------|

# ADVANCED MANUFACTURING

## DRAFTING / AUTOCAD / 3D PRINTING

### DRAFTING FUNDAMENTALS

Students are introduced to graphical representation of the technical language and the use of instruments and scaling. The course also covers geometric construction orthographic projection, sections and conventions, isometric and oblique drawings, and auxiliary views, with emphasis on correct lettering and line work. Students successfully passing this course will receive 3 credits. **Instructor: S. Ligotino**

IND 130            T            8/28-12/19            5-9:30pm            SRC            \$603

### DRAFTING FUNDAMENTALS I

The topics covered in this course are geometric construction and orthographic projection. The topics covered are taught using AutoCAD 2017. Special emphasis is placed on using the software to complete the assignments. **Instructor: S. Ligotino**

DCB 2136-01        T            8/28-10/11            5-9:30pm            SRC            \$299

DCB 2136 and DCB 2137 are non-credit course options for the 3-credit IND course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171**.

### DRAFTING FUNDAMENTALS II

This course expands on topics covered in the first course. Additional topics covered are sections and conventions, and isometric drawings. Special emphasis is placed on using the software to complete the assignments. Prerequisite: Drafting Fundamentals I. **Instructor: S. Ligotino**

DCB 2137-01        T            10/18-12/19            5-9:30pm            SRC            \$299

DCB 2136 and DCB 2137 are non-credit course options for the 3-credit IND course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171**.

### COMPUTER ASSISTED DRAFTING I

This course is an introduction to computer drafting used in industry and professional engineering and architectural offices. Using the AutoCAD platform, emphasis will be on the use of icon commands while stressing basic mechanical and orthographic projection. Related topics include sectioning, dimensioning, blocking, layering, and printing. This course is suggested for those looking to generate files for 3D printer applications. Course is offered as a credit or a non-credit course. **Instructor: S. Ligotino**

IND 201            R            8/28-12/19            4-9:30pm            SRC            \$815

DCB 2151-01        R            8/28-12/19            4-9:30pm            SRC            \$815

The DCB course is a non-credit option for the 4-credit IND course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171**.

### ADVANCED DRAFTING

Focus is on machine parts and furniture design. Students learn techniques of drawing components and assemblies. Calculations for simple design components are calculated assuring a firm base for designing a simple machine element. This course is offered as a credit or non-credit course. Prerequisite: IND 130 or by advisement. **Instructor: S. Ligotino**

IND 135            T/R            8/28-12/19            T: noon-4:30  
R: noon-3:30            SRC            \$815

DCB 2152-01        T/R            8/28-12/19            T: noon-4:30  
R: noon-3:30            SRC            \$815

The DCB course is a non-credit option for the 4-credit IND course. Students will be expected to do all homework assignments and quizzes but no grade will be awarded. For assistance in selecting a course, please contact **SUNY Ulster at 845-802-7171**.

### CERTIFIED SOLIDWORKS® ASSOCIATES PROGRAM

Helping you to design better products, SolidWorks®, 3D CAD software will be a more productive program to use. Ulster BOCES will provide you with an 85-hour computer lab setting to conquer the intricacies of this powerful design tool. Moving to SolidWorks®, you can start attracting the most innovative engineers and designers in the work force today. The course fee includes instruction, lab time, Solidworks® student license and certification exam. Lab opens: 10/3.

MF106-1718CT      T/R            10/3-12/21            4-8pm            CT            \$999

# ADVANCED MANUFACTURING

## **SU** MACHINING & PRODUCTION I 105 hours

Hands-on study of machine shop practices in this course, includes the care of precision instruments, maintenance of lathes and milling machines, operation of lathe controls, filing, deburring, polishing, use of digital readout, use of micrometer, dial indicators, and pitch micrometers.



IND 141      T/R      10/3-1/16      4-8pm      CT

## **SU** MACHINING & PRODUCTION II 105 hours

Advanced functions of a lathe and milling machine, including use of hand and precision tools required for operation, are presented in this course. Prerequisites: IND 141 or equivalent experience

IND 142      T/R      10/3-1/16      4-8pm      CT

## **UB** CNC MACHINE OPERATOR

This is a 96-hour class providing students with entry level CNC (Computer Numerical Control) machine operating skills. The first 12 hours gives the student an introduction to machining including shop safety, blueprint reading; precision measurement and inspection. Students will progress to hands-on CNC machine operation including setup, operation, and tool-holding on CNC lathe and CNC milling machines. The final 24 hours of class time are devoted to learning CNC programming in G and M Codes.

MF202-1718CT      T/R      10/3-1/14      4-8pm      CT      \$999

## **UB** MASTERCAM® ENTRY LEVEL CERTIFICATION

Validate your skills and increase your value in the workplace by training to become certified in Mastercam®, the industry's leading CAM system. In this 82-hour program, you will work on milling, 2-D and 3-D tool path, lathe parts drawing and tool path, wire frame, and solids. At the conclusion of the course, you will sit for the national Mastercam® Certification exam, which includes machining a piece that you have created in wire-frame.

MF105-1718CT      T/R      10/3-12/19      4-8pm      CT      \$999

## **UB** MASTERCAM® PROFESSIONAL LEVEL CERTIFICATION

The Mastercam® Professional Level Certification is a reliable validation of your skills, knowledge, and the application of Mastercam® functionality within a set amount of time. A student should attain the Mastercam® Associate Level Certification before taking the practical Professional Level Certification exam.

MF105-1718CT      T/R      10/3-12/19      4-8pm      CT      \$999

## **UB** G- CODE PROGRAMMING

This 40-hour course is designed for the experienced manual machinist who seeks to learn how to write G-Code programs to control the operation of CNC machines. Basic shop math, computer skills, and machining experience required. Please bring a calculator with trigonometric functions to class.

MF102-1718CT      T/R      10/3-11/2      4-8pm      CT      \$999

## **UB** WELDING CERTIFICATION COURSE

Please refer to page 11 for course description and availability.

The **ULSTER BOCES MANUFACTURING LAB** offers customized enrollment to meet the needs of the employer, employee and employment seeker.

To determine start date, time and tuition obligation call **845-331-5050** to schedule an admissions interview.