Grand Rapids Community College

Course Cover Sheet

M-CAM Training Area:
☐CNC/Machining ☒Multi-Skilled/Mechatronics ☐Production Operation ☐Welding/Fabrications

Program(s): Electrical Controls/Mechatronics Certificate

Course: EL 204

Course Description: Industrial Electronics | 4-credit, 6-contact hour course

Date Created: 2014

Faculty Developer(s)/Instructional Designers(s): Roger Kelley

Employer/Industry Partner: The Right Place, Talent 2025, Kellogg's, Roscam, JR Automation, Kent ISD

College Contact: David Lovell

Phone: 616-234-3168

Email: davidlovell@grcc.edu

Additional Information/Comments:

The Mechatronics one-year certification was developed as a result of 1) The Right Place (GRCC's economic developer) who identified need for this training program to attract advanced Manufacturers to the West Michigan area, 2) Data from Talent 2025 identifying a growing need for Industrial Maintenance employees, and 3) a collaboration with Kent Intermediate School District who was also developing a Mechatronics program from local 11th and 12th graders and wanted to develop a transfer pathway. Employer involved with developing the program were members of the Mechatronics advisory board, including Kellogg's, Roscam Baking, and JR Automation.

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warrantees, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

The eight community colleges and MCAM is an equal opportunity employer/program provider. Auxiliary aids and services are available upon request to individuals with disabilities. TTY users please call 1-877-878-8464 or visit www.michigan.gov/mdcr."

This work is licensed under a Creative Commons Attribution 4.0 International License.

Catalog Search

Search Catalog

Advanced Search

- Catalog Home
- Academic Programs
- Course Codes and Descriptions
- Catalogs (2011-2015)
- President's Welcome
- GRCC Academic Departments & General Office Contact Information
- Accreditations and Memberships
- History of GRCC
- Academic and Student Affairs Vision
- Academic Information
- Michigan Transfer Agreement (MTA)
- Academic Policies and Procedures
- Campus Resources
- Extended Learning Opportunities
- Higher Education Overview
- Continuing Education / Workforce Training
- Job Training
- Independent Study & Project Seminars
- GRCC Employees
- GRCC Campus Map
- My Catalog

[ARCHIVED CATALOG]

EL 204 - Industrial Electronics

(4/6)

Prerequisites: [EL 106 AND EL 107] OR EL 144 Electronics as applied to industrial controls, to include control circuits, PLC's, VFD Drives, PID loops, and different types of control systems. EL 201 is a prerequisite. Six hours lecture/laboratory combination. This course is a capstone course (Final course). An individual project is required.

Recommended Skills: EL 201 AND any Public Speaking Course Six hours lecture/laboratory combination.

Contact Us | Site Map | Privacy Policy | Feedback | Jobs@GRCC | Dashboard
(616) 234-4722

143 Bostwick Avenue NE
Grand Rapids MI 49503-3295

GRCC is an Equal Opportunity Institution. GRCC is a tobacco free campus. © 2011 Grand Rapids Community College

All catalogs © 2017 Grand Rapids Community College. Powered by the Acalog™ Academic Catalog Management System™ (ACMS™).
Mobile Site

EL 204 – Industrial Electronics
Course Syllabus
Winter 2017

12/27/2016

General Information

EL 204 Course Description:
Electronics as applied to industrial controls, to include control circuits, PLC's, VFD Drives, PID loops, and different types of control systems. EL 201 is a prerequisite. This course is a capstone course (Final course) for the Electrical/Electronic programs.
This course is a four hours lecture/lab combination (8 hours per week) for eleven weeks. It meets from 1:15-5:15 PM Mondays, and Wednesdays. EL 204 will meet in Rooms 312 & 301 ATC. We are going to cover a lot of material. You will need to have a plan to be able to study 10-12 hours every week outside the classroom and Lab.

Course #6902
Credits: 4
Contacts: 6
Number of Weeks: 11
Dates: 2/06/2017-4/24/2017
Times: Monday & Wednesday 1:15-5:15 PM
Location: ATC 312/ 301
Last Date to drop (W): 3/31/2017

Instructor Contact Information:

Mr. Roger Kelley – Assistant Professor
Applied Technology
Electrical/Electronics
rkelley@grcc.edu (Best way to communicate.)
Locations: Office Downtown GRCC ATC Building Room 314
Office at Holland MTEC Lab 201
Office Hours: Holland MTEC 5:00-6:00 PM Thursdays
ATC Downtown- 5:00-6:00 PM Monday & Wednesdays
4:30-5:30 PM & 9:30-10:30 Tuesdays
(Always best to make an appointment for office hours.)

Student Learning Outcomes:

- Determine how basic Control devices work and their application.
- Apply motor controls and AC drives
- Compare sensors and Process Control
- Apply Motion Control systems, Steppers and Servos
- Design Process Control systems and applications of PLC's
- Compare different Industrial Processes including Instrumentation
- Understand Industrial Control Networks

Materials Required: MATERIALS NEEDED:
Industrial Automated Systems Instrumentation and Motion Control, 2011, Terry Bartelt, Delmar Cengage Learning. ISBN # 978-1-4354-8888-5

- Calculator: Scientific
- Some materials will be needed to be printed from blackboard.
- Some materials for your project will need to be purchased
- Safety Glasses: Are required while working on "live" equipment over 50 volts

For Unit Objectives, Reading Assignments, and Homework see the Unit Outline Sheets, Schedule on Blackboard, & Term sheets.

Prerequisites:
Completion of EL106 & EL107 (or EL144 and EL162) and EL201 are prerequisites.
Completion of EL132 or MA104 or higher.
Technical Reading skill needs to be at a college level.

Section policy

Attendance:

Regular attendance and participation in class is essential. While I recognize that circumstances sometimes prevent students from attending, the college administration sees absenteeism as a very serious matter. The College makes no distinction between "excused" and "unexcused" absences and neither do I. If students are not present in a class in which they are enrolled they are simply absent, regardless of the reason. Points will be deducted for every lecture not attended. Coming late or leaving early will also result in points being deduced from your total. "Attend" means that you are present in the physical classroom or lab during the scheduled time. A phone call, e-mail, office visit, access to Blackboard, assignment submission, or any other attempt to contact or communicate shall not be considered attendance (although communication with me is appreciated).
For every Class missed twenty points will be deducted from your total regardless of the reason. For arriving late, or leaving early there will be ten points deducted from your total. There will be no Lab or Quiz make-ups.

Assessments: (Estimated)

Lab Reports	16%	160	16 labs 10 points each
Unit Tests	25%	250	5 unit tests 50 points each
*Final Exam	10%	100	
*Homework BB	12%	120	6 units 20 points each
Homework Terms	12%	120	6 units 20 points each
Capstone Project	12%	120	
**Engagement	13%	130	
	100%	1000	

* A minimum of 70% in each category must be obtained to pass this course.
** Engagement will include Activities, Quizzes, or Exercises
Lack of on-time Attendance will reduce your points

Extra Credit

You should plan on there being NO extra-credit during this course.

Grades:

All grades will be posted on blackboard and will be current within one week. Grades will not be changed two weeks after they are posted.

Partial and selective grading will be used (not everything is worth the same points).

Blackboard:

This class uses Blackboard® (http://bb.grcc.edu). You will need to use Blackboard to access assignments, course materials, and to check your grades.
See Blackboard for an orientation.

Grading Scale: NOTE: 70% is passing

A = 100-95%
A- = 94.9-93%
B+ = 92.9-91%
B = 90.9-87%
B- = 86.9-85%
C+ = 84.9-83%
C = 82.9-79%
C- = 78.9-77%
D+ = 76.9-75%
D = 74.9-72%
D- = 71.9-70%
E = 69.9 -0%

Expectations/Disabilities:

I have an expectation that you will work hard and engage in learning. If there is any reason you feel you cannot earn an "A" in this course, such as physical or learning disabilities, please email or see me in person during the first week of class.

Homework:

Some homework is required to be done on Blackboard. Blackboard Homework is due by 10:00 PM on the day listed on the schedule. Late blackboard homework will NOT be graded. Terms homework (non-blackboard) will also be due on day on scheduled late points will be deducted the same as listed below.

Engagement:

Activities may include some on-line research, reports, special/extra homework. Activities are due the day announced in class. Activities that are late will have points reduced. If they are turned in after the start time of the due date until one class day beyond the due date 25 % off of possible. Two class days your grade will be reduced by 50%. Any later, zero points will be given. Quizzes are normally unannounced and will be on lecture, homework, textbook, or lab material. There will be NO make-up quizzes.

Cell Phones/Classroom:

Any storage devices including graphing calculators and cell phones will NOT be allowed for tests or quizzes. The use of cell phones, pagers, etc. continues to be a problem in the classroom. Their use in a classroom environment demonstrates a lack of respect for both the instructor and the rest of the class. In order not to disturb the classroom environment, please turn them off and put them away. If the occasion arises and you need to utilize such devices due to a personal situation, please leave the room. No audio or video electronic devices are to be used during class. Covered drinks will be allowed however no food in the Classroom. The classroom door will be closed during class. If you are late and need in please wait by the door until it is opened for you.

Final Tests:

Will be given on April 24 (Monday) at 1:15 PM

Unit Tests:

Unit tests will cover any material including textbook, reference books, lecture, or handed out material. Unit Tests will be limited to 60 minutes and done in class. Unit Tests must be made-up prior to the next class session. Contact me to arrange a time and place. No Unit test will be given after the next class meeting. A ten page essay can be used as a replacement for an Unit test make-up by my discretion.

College Policies

GRCC Email and Course Communications

You are responsible for all communications sent via Blackboard and to your GRCC email account. You are required to use your GRCC provided email account for all email communications at the College. You may access your GRCC student email account through Student Email (http://email.grcc.edu) and your Blackboard account through Blackboard (http://bb.grcc.edu).

Disability Support Services

If you need an accommodation for a disability, contact Disability Support Services (www.grcc.edu/dss) in Room 368 of the Student Center or at (616) 234-4140 to discuss disability documentation and how to register. You will be assigned a DSS counselor/advisor who will create an Accommodations Agreement that you will present to me and we will work together to provide you the appropriate accommodations. If you believe that you have a disability but do not have documentation, contact DSS to discuss options.

Student Code of Conduct

You are held accountable to the Student Code of Conduct (www.grcc.edu/studentconduct/studentcodeofconduct), which outlines expectations pertaining to academic honesty (including cheating and plagiarism), classroom conduct, and general conduct.

Title IX Reporting Policy

If you or another student are the victim of any form of sexual misconduct (including dating/domestic violence, stalking, sexual harassment), or any form of gender discrimination, GRCC can assist you. You can report a violation of our sexual misconduct policy (www.grcc.edu/sexualmisconduct) directly to our Title IX Coordinator at (616) 234-3169. You may also report the issue to a faculty member, who is required to notify the Coordinator, or you may make an appointment to speak confidentially to our Counseling and Career Center by calling (616) 234-3900.

Campus Police/Emergency Resources

You may review emergency services and resources at the GRCC Campus Police website (www.grcc.edu/campuspolice). Campus Police can be reached using the 'Code 2' button on any campus phone or by dialing x4911 on campus or (616) 234-4911 off campus. Dial 911 for off campus emergencies.

Changes to the Syllabus

I reserve the right to change the contents of this syllabus due to unforeseen circumstances. You will be given notice of relevant changes in class, through a Blackboard Announcement, or through GRCC e-mail.

EL 204 1:15-5:15 PM

Schedule Winter 2017

12/27/2016

2017 Date	Unit	Lab	Text. Chapters	Unit Topics	Homework Terms	HW on BB	Unit Test	ENG. HW
2/6 MON.	1	1	Intro & 1	***Control Systems***				
2/8 WED.	1	2	2&3	***Mechatronics Interfaces & Thyristors***				
2/13 MON	1	3	4	***Controller Operations***	Unit 1 Terms 1,2,3,4	Unit 1 HW #1		
2/15 WED	2	4	5 & *6	**Motors & AC Drives**			Unit 1	1
2/20 MON	2	5	8 & *9	**AC Drives**				
2/22 WED	2	6		**AC Drives**	Unit 2 Terms 5,6,8,9	Unit 2 HW #2		
2/27 MON.	3	7	19	***Sensors - Sinking/Sourcing***			Unit 2	2
3/1 WED.	3	8	10-12	**Electronic Sensors**	Unit 3 Terms 10-15 & 19	Unit 3 HW #3		
Spring Break								
3/13 MON	3	9	13-15	***Encoders***	Project Objectives- write up		Unit 3	3
3/15 WED	4	10	21	***Mechatronics & PLCs***	Project Part lists and Data sheets			
3/20 MON	4	11	22	***Mechatronics & PLCs***				
3/22 WED	4	12	23	***PLC's 5000***	Unit 4 terms 20-23	Unit 4 HW#4	Unit 4	
3/27 MON	4			Make-up (Projects)	Project Spec's			4
3/29 WED	5	13	24 & 25	***Servo's and Controls***	Project Prints			
4/3 MON.	5	14	7 & 17	**Mechatronics/Automation**	Project Write ups			
4/5 WED.	5	Proj	26	***PID Control***	Unit 5 terms7,17,24,25,26	Unit 5 HW #5	Unit 5	
4/10 MON.	5	Proj						5
4/12 WED.	6	15	16 & 18	Project Presentations				
4/17 MON	6	16	16 & 18	***Networks***	Project Presentations			
4/19 WED	6		20,27,29	**Instrumentation**	Unit 6 terms 16,18,29,27	Unit 6 HW #6		
4/24 MON				**Final**	**make up**			

This schedule is subject to change as needed. See BlackBoard for current revision.

Subject Matter Expert (SME) Course Review Summary

College: Grand Rapids Community College

M-CAM Training Area: ☐CNC/Machining ■Multi-Skilled/Mechatronics ☐Production Operation ☐Welding/Fabrication

Degree Program Name: Electrical Controls/ Mechatronics Certificate.

Title of Course: EL 204 - Industrial Electronics

Subject Matter Expert (SME) Reviewer Information

Name: Ben Smith, Kate Puisis
Title: Controls Tech Manager & Talent Recruiter
Phone: (616) 337-9747
Email: bsmith@jrauto.com; Kpuisis@jrauto.com
Organization/Affiliation: JR Automation

Attach Resume or provide credentials (showing years of experience and work experience that is relevant to course content):

Synopsis of Findings:

Outcomes look solid

Reviewers Signature _____ Date: 3/13/17

Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review

1. Course Overview and Objectives	Exceptional	Satisfactory	Ineffective
The goals and purpose of the course is clearly stated.		X	
Prerequisites and/or any required competencies are clearly stated.		X	
Learning objectives are specific and well-defined.		X	
Learning objectives describe outcomes that are measurable.		X	
Outcomes align to occupational focus (industry skills and standards).		X	

Comments or recommendations:
looks good!

2. Material and Resources	Exceptional	Satisfactory	Ineffective
The instructional materials contribute to the achievement of the course learning objectives.			X- see below
The materials and resources meet/reflect current industry practices and standards.			X-see below
The instructional materials provide options for a variety of learning styles.			X-see below
Resources and materials are cited appropriately. If applicable, license information is provided.			X-see below

Comments or recommendations:
Not seeing specific materials, hoping instructional style mirrors/prepares students for work environment. They will be expected to learn hands-on by employers.

3. Learning Activities	Exceptional	Satisfactory	Ineffective
Provide opportunities for interaction and active learning.		X	
Help understand fundamental concepts, and build skills useful outside of the learning object.		X	
Activities are linked to current industry practices and standards.		X	

Comments or recommendations:
I think the capstone project should be worth more. That will be the closest experience they have to real world projects

Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review

4. Assessment Tools/Criteria for Evaluation	Exceptional	Satisfactory	Ineffective
The course evaluation criteria/course grading policy is stated clearly on syllabus.		X	
Measure stated learning objectives and link to industry standards.		X	
Align with course activities and resources.		X	
Include specific criteria for evaluation of student work and participation.		X	
Comments and recommendations: See previous comment			

5. Equipment/Technology	Exceptional	Satisfactory	Ineffective
Meets industry standards and needs.			X - See below
Supports the course learning objectives.			X - See below
Provides students with easy access to the technologies required in the course/module.			X - See below
Comments and recommendations: I don't see an equipment list, but Autocad electrical and Allen Bradley or Siemens would be solid technology for students to get experience in.			

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warrantees, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

The eight community colleges and MCAM is an equal opportunity employer/program provider. Auxiliary aids and services are available upon request to individuals with disabilities. TTY users please call 1-877-878-8464 or visit www.michigan.gov/mdcr."

This work is licensed under a Creative Commons Attribution 4.0 International License.

2nd

Kate Puisis

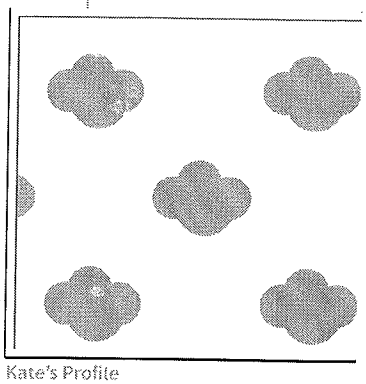
Talent Acquisition Recruiter at JR Automation

JR Automation • Grand Valley State University

Holland, Michigan • 500+ ⁂

Send InMail | Connect

I am an in-house Talent Acquisition Recruiter for JR Automation Technologies in Holland, MI, Stevensville, MI, and Pickens, SC. As JR continues to expand our automation expertise, multi-industry experience, and interna... See more



Kate's Profile

Show more

Highlights

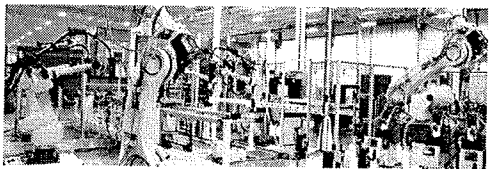
5 Mutual Connections

You and Kate both know Cindy Clark, Daniel Mac Naughton, MISI, and 3 others

Kate's Articles & Activity

1,948 followers

+ Follow



Opportunities with a Growing Company!

Kate Puisis on LinkedIn

December 8, 2016

See 1 more article

Meijer Leapfrogs Midwest Rivals In Rolling Out Home Delivery

Kate liked

This is a great organization in West Michigan.

Kate liked

Switch opens 'most advanced data campus' in former Steelcase pyramid

Kate liked

See all activity

Experience

Talent Acquisition Recruiter

JR Automation

Jan 2014 – Present • 3 yrs 3 mos • Holland, MI

Technical Talent Acquisition and Marketing Specialist

Epoch Robotics

Jan 2014 – Dec 2016 • 3 yrs

Technical Writer

JR Automation

Apr 2012 – Jan 2014 • 1 yr 10 mos

Grand Valley State University
Bachelor of Arts (B.A.), Professional Writing & American Popular Culture
2009 – 2010

Michigan State University
Bachelor's Degree, Rhetoric and Composition/Writing Studies
2005 – 2008

Featured Skills & Endorsements

Technical Writing · 39 — Endorsed by 16 of Kate's colleagues at JR Automation

Customer Service · 36 — Endorsed by 13 of Kate's colleagues at JR Automation

Editing · 32 — Endorsed by 13 of Kate's colleagues at JR Automation

View 29 more

Accomplishments

4 **Certifications**
Recruiter

See more certifications

Following

C++ and Systems Engineers. Software Engineering Freelancers and Professionals
4,446 members

Schneider Electric
883,864 followers

C# Developers / Architects
213,904 members

J.T. O'Donnell
Founder & CEO - WorkItDaily.com | HR | Recruiting | Employment | Speaker | Trainer | Career Coach | Job Search
1,667,868 followers

Clemson University Tigers
1,192 members

Rockwell Automation
186,346 followers

See more

LinkedIn Corporation © 2017