

	<b>Presenter</b>	<b>Action</b>
<b>1. Welcome and Introductions</b>	<b>Chair</b>	
<b>2. Approval of Minutes</b>	<b>Chair</b>	Approval
<b>3. Consent Agenda</b> a. Course Number Changes b. Course Title Change c. Reviewed Outlines for Approval	<b>Chair</b>	Approval
<b>4. Course and Program Approvals</b> a. <b>Course Hours, Credit Change:</b> MUS-189 b. <b>New Course:</b> ENG-243  c. <b>Organic Farming CC Amendment</b> d. <b>Course Inactivation:</b> BA-222 e. <b>Welding Amendments</b> a. Welding Technology AAS b. Entry Level Welding Technician CPCC f. <b>MFG Course Inactivations</b> a. MFG-111, 112, 113, 200, 201, 202, 203, 204, 205, 206, 210, 211	<b>Curriculum Office</b> <b>James Bryant-Trerise</b>  <b>Chris Konieczka</b> <b>Joan San-Claire</b> <b>John Phelps</b>  <b>Mike Mattson</b>	Approval/22.SU Approval/22.SU  Approval/22.SU Approval/22.SU Approval/22.SU  Approval/22.SU
<b>5. Old Business</b> a. Alternate Chair b. ISP 161 Course Creation, Edits, Inactivation, and Reactivation	<b>Chair</b> <b>Dru Urbassik</b>	Info  Info
<b>6. New Business</b> a. ISP 181 Related Instruction b. Course Review Helpful Tips i. Library Resources ii. Gen Ed SLOs c. CourseLeaf Testing	<b>Dru Urbassik</b> <b>Chair</b>  <b>Dru Urbassik</b>	Info Info  Info
<b>7. Closing Comments</b> a.		

**Present:** ASG (Benjamin Melles), Dustin Bare, Nora Brodnicki, Rick Carino, Amanda Coffey, Jeff Ennenga, Megan Feagles (Recorder), Eden Francis, Sharron Furno, Sue Goff, Kerrie Hughes (Alternate Chair), Jason Kovac, Kara Leonard, Lupe Martinez, Patricia McFarland, Tracy Nelson, David Plotkin, Scot Pruyn (Chair), Lisa Reynolds, Terrie Sanne, Charles Siegfried, Tara Sprehe, Sarah Steidl, Dru Urbassik, Andrea Vergun, Helen Wand, Jim Wentworth-Plato

**Guests:** Emily Cavaliere, Britany Ellerbrook, Kelly Love, Joan San-Claire, Shelly Tracy

**Absent:** George Burgess, Elizabeth Carney, Bev Forney, Dawn Hendricks, Shalee Hodgson, Alice Lewis, Mike Mattson, Cynthia Risan

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**1. Welcome & Introductions**

**2. Approval of Minutes**

- a. Approval of the April 1, 2022 minutes

*Motion to approve, approved*

**3. Consent Agenda**

- a. Course Number Changes  
b. Course Title Change  
c. Reviewed Outlines for Approval  
i. Updated ESR-173 outline to include transferability to PSU and OIT

1. *MCF updated outline and reuploaded Agenda Packet to website on 4/15/22*

*Motion to approve, approved*

**4. Course and Program Approvals**

**a. Accounting Amendments**

Joan San-Claire presented

i. Accounting AAS

1. Replacing BA-104 with MTH-050 or higher, removed BA-156, Added LIB-101 as an elective option. No total credit change  
2. Adding MTH-105 to electives. Adding language to MTH-050 about transferability.  
3. *MCF updated and reuploaded Agenda Packet to website on 4/15/22*

*Motion to approve, approved*

ii. Accounting Clerk CC

1. Replacing BA-104 with MTH-050 or higher, removed BA-156, Added LIB-101 as an elective option. Total credits change from 45 to 45-48  
2. Adding language to MTH-050 about transferability.  
3. *MCF updated and reuploaded Agenda Packet to website on 4/15/22*

*Motion to approve, approved*

**b. Apprenticeship Changes**

Shelly Tracy presented

i. Credits/Hours Changes: APR-128UL, APR-138UL

1. Both changing from 1 credit, 24 LE/LA to 2 credits, 40 LE/LA  
2. hours were increased for more in depth study of the same major topics

*Motion to approve, approved*

ii. Amendments

1. Construction Trades, General Apprenticeship AAS  
a. Changing Computation Related Instruction to be 3-5 credits instead of 4-5  
b. Adjusting Painter elective credits  
2. Construction Trades, General Apprenticeship CC  
a. Changing Computation Related Instruction to be 3-5 credits instead of 3-4  
b. Total credits change from 59-62 to 59-63  
3. Electrician Apprenticeship Technologies AAS  
a. Changing Computation Related Instruction to be 3-5 credits instead of 4-5  
b. Adjusting electives so students only have to take 90 total credits for most of the programs.

- c. Total credits change from 90-102 to 90-94
- 4. Electrician Apprenticeship Technologies CC
  - a. Changing Computation Related Instruction to be 3-5 credits instead of 3-4
  - b. Total Credits change from 45-58 to 45-59.
- 5. Industrial Mechanics and Maintenance Technology Apprenticeship AAS
  - a. Total credits change from 90-94 to 90. Adjusting elective credits so students only have to take 90 total credits for the program.

*Motion to approve, approved*

c. **New Courses**

- i. CS-153
- ii. Rick Carino presented
- iii. Industry certification change. Cisco moved from 2-course certification to 3-course.

*Motion to approve, approved*

**5. Old Business**

- a. Review Membership
- b. Alternate Chair for 2 year term.
  - i. Jason, Kerrie, Scot, and Dru will meet to discuss outreach to folks about volunteering to be Alternate Chair.

**6. New Business**

- a. **ISP 161 Course Creation, Edits, Inactivation, and Reactivation**
  - i. Dru Urbassik presented
  - ii. Adding in information about designating how the General Education outcomes align with the Student Learning Outcomes
  - iii. Dru will bring back to ISP to update with Related Instruction info.
- b. **FYE Data and Including FYE in program**
  - i. Kelly Love and Lupe Martinez presented
  - ii. Looking at updated FYE data regarding student Credit Momentum, Student Retention, and Time to Completion. Students who took FYE did better than students who didn't in all three categories.
  - iii. Is there a way to ask departments to consider adding FYE-101 to their programs during the amendment process before approval?
    - 1. "Has FYE-101 been added. If not, why?"
    - 2. How would departments add the course if not every student is required to take it?
      - a. If it's part of the program, but the student doesn't have to take it, they can get it waived, but would need to make up the credits
- c. **Course Review Helpful Tips**
  - i. Library Info
  - ii. Gen Ed in SLOs
  - iii. Bring for next meeting. Ran out of time.

**7. Closing Comments**

- a.

*-Meeting Adjourned-*

**Next Meeting: May 6, 2022 (8-9:30am)**

**1. Course Title Change**

Course	Current Title	Proposed Title

**2. Course Number Change**

Course	Title	Proposed Course Number

**3. Outlines Reviewed for Approval**

Course	Title	Implementation
LIB-101	Introduction to Library Research	2022/SU
WLD-250	Welding Fabrication I Beginning Project	2022/SU

**Clackamas Community College**  
Online Course/Outline Submission System

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**Section #1 General Course Information**

**Department:** LIBR

**Submitter**

First Name: Jane  
Last Name: Littlefield  
Phone: 3474  
Email: jane.littlefield

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**Course Prefix and Number:** LIB - 101

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**# Credits:** 1

**Contact hours**

Lecture (# of hours): 11  
Lec/lab (# of hours):  
Lab (# of hours):  
Total course hours: 11

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Introduction to Library Research

**Course Description:**

Introduces and strengthens college-level research skills. Students will build an understanding of strategies for finding, evaluating, and using information responsibly. Prepares students for success in research-based college assignments and real-life research needs.

---

**Type of Course:** Lower Division Collegiate

Is this class challengeable?

**No**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** CJA

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**Yes (A 'Yes' certifies you have talked with the librarian and have received approval.)\***

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Summer**

✓ **Fall**

✓ **Winter**

✓ **Spring**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. practice information searching skills across multiple formats and tools;
2. evaluate information resources for credibility and suitability for college-level coursework;
3. demonstrate ethical and socially-responsible creation and use of information.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. Introduction to the research process.
2. Introduction to developing a basic research topic.
3. Developing effective keywords.
4. Effective use of the CCC Library Catalog to identify and access full-text resources relevant to a research topic.
5. Effective use of academic databases (including search limits) to identify and access full-text articles relevant to a research topic.
6. Effective use of search engines for finding credible online information.
7. Evaluation of information resources for credibility and relevancy for information needs.
8. Introduction to responsible information use, including citing sources and avoiding plagiarism.

**Does the content of this class relate to job skills in any of the following areas:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

### **Section #2 Course Transferability**

Concern over students taking many courses that do not have a high transfer value has led to increasing attention to the transferability of LDC courses. The state currently requires us to certify that at least one OUS school will accept a new LDC course in transfer. Faculty should communicate with colleagues at one or more OUS schools to ascertain how the course will transfer by answering these questions.

1. Is there an equivalent lower division course at the University?
2. Will a department accept the course for its major or minor requirements?
3. Will the course be accepted as part of the University's distribution requirements?

If a course transfers as an elective only, it may still be accepted or approved as an LDC course, depending on the nature of the course, though it will likely not be eligible for Gen Ed status.

Which OUS schools will the course transfer to? (Check all that apply)

- ✓ EOU (Eastern Oregon University)
- ✓ PSU (Portland State University)
- ✓ OIT (Oregon Institute of Technology)
- ✓ SOU (Southern Oregon University)
- ✓ OSU (Oregon State University)
- ✓ UO (University of Oregon)
- ✓ OSU-Cascade
- ✓ WOU (Western Oregon University)

Identify comparable course(s) at OUS school(s)

LIB101 (UO), LIB127 (EOU), LIB1XX (WOU)  
Other schools it transfers as a LDT elective credit.

How does it transfer? (Check all that apply)

✓ general elective  
:

First term to be offered:

Next available term after approval  
:

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**Clackamas Community College**  
Online Course/Outline Submission System

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**Section #1 General Course Information**

**Department:** AUWD

**Submitter**

First Name: Dustin

Last Name: Bates

Phone: 3973

Email: dustinb

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**Course Prefix and Number:** WLD - 250

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**# Credits:** 4

**Contact hours**

Lecture (# of hours):

Lec/lab (# of hours): 88

Lab (# of hours):

Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Welding Fabrication I Beginning Project

**Course Description:**

This course consists of lecture and lab and provides instruction in fabrication techniques including blueprint reading, layout, sketching, bills of material, job cost calculations, measuring, fitting, cutting and welding. Students will be assigned beginning fabrication projects. The student will be responsible for all aspects of managing the project to successful completion.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Welding AAS

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** WLD-111, WLD-113, or WLD-115

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

## ✓ Not every term

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. recognize and demonstrate how to prevent safety hazards in the shop,
2. identify what type of personal protective equipment is needed for a job,
3. interpret and draw basic blueprint welding symbols,
4. write up a bill of materials,
5. estimate the cost of a job,
6. choose the appropriate welding process for a job,
7. apply layout techniques,
8. measure and cut accurately,
9. fabricate projects while staying within tolerances.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Shop safety.
2. Measuring.
3. Jigs and fixtures.
4. Blueprint reading.
5. Finishing.
6. Welding symbols.
7. Final inspection.
8. Shop math.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |            |
|--------------------------------------|------------|
| 1. Increased energy efficiency       | <b>No</b>  |
| 2. Produce renewable energy          | <b>No</b>  |
| 3. Prevent environmental degradation | <b>Yes</b> |
| 4. Clean up natural environment      | <b>No</b>  |
| 5. Supports green services           | <b>No</b>  |

Percent of course: 5%

First term to be offered:

**Next available term after approval**

:

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**May 6, 2022**

<b>Course</b>	<b>Current Hours/Credits</b>	<b>Proposed Hours/Credits</b>
MUS-189	10 LECT/1 Credit	11 LECT/1 Credit

**Clackamas Community College**  
Online Course/Outline Submission System

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**Section #1 General Course Information**

**Department:** Music

**Submitter**

First Name: Lars  
Last Name: Campbell  
Phone: 3384  
Email: lars.campbell

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**Course Prefix and Number:** MUS - 189

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**# Credits:** 1

**Contact hours**

Lecture (# of hours): 11  
Lec/lab (# of hours):  
Lab (# of hours):  
Total course hours: 11

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Performance & Repertoire

**Course Description:**

A performance forum required for all students studying a classical instrument or voice at the MUP 171-191 and MUP 271-291 levels. Through weekly performance and critique, each student will develop proper stage manners and prepare for the end of term performance jury, and will also study the work to be performed through academic research. Students will have an opportunity to work with a professional accompanist. May be repeated for up to 6 credits.

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**Type of Course:** Lower Division Collegiate

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**Yes**

**Up to how many credits can this course be repeated to satisfy a degree requirement?** 6

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s): AS in Music**

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

- ✓ **Fall**
- ✓ **Winter**
- ✓ **Spring**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. exhibit self-evaluation and musical growth;
2. demonstrate rehearsal and performance etiquette;
3. demonstrate musical professionalism;
4. demonstrate constructive criticism of other students' performances;
5. perform a successful jury at the end of the term.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Preparing for a performance.
2. Student performances.
3. Jury.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

## **Section #2 Course Transferability**

Concern over students taking many courses that do not have a high transfer value has led to increasing attention to the transferability of LDC courses. The state currently requires us to certify that at least one OUS school will accept a new LDC course in transfer. Faculty should communicate with colleagues at one or more OUS schools to ascertain how the course will transfer by answering these questions.

1. Is there an equivalent lower division course at the University?
2. Will a department accept the course for its major or minor requirements?
3. Will the course be accepted as part of the University's distribution requirements?

If a course transfers as an elective only, it may still be accepted or approved as an LDC course, depending on the nature of the course, though it will likely not be eligible for Gen Ed status.

Which OUS schools will the course transfer to? (Check all that apply)



**Identify comparable course(s) at OUS school(s)**

**How does it transfer? (Check all that apply)**

:

**First term to be offered:**

**Next available term after approval**

:

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Course Number	Title	Implementation
ENG-243	African Mythology	2022/SU

**Clackamas Community College**  
Online Course/Outline Submission System

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**Section #1 General Course Information**

**Department:** ENGL

**Submitter**

First Name: James  
Last Name: Bryant-Trerise  
Phone: 5035943255  
Email: jamesb

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**Course Prefix and Number:** ENG - 243

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**# Credits:** 4

**Contact hours**

Lecture (# of hours): 44  
Lec/lab (# of hours):  
Lab (# of hours):  
Total course hours: 44

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

---

**Course Title:** African Mythology

**Course Description:**

Explores African mythology and its cultural, social, and literary significance; views African mythology in its historical and geographic positions and in the larger context of global literary traditions; introduces theoretical approaches to mythology and basic literary elements and terminology; considers how studying myth affects and influences reading other works; connects African myth to African-American culture and literature.

---

**Type of Course:** Lower Division Collegiate

**Reason for the new course:**

A major reason for this course is to continue to diversify our curriculum. The mythology courses have become a tradition in the English Department, having been started over 30 years ago by Jan Anderson and Allen Widerburg, but for a while the offerings were mostly focused on European mythologies. Over time we have gradually expanded globally, and this proposed course continues that effort. This course in particular is needed because knowledge of anything African is, in general, woefully inadequate despite the continent's being the 2nd-largest on Earth and containing 16% of its population. If myth and legend are part of what goes into understanding people and art, then to neglect African myth and legend is to sideline African peoples and their art, expression, and intelligence.

Is this class challengeable?

**No**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**Yes**

**Check which General Education requirement:**

**✓ Arts and Letters**

**✓ Cultural Literacy**

Is this course part of an AAS or related certificate of completion?

**No**

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** WRD-098 or placement in WR-121

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**Yes (A 'Yes' certifies you have talked with the librarian and have received approval.)\***

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Not every year**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. demonstrate a perception of African mythology as a phenomenon of literary, cultural, aesthetic, political, and religious importance via their writing, discussion, and exams; (AL1) (AL2) (CL1)
  2. explain the geographic and literary origins of African mythology in writing and discussions; (AL1) (AL2) (CL1)
  3. identify and analyze, using writing and discussion, similarities and differences among African myths themselves and works of literature in other genres, as well as other works of art, forms of communication, and personal experience; (AL1) (AL2) (CL1)
  4. habituate themselves to the practice of active learning and collegial collaboration as the path to intellectual discovery, using skills such as close reading, note taking, research, discussion, presentation, questioning, and listening; (AL2)
  5. articulate in writing and discussion how knowledge of African mythology reflects and enables awareness of the diversity of human expression, meaning-making, and power structures; (CL1]
  6. construct and defend interpretations of African mythology based on class discussion and independent literary research; (AL1)
  7. write a well-organized and carefully edited paper using terms, definitions, and myth theory appropriately to analyze and/or compare elements of one or more myths. (AL1)
-

## COURSE OUTLINE MAPPING CHART

**Mark outcomes addressed by the course:**

- Mark "C" if this course completely addresses the outcome. Students who successfully complete this course are likely to have attained this learning outcome.
- Mark "S" if this course substantially addresses the outcome. More than one course is required for the outcome to be completely addressed. Students who successfully complete all of the required courses are likely to have attained this learning outcome.
- Mark "P" if this course partially addresses the outcome. Students will have been exposed to the outcome as part of the class, but the class is not a primary means for attaining the outcome and assessment for general education purposes may not be necessary.

**As a result of completing the AAOT/ASOT general education requirements, students will be able to:****WR: Writing Outcomes**

- P** 1. Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences.
- P** 2. Locate, evaluate, and ethically utilize information to communicate effectively.
- P** 3. Demonstrate appropriate reasoning in response to complex issues.

**SP: Speech/Oral Communication Outcomes**

- P** 1. Engage in ethical communication processes that accomplish goals.
- P** 2. Respond to the needs of diverse audiences and contexts.
3. Build and manage relationships.

**MA: Mathematics Outcomes:**

1. Use appropriate mathematics to solve problems.
2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.

**AL: Arts and Letters Outcomes**

- S** 1. Interpret and engage in the Arts & Letters, making use of the creative process to enrich the quality of life.
- S** 2. Critically analyze values and ethics within range of human experience and expression to engage more fully in local and global issues.

**SS: Social Science Outcomes**

1. Apply analytical skills to social phenomena in order to understand human behavior.
2. Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.

**SC: Science or Computer Science Outcomes**

1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions.
2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically examine the influence of scientific and technical knowledge on human society and the environment.
3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.

- S** 1. Identify and analyze complex practices, values, and beliefs and the culturally and historically defined meanings of difference.

Outcomes Assessment Strategies:

- ✓ Presentations
  - ✓ Thesis/Research Project
  - ✓ Criteria
  - ✓ Rubrics
  - ✓ Journal Writing
- ✓ Projects
  - ✓ Writing Assignments

:

Major Topic Outline:

1. The origins and development of African myth and legend.
2. Cultural background, especially myth as performance.
3. The diversity of African pantheons.
4. African epics.
5. African mythological themes.
6. Modern versions of African myth and legend.
7. Myth theory.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

**Section #2 Course Transferability**

Concern over students taking many courses that do not have a high transfer value has led to increasing attention to the transferability of LDC courses. The state currently requires us to certify that at least one OUS school will accept a new LDC course in transfer. Faculty should communicate with colleagues at one or more OUS schools to ascertain how the course will transfer by answering these questions.

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If a course transfers as an elective only, it may still be accepted or approved as an LDC course, depending on the nature of the course, though it will likely not be eligible for Gen Ed status.

Which OUS schools will the course transfer to? (Check all that apply)

- ✓ EOU (Eastern Oregon University)
- ✓ OSU (Oregon State University)
- ✓ OSU-Cascade
- ✓ PSU (Portland State University)
- ✓ SOU (Southern Oregon University)
- ✓ UO (University of Oregon)
- ✓ WOU (Western Oregon University)

Identify comparable course(s) at OUS school(s)

None located; OUS schools have traditional myth courses (e.g., Greek) but lack this specific focus. However, PSU and UO both have African Studies programs.

How does it transfer? (Check all that apply)

- ✓ **required or support for major**
- ✓ **general education or distribution requirement**
- ✓ **general elective**
- :

Provide evidence of transferability: (minimum one, more preferred)

✓ **Other. Please explain.**

OSU's web site (at <https://admissions.oregonstate.edu/baccalaureate-core-course-equivalencies-clackamas-community-college>) shows our mythology courses transferring as Lower Division Transfer; there is no reason to think this new course would be any different. More importantly, with the advent of the AAT in English Literature, which satisfies the MTM for English, all 200-level ENG classes designated as meeting the statewide criteria for Arts and Letters will meet Core Transfer Map and major-specific requirements for the major.

First term to be offered:

**Specify term:** 2023 Sp

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Program	Implementation
Organic Farming CC	2022/SU



## COMMUNITY COLLEGE PROGRAM AMENDMENT FORM

(For changes to State Approved Associate of Applied Science degree, AAS option and Certificate of Completion programs)

**This form should be completed electronically and the boxes will expand to accommodate text.**

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<http://www.ode.state.or.us/search/results/?id=231>

<b>College:</b>	Clackamas Community College	<b>Date</b>	
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### CAREER LEARNING AREA

<input type="checkbox"/> Ag, Food & Natural Resource Systems	<input type="checkbox"/> Health Services
<input type="checkbox"/> Arts, Information & Communications	<input type="checkbox"/> Human Resources
<input type="checkbox"/> Business & Management	<input type="checkbox"/> Industrial & Engineering Systems

### PROGRAM INFORMATION

<u>APPROVED</u> Program Title	<u>APPROVED</u> CIP Code (Include 7 <sup>th</sup> & 8 <sup>th</sup> digits used for OCCURS reporting.)			<u>APPROVED</u> Recognition Award	Current Credits
(For Official Program Title, refer to your directory at <a href="http://www.ode.state.or.us/search/results/?id=232">http://www.ode.state.or.us/search/results/?id=232</a> )	6-digit CIP	7 <sup>th</sup> digit	8 <sup>th</sup> digit		
	<b>AAS Title:</b>				<input type="checkbox"/> Associate of Applied Science (AAS) Degree
<b>Option Title**</b>				<input type="checkbox"/> OPTION to AAS Degree	
<b>Certificate Title:</b> <i>Within</i> AAS Degree? <input type="checkbox"/> Yes** <input checked="" type="checkbox"/> No <b>Organic Farming</b> CC.ORGANICFARM	1.0304			<input checked="" type="checkbox"/> CC1 (45-60 credits)	52-56

\*\*Enter name of base degree in 'AAS Title' box

LAST AMENDMENT APPROVED ON 01.21.22

### TYPE OF PROGRAM AMENDMENT

(Check ALL That Apply)

<input type="checkbox"/> New Program++	<b>Curriculum Revision</b>	<input checked="" type="checkbox"/> Revision in Program Credits
<input type="checkbox"/> Title Change for Program		<i>Proposed Total Credits:</i>
<i>Proposed AAS Title:</i>		
<i>Proposed OPTION Title:</i>		
<i>Proposed Certificate Title:</i>		
<input type="checkbox"/> <b>SUSPENSION</b> of Program	<i>Reason for Suspension:</i>	
<b>Suspension Effective Date:</b>		


++If new program is an additional award for an existing degree or certificate, complete 'Program Information' section for existing program.

## CURRICULUM AMENDMENT

[List in a Defined Sequence of Courses Format, e.g., Quarter-to-quarter mapping.  
For a New Program, complete the Proposed Curriculum section only.]

<i><b>CURRENT CURRICULUM 21-22</b></i>				<i><b>PROPOSED CURRICULUM 22-23</b></i>			
<small>[List entire curriculum as last approved]</small>				<small>[List only course(s) to be amended]</small>			
Course	Title	Hours	Credits	Course	Title	Hours	Credits
Fall Term							
HOR-113	Organic Farming Practicum/Fall	55	3				
HOR-124	Food Harvest	44	3				
HOR-223	Applied Plant Science	44	4				
<b>MTH-050 Or MTH-065 Or higher</b>	<b>Technical Mathematics I or Algebra II or higher level math</b>	<b>44-55</b>	<b>4-5</b>				
--	Organic Farming program electives		2				
Winter Term							
<b>BA-285 Or COMM-100</b>	<b>Human Relations in Business or Basic Speech Communication</b>	<b>33-44</b>	<b>3-4</b>				
HOR-136	Organic Farming Practicum/Winter	55	3				
HOR-216	Integrated Pest Management	33	3				
HOR-230	Equipment Operation & Maintenance	44	2				
Spring Term							
HOR-135	Propagation of Edible Plants	44	3				
HOR-140	Soils	33	3				
HOR-141	Organic Farming Practicum/Spring	88	4				
--	Organic Farming program electives		3-4				
Summer Term							
HOR-146	Fruit & Berry Growing	44	3				
HOR-284	Organic Farming Practicum/Summer	108	3				
HOR-285	Organic Farming/CWE	90	3				
<b>WR-101 Or WR-121</b>	<b>Communication Skills: Occupational Writing or English Composition</b>	<b>33-44</b>	<b>3-4</b>				
Organic Farming Program Electives							
BA-223	Principles of Marketing	44	4				
BA-230	Social Media Marketing	44	4				
HOR-235	Weed Identification	20	2				

HOR-236	Insect Identification	20	2				
HOR-237	Disease Identification	20	2				
HOR-240	Irrigation Practices	44	3				
				HOR-246	Organic Farming and Gardening	44	2
<b>TOTAL CURRENT CREDITS:</b>			52-56	<b>TOTAL PROPOSED CREDITS:</b>			

<b>College Contact</b>		<b>Telephone No.</b>	
<b>E-Mail Address</b>		<b>Fax No.</b>	
<b>Chief Academic Officer or PTE Dean Signature</b>			<b>Date</b> 4/28/22

<b>Course Number</b>	<b>Title</b>	<b>Implementation</b>
BA-222	Financial Management	2022/SU

**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: November 5, 2021 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** Business & Computer Science: Business

Submitter

First Name: Joan  
Last Name: San-Claire  
Phone: 3013  
Email: joan.san-claire

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**Course Prefix and Number:** BA - 222

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**# Credits:** 3

Contact hours

Lecture (# of hours): 33  
Lec/lab (# of hours):  
Lab (# of hours):  
Total course hours: 33

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

---

**Course Title:** Financial Management

Course Description:

Study of sources and uses of funds, financials, and cash flows; includes valuation of financial assets; long-term cash flows and budgeting; cost of capital; capital structure and dividend policy; working-capital management, ethics, and international business finance.

---

**Type of Course:** Lower Division Collegiate

Is this class challengeable?

**No**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**No**

Are there prerequisites to this course?

**Yes**

**Pre-reqs: BA-211**

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

**A-F or Pass/No Pass**

**Audit: Yes**

When do you plan to offer this course?

**✓ Not every year**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**No**

Will this course appear in the schedule?

**No**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. apply financial decision making to financial markets, using interest rate analysis, cash flow analysis, and financial ratio analysis;
2. prepare financial forecasting and budgeting based on time value principles,
3. analyze value-added principles in debt and equity choices, factoring risk and return, cash flows, and cost of capital;
4. compute time value of money and capital budgeting applications;
5. explain the financing mix, determine dividend policy, describe working capital management, and liquid asset management; link each concept to decision making of a CFO.

---

***This course does not include assessable General Education outcomes.***

---

**Major Topic Outline:**

1. Foundations of finance.
2. Financial background.
3. Cash flows and financial analysis.
4. The financial system and interest.
5. Time value of money.
6. Valuation of bonds.
7. Valuation of stocks.
8. Risk and return.
9. Capital budgeting.
10. Cash flow estimation.
11. Risk and capital budgeting.
12. Cost of capital.
13. Capital structure and leverage.
14. Dividends.
15. Management of working capital.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

## **Section #2 Course Transferability**

Concern over students taking many courses that do not have a high transfer value has led to increasing attention to the transferability of LDC courses. The state currently requires us to certify that at least one OUS school will accept a



new LDC course in transfer. Faculty should communicate with colleagues at one or more OUS schools to ascertain how the course will transfer by answering these questions.

1. Is there an equivalent lower division course at the University?
2. Will a department accept the course for its major or minor requirements?
3. Will the course be accepted as part of the University's distribution requirements?

If a course transfers as an elective only, it may still be accepted or approved as an LDC course, depending on the nature of the course, though it will likely not be eligible for Gen Ed status.

Which OUS schools will the course transfer to? (Check all that apply)

- EOU (Eastern Oregon University)
- PSU (Portland State University)
- OIT (Oregon Institute of Technology)
- OSU (Oregon State University)
- UO (University of Oregon)

Identify comparable course(s) at OUS school(s)

How does it transfer? (Check all that apply)

general elective

:

First term to be offered:

**Specify term:** not active currently (replaced by BA240)

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**May 6, 2022**

Program	Implementation
Welding AAS	2022/SU
Entry Level Welding Technician CPCC	2022/SU



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<b>College:</b>	Clackamas Community College	<b>Date</b>	
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### CAREER LEARNING AREA

<input type="checkbox"/> Ag, Food & Natural Resource Systems	<input type="checkbox"/> Health Services
<input type="checkbox"/> Arts, Information & Communications	<input type="checkbox"/> Human Resources
<input type="checkbox"/> Business & Management	<input type="checkbox"/> Industrial & Engineering Systems

### PROGRAM INFORMATION

<u>APPROVED</u> Program Title	<u>APPROVED</u> CIP Code (Include 7 <sup>th</sup> & 8 <sup>th</sup> digits used for OCCURS reporting.)			<u>APPROVED</u> Recognition Award	Current Credits
(For Official Program Title, refer to your directory at <a href="http://www.ode.state.or.us/search/results/?id=232">http://www.ode.state.or.us/search/results/?id=232</a> )	6-digit CIP	7 <sup>th</sup> digit	8 <sup>th</sup> digit		
	<b>AAS Title:</b> <b>Welding Technology</b> AAS.WELDINGTECH	48.0508			<input checked="" type="checkbox"/> <b>AAS</b> (90-108 credits)
<b>Option Title**</b>				<input type="checkbox"/> <i>OPTION</i> to AAS Degree	
<b>Related Certificates:</b> <b>Entry Level Welder CP</b> <b>Welding Technology Certificate</b>				<input type="checkbox"/> Certificate of Completion	

\*\*Enter name of base degree in 'AAS Title' box

LAST AMENDMENT APPROVED ON 04/16/21

### TYPE OF PROGRAM AMENDMENT

(Check ALL That Apply)

<input type="checkbox"/> <b>New Program++</b>	<input type="checkbox"/> <b>Curriculum Revision</b>	<input type="checkbox"/> <b>Revision in Program Credits</b>
<input type="checkbox"/> <b>Title Change for Program</b>		<i>Proposed Total Credits:</i> <b>93-94</b>
<i>Proposed AAS Title:</i>		
<i>Proposed OPTION Title:</i>		
<i>Proposed Certificate Title:</i>		
<input type="checkbox"/> <b>SUSPENSION</b> of Program	<i>Reason for Suspension:</i>	
<b>Suspension Effective Date:</b>		

++If new program is an additional award for an existing degree or certificate, complete 'Program Information' section for existing program.

## CURRICULUM AMENDMENT

[List in a Defined Sequence of Courses Format, e.g., Quarter-to-quarter mapping.  
For a New Program, complete the Proposed Curriculum section only.]

### CURRENT CURRICULUM 21-22


[List entire curriculum as last approved]

### PROPOSED CURRICULUM 22-23

[List only course(s) to be amended]

Course	Title	Hours	Credits	Course	Title	Hours	Credits
Welding Technology Associate of Applied Science Degree: 1 <sup>st</sup> Year							
First Term							
<b>MFG-107</b>	<b>Industrial Safety &amp; First Aid</b>	<b>33</b>	<b>3</b>				
<b>MTH-050*</b>	<b>Technical Mathematics I</b>	<b>44</b>	<b>4</b>				
WLD-100	Welder's Print Reading I	33	3				
WLD-111 Or WLD-111A And WLD-111B	Shielded Metal Arc Welding (Stick)	176	8				
Second Term							
MFG-103	Machining for Fabrication & Maintenance	66	3				
MFG-109	Computer Literacy for Technicians	33	3				
WLD-113 Or WLD-113A And WLD-113B	Gas Metal Arc Welding/Flux Core Arc Welding (Wirefeed)	176	8				
<b>WR-101*</b>	<b>Communication Skills: Occupational Writing</b>	<b>33</b>	<b>3</b>				
Third Term							
WLD-110	Welder Certification	88	4				
WLD-115 Or WLD-115A And WLD-115B	Gas Tungsten Arc Welding (GTAW)	176	8				
--	<b>Human Relations requirement (see page 82)</b>		<b>3</b>				
Welding Technology Associate of Applied Science Degree: 2 <sup>nd</sup> Year							
Fourth Term							
MFG-221	Materials Science	66	3				
WLD-211	Advanced Shielded Metal Arc Welding	88	4				
WLD-250	Welding Fabrication I Beginning Project	88	4				
--*	General electives (any college level course)		3				

--	Welding Technology program elective		3	--	Welding Technology program elective		2-3
<b>Fifth Term</b>							
WLD-200	Welder's Print Reading II	33	3				
WLD-210	Pipe Welding	88	4				
WLD-213	Advanced Gas Metal Arc Welding/Flux Core Arc Welding	88	4				
WLD-251	Welding Fabrication II Intermediate Project	88	4				
<b>Sixth Term</b>							
WLD-215	Advanced Gas Tungsten Arc Welding	88	4				
WLD-252	Welding Fabrication III Advanced Project	88	4				
--	Welding Technology program elective		4				
<b>Catalog Notes</b>							
*Substitute college transfer courses for these courses if you plan to continue your education at a higher education institution. It is recommended that you consult with a faculty or academic advisor for the transfer requirements of the specific advanced program or school.							
<b>Welding Technology Program Electives</b>							
Any course with a MFG or WLD prefix not included in the Welding Technology Program or other technical course with approval.				REMOVE			
				IMT-108	Rigging and Lifting	44	2
				WLD-102	Introduction to Welding	44	2
				WLD-103	Blacksmithing & Traditional Iron Working	44	2
				WLD-104	Introduction to CNC Plasma Cutting	44	2
				WLD-110	Welder Certification	88	4
				WLD-150	Welding Processes	88	4
				WLD-203	Blacksmithing & Traditional Iron Working II	44	2
				WLD-261	Welding Special Projects	22-44	1-2
				WLD-270	Certified Welding Inspector (CWI) Study	44	4
<b>TOTAL CURRENT CREDITS:</b>			94	<b>TOTAL PROPOSED CREDITS:</b>			93-94

<b>College Contact</b>	AUWD	<b>Telephone No.</b>	3046
<b>E-Mail Address</b>		<b>Fax No.</b>	
<b>Chief Academic Officer or PTE Dean Signature</b>			<b>Date</b> 4/28/22



## COMMUNITY COLLEGE PROGRAM AMENDMENT FORM

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<b>College:</b>	Clackamas Community College	<b>Date</b>	
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### CAREER LEARNING AREA

<input type="checkbox"/> Ag, Food & Natural Resource Systems	<input type="checkbox"/> Health Services
<input type="checkbox"/> Arts, Information & Communications	<input type="checkbox"/> Human Resources
<input type="checkbox"/> Business & Management	<input type="checkbox"/> Industrial & Engineering Systems

### PROGRAM INFORMATION

<u>APPROVED</u> Program Title  <small>(For Official Program Title, refer to your directory at <a href="http://www.ode.state.or.us/search/results/?id=232">http://www.ode.state.or.us/search/results/?id=232</a>)</small>	<u>APPROVED</u> CIP Code <small>(Include 7<sup>th</sup> &amp; 8<sup>th</sup> digits used for OCCURS reporting.)</small>			<u>APPROVED</u> Recognition Award	Current Credits
	<u>6-digit CIP</u>	<u>7<sup>th</sup> digit</u>	<u>8<sup>th</sup> digit</u>		
<b>AAS Title:</b> Welding Technology AAS				<input type="checkbox"/> Associate of Applied Science (AAS) Degree	
<b>Option Title**</b>				<input type="checkbox"/> OPTION to AAS Degree	
<b>Certificate Title:</b> <i>Within</i> AAS Degree? <input checked="" type="checkbox"/> Yes** <input type="checkbox"/> No Entry Level Welding Technician CC.ENTRYWLDTECH	48.0508	JZ	*	<input checked="" type="checkbox"/> Career Pathway (12-44)	21-22

\*\*Enter name of base degree in 'AAS Title' box

### TYPE OF PROGRAM AMENDMENT

(Check ALL That Apply)


<input type="checkbox"/> <b>New Program++</b>	<input type="checkbox"/> <b>Curriculum Revision</b>	<input type="checkbox"/> <b>Revision in Program Credits</b>
<input type="checkbox"/> <b>Title Change for Program</b>		<i>Proposed Total Credits:</i> <b>23</b>
<i>Proposed AAS Title:</i>		
<i>Proposed OPTION Title:</i>		
<i>Proposed Certificate Title:</i>	<b>Entry Level Welder</b>	
<input type="checkbox"/> <b>SUSPENSION of Program</b>	<i>Reason for Suspension:</i>	
<b>Suspension Effective Date:</b>		

++If new program is an additional award for an existing degree or certificate, complete 'Program Information' section for existing program.

## CURRICULUM AMENDMENT

[List in a Defined Sequence of Courses Format, e.g., Quarter-to-quarter mapping.  
For a New Program, complete the Proposed Curriculum section only.]

<i><b>CURRENT CURRICULUM 21-22</b></i>				<i><b>PROPOSED CURRICULUM 22-23</b></i>			
[List entire curriculum as last approved]				[List only course(s) to be amended]			
Course	Title	Hours	Credits	Course	Title	Hours	Credits
<b>Term 1</b>							
MFG-107	Industrial Safety & First Aid	33	3	REMOVE			
WLD-100	Welder's Print Reading I	33	3				
WLD-250	Welding Fabrication I Beginning Project	88	4	Move to Term 2			
--	Entry Level Welding Technician program electives		11-12	REMOVE			
				WLD-111 Or WLD-113 Or WLD-115	Shielded Metal Arc Welding (Stick) Or Gas Metal Arc Welding/Flux Core Arc Welding (Wirefeed) Or Gas Tungsten Arc Welding (GTAW)	176	8
<b>Term 2</b>							
				WLD-111 Or WLD-113 Or WLD-115	Shielded Metal Arc Welding (Stick) Or Gas Metal Arc Welding/Flux Core Arc Welding (Wirefeed) Or Gas Tungsten Arc Welding (GTAW)	176	8
				WLD-250	Welding Fabrication I Beginning Project	88	4
<b>Entry Level Welding Technician Program Electives</b>							
MFG-103	Machining for Fabrication & Maintenance	66	3	REMOVE			
WLD-110	Welder Certification	88	1 or 4				
WLD-111	Shielded Metal Arc Welding (Stick)	176	4 or 8				
WLD-113	Gas Metal Arc Welding/Flux Core Arc Welding (Wirefeed)	176	4 or 8				
WLD-115	Gas Tungsten Arc Welding (GTAW)	176	4 or 8				
<b>Catalog Notes</b>							
				No course may be used to satisfy more than one requirement			
<b>TOTAL CURRENT CREDITS:</b>			21-22	<b>TOTAL PROPOSED CREDITS:</b>			23

<b>College Contact</b>	AUWD	<b>Telephone No.</b>	
<b>E-Mail Address</b>		<b>Fax No.</b>	
<b>Chief Academic Officer or PTE Dean Signature</b>			<b>Date</b> 4/28/22



<b>Course Number</b>	<b>Title</b>	<b>Implementation</b>
MFG-111	Machine Tool Fundamentals I	2022/SU
MFG-112	Machine Tool Fundamentals II	2022/SU
MFG-113	Machine Tool Fundamentals III	2022/SU
MFG-200	Introduction to CNC	2022/SU
MFG-201	CNC I: Set-up and Operation	2022/SU
MFG-202	CNC II: Programming & Operation	2022/SU
MFG-203	CNC III: Applied Programming & Operation	2022/SU
MFG-204	Computer-Aided Manufacturing I	2022/SU
MFG-205	Computer-Aided Manufacturing II	2022/SU
MFG-206	Computer-Aided Manufacturing III	2022/SU
MFG-210	CAM Special Projects	2022/SU
MFG-211	Machine Tool Fundamentals IV	2022/SU

**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: October 5, 2018 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Bob  
Last Name: Delgatto  
Phone: 3320  
Email: delgatto

---

**Course Prefix and Number:** MFG - 111

---

**# Credits:** 9

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 198  
Lab (# of hours):  
Total course hours: 198

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

---

**Course Title:** Machine Tool Fundamentals I

**Course Description:**

This course is an introduction to machine tool operation, precision measurement and engineering drawings. It also covers machine tool operations including drill presses, lathes and milling machines. The course includes internal and external threading. Variable Credit: 3-9 credits. May be repeated for up to 9 credits.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**Yes**

**Up to how many credits can this course be repeated to satisfy a degree requirement?** 9

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Technology AAS, Computer-Aided Manufacturing AAS

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** MFG-104, MFG-107, and MTH-050

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Summer**

✓ **Fall**

✓ **Winter**

✓ **Spring**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**Yes**

Course Number: APR-111MA Title: Machine Tool Fundamentals I

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

3 credits:

1. Identify personal protective safety equipment, and proper safe behavior, including machine specific safety procedures, necessary for safe conduct in the machine shop environment;
2. Calculate proper RPM, and feed rates for Lathes, milling machines, and drill presses for a variety of cutting tools;
3. Measure and document dimensions of machined parts through the proper use and handling of a variety of dimensional inspection instruments;
4. Describe the major components of a milling machine, describe advantages and disadvantages of different cutting tool materials, identify mill tool holders, and identify different cutting tools used on a milling machine;
5. Describe the major components of a lathe, describe advantages and disadvantages of different cutting tool materials, identify lathe tool holders, and identify different lathe tool geometries;
6. Name the different types of work holding devices that could be mounted on the spindle of a lathe.

6 credits:

1. Demonstrate the process for changing RPM and Feed Rate on a gear head lathe;
2. Describe the process for dialing in a 4 jaw chuck;
3. Explain the difference between Pitch and Lead of a thread, and apply mathematical formulas used in the single point cutting of a thread on a lathe;
4. Describe the purpose of, and when to engage the Half-Nut on a lathe;
5. Successfully set up, cut and inspect threads on a lathe;
6. Identify major types of Drilling Machines and the variety of drills, taps and support tooling used on them;
7. Demonstrate safe setup, operation, and proper work holding procedures on a drill press, mill and lathe;
8. Apply properly calculated speed and feed rates for a variety of cutting tools on mills and lathes;
9. Describe basic types of cutting fluid and when they should be used.

9 credits:

1. Describe a variety of saws used in industry and demonstrate safe setup and operating procedures when using the horizontal or vertical band saw;
2. Describe conditions that determine blade selection for a horizontal or vertical band saw;
3. Recognize different blade tooth configuration and geometry;
4. Name advantages and disadvantages of an abrasive saw and when it is best used;
5. Demonstrate the proper set up, implementation, and verification of tapping procedures;
6. Describe the proper cutting of external threads with a threading die;
7. Describe the safe and proper use of a pedestal grinder, and demonstrate through the sharpening of a High Speed Steel tool bits.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. 3 Credit:

- a. Shop safety
- b. Lathe, milling machine and drill press rpm calculations
- c. Milling cutter rpm and feed rate calculations
- d. Inch/millimeter conversions
- e. The correct applications, reading, handling and storage of steel rules
- f. How to read and measure parts with a Vernier, dial or digital caliper
- g. Application and reading outside, inside and depth micrometers
- h. Application of small hole gages, telescoping gages and parallel bars
- i. Manual lathe use and application
- j. Lathe controls and their function
- k. Commonly used tool holders for lathes
- l. Commonly used cutting tool for the lathe
- m. Use of 3 & 4-jaw chucks on the lathe
- n. Collets, face plates and drive plates for the lathe

2. 6 Credit:

- a. Operation of the various lathe controls
- b. Facing and center drilling on the lathe
- c. Sixty-degree thread calculations
- d. The setup and cutting of a sixty-degree external thread
- e. In process inspection or Inspection of a completed sixty-degree external thread
- f. The calculations for the cutting of a sixty-degree internal thread
- g. The setting up and cutting of a sixty-degree internal thread
- h. In process inspection or Inspection of a completed sixty-degree internal thread
- i. The various types of drilling machines used by industry
- j. The various types of drills used by industry
- k. The hand grinding of a twist drill
- l. The correct setup and operation of a drilling machine
- m. The corrects application, setup and use of Counterboring, countersinking and spotfacing tools

3. 9 Credit:

- a. The various types of saws used by industry
- b. Safe setup and operation of the horizontal and vertical band saws
- c. Applications and advantages and disadvantages of the abrasive saw
- d. How to prepare to setup and use the vertical band saw
- e. Using the vertical band saw
- f. Taps and tapping applications
- g. Correct tapping methods
- h. Reducing tap breakage and broken tap removal
- i. Types and application of thread cutting dies
- j. Shaft size prior the thread cutting with a die
- k. Applications of pedestal grinders in the machine shop
- l. Pedestal grinder safety

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

:

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**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: February 21, 2014 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Mark  
Last Name: Schmidt  
Phone: 3472  
Email: marks

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**Course Prefix and Number:** MFG - 112

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**# Credits:** 9

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 198  
Lab (# of hours):  
Total course hours: 198

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Machine Tool Fundamentals II

**Course Description:**

This course is a continuation of machine tool operations. Covers set-up and operation of the vertical milling machine and boring techniques on the lathe. Includes surface grinding and selection of abrasive grinding wheels. Variable Credit: 3-9 credits. May be repeated for up to 9 credits.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**Yes**

**Up to how many credits can this course be repeated to satisfy a degree requirement?** 9

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Programs

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** 6 credits of MFG-111

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: No**

When do you plan to offer this course?

✓ **Fall**

✓ **Winter**

## ✓ Spring

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**Yes**

Course Number: APR-112MA Title: Machine Tool Fundamentals II

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

3 credits:

1. identify the basic geometric dimensioning & tolerancing symbols relevant to machining projects,
2. describe how a positive or negative tool rake may affect the surface finish of a piece of material,
3. describe relationship between high speed steel, carbide and the surface finishes obtained at different surface feet per minute speeds;
4. describe the two basic functions of cutting fluids,
5. identify four different types of cutting fluids,
6. describe the basic advantages of carbide cutting tools over that of high speed steel,
7. identify some of the variables to consider when selecting a carbide cutting tool,
8. describe the advantages and disadvantages of turning a part between centers,
9. name the various types of centers used in a lathe tailstock,
10. state how much material should be left on a part for a finish cut,
11. describe the result when on the work piece when the lathes centers are out of alignment,
12. name three method of aligning the centers on a lathe,
13. explain the chief advantage of boring over reaming in a lathe,
14. list five ways to eliminate chatter in a boring bar,
15. describe the rpm that a ream should rotate at,
16. describe how fast a ream should be feed into a piece of material,
17. describe how to eliminate chatter when parting off a piece of material in a lathe,
18. explain how to eliminate the problem of double impressions when knurling,
19. explain how to avoid producing a knurl where the metal is flaking off.

6 credits:

1. describe when a steady rest should be used on a lathe,
2. describe when a follow rest should be used on a lathe,
3. explain how a steady rest can be dialed in with a dial indicator,
4. explain how a steady rest can be used on a piece of square or rectangular material,
5. name five different types of translating screw threads,
6. give the included angle of an acme thread,
7. calculate the correct depth of an external acme thread,
8. define the pitch of a thread,
9. define the lead of a thread,
10. describe what a multiple lead thread is,
11. name three advantages of a multiple lead thread,
12. name the types of threads that can be produced as a multiple lead,
13. identify and explain the function of each the major components of the vertical milling machine,
14. correctly identify a variety of milling cutters used on the vertical milling machine and the application of where it should be used,
15. describe how to correctly setup a part on the vertical milling machine and describe the related tooling such a vices, parallel bars, screw jacks, hold down clamps associated with the setup;
16. calculate the correct rpm and feed rate for a milling cutter,



17. explain the differences, advantages and disadvantages between conventional and climb milling, 9 credits:

1. name some of the commonly used materials used to produce grinding wheels,
2. identify some of most basic wheel symbols specification used to specify information about grinding wheels,
3. name some of the "variable" factors that need to be considered when selecting a grinding wheel,
4. describe what dressing a grinding wheel is and what it does for the grinding wheel,
5. describe what truing a grinding wheel is and what it does for the grinding wheel,
6. describe the position of the grinding wheel dresser with regards to the grinding wheel,
7. describe the advantages of a built-in wheel dresser,
8. describe what a form dresser is and where it would be used,
9. describe how a grinding wheel is balanced,
10. name two types of wheel balancers,
11. name four types of grinding fluids,
12. describe the correct application of a grinding fluid when surface grinding,
13. name at least three methods of filtering waste material from grinding fluids,
14. name the major components of a surface grinder and their function,
15. name the most commonly used work holding device on a surface grinder,
16. name two additional work holding devices used on the surface grinder,
17. explain what is meant by the term "grinding ratio,"
18. describe some of the most common problems associated with surface grinding,
19. explain how to eliminate some of the most common problems associated with surface grinding.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. 3 Credit:

- a. Basic geometric and dimensioning symbols.
- b. How metal flows when being cut.
- c. The different types of chips produced with a cutting tool.
- d. The effect the surface feet per minute has on the material's surface finish.
- e. The machinability index of various types of materials.
- f. Different types of cutting fluids used by industry.
- g. The appropriate application of each of the cutting fluids.
- h. Methods of applying cutting fluids.
- i. The various methods of filtering cutting fluids.
- j. The benefits of filtration and reuse of the cutting fluids.
- k. Applications for high speed steel and carbide.
- l. Variable factors to consider when selecting a carbide cutting tool.
- m. The ASA carbide tool and insert identification system.
- n. Appropriate applications for turning a part between centers.
- o. Setting up and machining a part between centers.
- p. The different types of centers used in the lathe tailstock.
- q. Mounting parts on tapered or expanding mandrels.
- r. Inspecting a lathe for center misalignment.
- s. Alignment of the lathe center.
- t. Other lathe operations such as drilling, boring, reaming, tapping, parting off and knurling.

2. 6 Credit:

- a. Basic geometric and dimensioning symbols.
- b. Applications for using the steady rest on a lathe.
- c. Applications for using a follow rest on a lathe.
- d. How to correctly setup a steady or follow rest on a lathe.
- e. How to center or dial in a steady rest on a lathe.
- f. How to setup and turn irregular shaped material in a steady rest.
- g. The different types of translating screw threads used by industry.
- h. Acme, square, modified square and buttress thread calculations.
- i. Understanding the function and application of multiple lead threads.
- j. Understanding how to setup and cut a multiple lead external thread.
- k. The major components of a knee type vertical milling machine and their function.
- l. The various types of milling cutters used on the vertical milling machine.
- m. The different types of cutter holders used on the vertical milling machine.

- n. How to (square) or dial the head of a vertical milling machine in perpendicular to its table.
- o. How to dial a part in so it is parallel or perpendicular to the axis of the table.
- p. How to correctly use and edge finder.
- q. How to dial in the center of a bore on a part.
- r. How to correctly calculating the feed and speed of milling cutters.
- s. How to mill out a cavity on a part on the vertical milling machine.
- t. The various methods of milling an angle on a part.
- u. Applications for using a rotary table or indexing head.

3. 9 Credit:

- a. The various types of grinding machines used in industry.
- b. The different types of commonly used grinding wheel materials.
- c. Review of common grinding wheel specifications.
- d. Some of the variable factors to consider when selecting a grinding wheel.
- e. The difference between dressing and truing a grinding wheel.
- f. When to true and dress a grinding wheel.
- g. How to true and dress a grinding wheel.
- h. What is form dressing of a grinding wheel, and how it is performed.
- i. When does a grinding wheel need to be balanced, and how is it performed.
- j. Advantages and disadvantages of the two different types of wheel balancers.
- k. The different types of grinding fluids used by industry.
- l. The correct application of grinding fluids on grinding wheels.
- m. The various methods and benefits of grinding fluid filtration.
- n. The major components of the horizontal reciprocating grinder and their function.
- o. The most widely used work holding devices for the surface grinder.
- p. The difference between electro-permanent magnetic chuck and the permanent magnetic chuck.
- q. How to reinstall a magnetic chuck if it has been removed from the surface grinder.
- r. What are laminated accessories, and how are they used in work holding on surface grinders.
- s. Setups and operations on the surface grinder.
- t. The general cause of surface grinding problems.
- u. Specific problems and solutions in surface grinding.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

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**Clackamas Community College**  
Online Course/Outline Submission System

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Date approved: June 1, 2011 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Mike  
Last Name: Mattson  
Phone: 3322  
Email: mattsonm

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**Course Prefix and Number:** MFG - 113

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**# Credits:** 9

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 198  
Lab (# of hours):  
Total course hours: 198

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Machine Tool Fundamentals III

**Course Description:**

Topics include offset boring heads, rotary tables, indexing devices, and taper attachments. Also covers applied technical math, inspection techniques, optical comparators, coordinate measuring machines, and cylindrical grinding. Variable Credit: 3-9 credits. May be repeated for up to 9 credits.

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**Type of Course:** Career Technical Preparatory

**Reason for the new course:**

Coming forward for review, not a new course.

**Is this class challengeable?**

**Yes**

**Can this course be repeated for credit in a degree?**

**Yes**

**Up to how many credits can this course be repeated to satisfy a degree requirement? 9**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s): Manufacturing Programs**

Are there prerequisites to this course?

**Yes**

**Pre-reqs: 6 credits of MFG-112**

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations: MFG-111 and MFG-112**

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

**A-F or Pass/No Pass**

## **Audit: Yes**

When do you plan to offer this course?

- ✓ **Fall**
- ✓ **Winter**
- ✓ **Spring**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. 3 credits,
  - a. describe basic reasons for tolerance specifications,
  - b. recognize common geometric dimensioning and tolerances,
  - c. describe the reasons for press fits and know where to find press fit allowance information,
  - d. identify common angular measuring tools,
  - e. read various angular measuring instruments,
  - f. calculate sine bar elevations,
  - g. calculate sine bar elevations and establish angles using a sine bar and gage blocks,
  - h. describe the care required to maintain gage blocks and their accuracy,
  - i. wring gage blocks together correctly,
  - j. calculate combinations of gage block stacks with and without wear blocks,
  - k. describe gage block applications,
  - l. describe the applications for an offset boring head,
  - j. describe how an offset boring head is used on a vertical milling machine,
  - k. identify the most appropriate boring bar for a job,
  - l. describe an appropriate setup for an offset boring head,
  - m. describe the problems and solutions of obtaining a good surface finish in a bore with an offset boring head,
2. 6 credits:
  - a. recognize common geometric dimensioning and tolerances,
  - b. describe and identify a face milling cutter,
  - c. setup and use a face milling cutter on a vertical milling machine,
  - d. explain the advantages and disadvantages of positive and negative rake angles on a face milling cutter,
  - e. describe the various factors that result in a successful face milling operation,
  - f. identify the use for various tool materials such as high speed steel, carbide, ceramic and diamond cutting tools;
  - g. name a variety of cutting tool coatings,
  - h. calculate chip thickness in relation to feed per tooth,
  - i. identify end mill rigidity factors,
  - j. describe where and when indexing devices are used,
  - k. explain why does the indexing plate have a number of different hole circles,
  - l. describe the difference between direct and simple indexing,
  - m. perform a basic indexing calculation for given hole pattern,
  - n. describe an application for the use of a rotary table,
  - o. discuss the application of indexing items such as super-spacer, collet block chucks, collet indexers, and spin indexers;

3. 9 credits.

- a. recognize common geometric dimensioning and tolerances,
- b. identify the major parts of the cylindrical grinder,
- c. describe the various movements of the major parts of the cylindrical grinder,
- d. describe the general capabilities of the cylindrical grinder,
- e. explain the advantages in having the diamond wheel dresser integral with the footstock,
- f. describe the function and advantage of a parallel test bar on a cylindrical grinder,
- g. explain the function of the terry control on the cylindrical grinder,
- h. recognize the effects of common surface grinding and cylindrical grinding problems,
- i. describe six methods of cutting a taper on a lathe,
- j. state the difference between a steep taper and a slight taper,
- k. explain three ways that tapers are expressed,
- l. name four method of measuring a taper,
- m. inspect a taper to determine its size,
- n. name four types of keys used in industry,
- o. look up key and keyway information in the Machinery's Handbook.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

- 1. GDT symbols.
- 2. Tolerances, fits, and SPC.
- 3. Offset boring heads.
- 4. Face milling.
- 5. CNC tooling.
- 6. Direct and simple indexing.
- 7. Indexing and angular machining.
- 8. Bolt hole circle calculations.
- 9. Taper attachments.
- 10. Cylindrical grinders.
- 11. Types of keys and keyway calculations.
- 12. Broaching.
- 13. CMM set-up and operation.

**Does the content of this class relate to job skills in any of the following areas:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

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**Clackamas Community College**  
Online Course/Outline Submission System

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Date approved: June 1, 2011 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Mike  
Last Name: Mattson  
Phone: 3322  
Email: mattsonm

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**Course Prefix and Number:** MFG - 200

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**# Credits:** 1

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 22  
Lab (# of hours):  
Total course hours: 22

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Introduction to CNC

**Course Description:**

Short course to prepare students to be entry-level CNC machine operators. Covers fundamentals of operation, setup principles and G & M code programming. Students will use hands-on activities on industrial milling & turning centers. Recommended for individuals with limited knowledge of CNC machining.

---

**Type of Course:** Career Technical Preparatory

**Reason for the new course:**

Coming forward for review, not a new course.

**Is this class challengeable?**

**Yes**

**Can this course be repeated for credit in a degree?**

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Programs

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** MFG-111

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?



✓ **Not every term**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. operate a CNC vertical milling center to produce accurate products in a safe and productive manner,
2. load NC part programs into a CNC control and verify their correct operation,
3. understand the fundamentals of machine setup including the installation of work holding devices and cutting tools,
4. be familiar with the Cartesian coordinate system used by all CNC machinery,
5. identify the most common G&M control codes,
6. safely make minor edits of NC part programs.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Machining safety.
2. Machine operation.
3. Cutting tool setup and adjustment.
4. Installation of work holding tooling.
5. Program transfer.
6. Program editing.
7. The cartesian coordinate system.
8. Common G&M codes.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

:



**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: January 18, 2019 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

Submitter

First Name: Mike  
Last Name: Mattson  
Phone: 3322  
Email: mattsonm

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**Course Prefix and Number:** MFG - 201

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**# Credits:** 4

Contact hours

Lecture (# of hours):  
Lec/lab (# of hours): 88  
Lab (# of hours):  
Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** CNC I: Set-up and Operation

Course Description:

A hands-on class will teach students how to set-up and operate Computer Numerical Control (CNC) milling and turning centers. Includes an introduction to G&M-code programming. Designed for persons with little or no previous experience.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**No**

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** 6 credits of MFG-111

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** MFG-109 and MTH-080

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Fall**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**Yes**

Course Number: APR-201MA Title: CNC I: Set-up and Operation

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. appreciate how CNC machine tools have benefited industry by increasing productivity and reducing product cost,
2. understand the control system of a CNC machine,
3. use trigonometry to solve programming problems,
4. identify and use standardized G and M control codes specific to FANUC control systems,
5. transfer programs to and from a CNC machine tool using communication software,
6. install work-holding hardware and set-up machine work-zeros,
7. install tooling into a CNC machine,
8. touch off tools and set-up tool height offsets,
9. perform 1st runs on the CNC programs for the purpose of proving them out
10. work safely around automated manufacturing equipment.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. History, wages and controls.
2. Cartesian coordinate system.
3. Parameters, reference & home.
4. Machine & workpiece coordinates.
5. Tool length & radius compensation.
6. CNC tooling basics.
7. Machine set-up and operation.
8. G & M-codes.
9. Canned cycles.
10. Projects.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

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**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red           

Date approved: October 20, 2017 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Wes  
Last Name: Locke  
Phone: 3321  
Email: wesl

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**Course Prefix and Number:** MFG - 202

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**# Credits:** 4

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 88  
Lab (# of hours):  
Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** CNC II: Programming & Operation

**Course Description:**

This course emphasizes the writing of G&M machine codes. Students will learn advanced programming and operations of CNC milling centers and basic programming, set-up, and operation of CNC turning centers.

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**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Technology AAS, Computer-Aided Manufacturing AAS

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** MFG-201

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Summer**

✓ **Winter**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**Yes**

Course Number: APR-202MA Title: CNC II: Programming and Operatio

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. describe how efficiencies are gained through the use of CNC technology to provide increased productivity and reduced product cost,
2. use trigonometry to solve programming problems,
3. identify and use control codes specific to FANUC and OKUMA control systems,
4. write G&M code programs from scratch,
5. interpret a Numerical Control (NC) program and determine what machining operations are taking place,
6. transfer programs to and from a CNC machine tool using communication software,
7. install work-holding hardware and set-up machine work-zeros,
8. install tooling into CNC milling and turning machines,
9. touch off tools and set-up tool offsets on CNC milling and turning machines,
10. perform first runs on the CNC programs for the purpose of prove out.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. CNC mill
  - a. Sub-programming
  - b. 4TH axis programming
  - c. Set-up
  - d. Operation
2. CNC lathe
  - a. Programming
  - b. Set-up
  - c. Operation

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |



Percent of course: 0%

First term to be offered:

**Next available term after approval**

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**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: March 17, 2017 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Wes  
Last Name: Locke  
Phone: 3321  
Email: wesl

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**Course Prefix and Number:** MFG - 203

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**# Credits:** 3

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 66  
Lab (# of hours):  
Total course hours: 66

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** CNC III: Applied Programming & Operation

**Course Description:**

Students work individually or in small groups to design, program, manufacture, and test advanced projects using: CNC mills, CNC lathes, Electrical Discharge Machines (EDM) and various software applications.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Technology AAS, Computer-Aided Manufacturing AAS

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** MFG-202

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** MFG-201 or MFG-204

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Fall**

✓ **Spring**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. explain the basics of the Electrical Discharge Machines (EDM) process,
2. write a simple CNC EDM program,
3. state the specific advantages of an EDM sinking machine,
4. set-up and produce parts on the EDM machine,
5. set the machining process parameters including the power and flushing setting to obtain the desired workpiece characteristics and economy,
6. describe manufacturing processes that rely on EDM,
7. work in a team environment to produce project parts.

---

***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Introduction to Electrical Discharge Machines (EDMs).
2. EDM safety.
3. EDM machine operation.
4. EDM fundamentals.
5. EDM programming.
6. Electrode materials and design.
7. Related manufacturing processes.
8. Technical report writing application (included with labs and projects).

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

:

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**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red           

Date approved: January 18, 2019 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Bob  
Last Name: Delgatto  
Phone: 3320  
Email: delgatto

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**Course Prefix and Number:** MFG - 204

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**# Credits:** 4

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 88  
Lab (# of hours):  
Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Computer-Aided Manufacturing I

**Course Description:**

This course is an introduction to computer-aided part creation and programming. Students will use CAD/CAM software to generate Numerical Control (NC) code to produce machined products. Model creation, process verification, code generation and CAD/CAM integration will be covered.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Technology AAS and Computer Aided Manufacturing AAS

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** 6 credits of MFG-111

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Fall**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. demonstrate an understanding of basic CAD practices,
2. create wire frame geometry,
3. import geometry into the CAM system,
4. identify toolpath operation types,
5. create CAM generated tool paths,
6. utilize the "Verify" and "Backplot" utility to trouble shoot toolpaths, within the CAM program;
7. post process the toolpath to NC code,
8. apply this to previously acquired CNC skills to produce a machined part.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Basic CAD drawing.
2. Geometry modifications and transformations.
3. Basic Toolpath creation.
4. Cutter Compensation through CAM.
5. Data entry shortcuts.
6. Toolpath Verification.
7. Toolpath Backplot.
8. Importing CAD files.
9. Use of the Operations Manager.
10. Utilizing Job Set-up.
11. Post processing.
12. File transmission.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

:



**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: February 21, 2014 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Mike  
Last Name: Mattson  
Phone: 3322  
Email: mattsonm

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**Course Prefix and Number:** MFG - 205

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**# Credits:** 4

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 88  
Lab (# of hours):  
Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Computer-Aided Manufacturing II

**Course Description:**

This course focuses on hands-on CNC and manufacturing activities, including Mastercam solids, lathe, and multi-axis. Additional topics will include reverse engineering and post-processing. Class time will be devoted to demonstrations, and in-class projects.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Programs

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** MFG-204

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Winter**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. have a technological literacy of the emerging manufacturing technologies including Computer Aided Machining (CAM), Computer Aided Engineering (CAE), and Computer Integrated Manufacturing (CIM);
2. use Mastercam Lathe software to create a simple cylindrical turning model,
3. understand the process of reverse engineering,
4. create simple solid models in a Parasolids-based modeler,
5. identify and select the appropriate technology and level of automation.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. CAM Technologies Review.
  - a. CAD/CAM Software.
  - b. CNC & Motion Control.
  - c. CIM.
2. Industrial Controls.
  - a. Electrical and Electronic Concepts.
  - b. Test Equipment; DMM, Oscilloscope.
  - c. Sensors, Actuators and Relays.
  - d. Relay Ladder Logic.
  - e. Programmable Logic Controllers.
3. Robotics and Motion Control.
  - a. Mechanical and electrical systems.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red           

Date approved: March 6, 2015 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Chris  
Last Name: Rizzo  
Phone: 3327  
Email: chrisr

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**Course Prefix and Number:** MFG - 206

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**# Credits:** 3

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 66  
Lab (# of hours):  
Total course hours: 66

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Computer-Aided Manufacturing III

**Course Description:**

This course exposes students to advanced cad/cam processes, including mill/turn, four and five axis machining, tombstone and work holding concepts.

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**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**No**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing Programs

Are there prerequisites to this course?

**Yes**

**Pre-reqs:** MFG-205

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

## ✓ Spring

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. set-up and operate multi-axis milling process,
2. set-up and operate a lathe with live tooling,
3. demonstrate the capabilities and limitations of multi-axis machining,
4. demonstrate varied work holding and tooling systems used in industry.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Introduction to multi-axis.
2. Types of multi-axis machines.
3. Work zeros, offsets, and axis combinations.
4. Programming techniques and processes.
5. Introduction to mill/turn.
6. Types of mill/turning machines.
7. Programming techniques and processes.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Specify term:** Spring 2015

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**Clackamas Community College**  
Online Course/Outline Submission System

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Show changes since last approval in red

Date approved: March 17, 2017 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Wes  
Last Name: Locke  
Phone: 3321  
Email: wesl

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**Course Prefix and Number:** MFG - 210

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**# Credits:** 4

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 88  
Lab (# of hours):  
Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** CAM Special Projects

**Course Description:**

Allows students to integrate and improve CNC and CAD/CAM manufacturing skills. Students will be assigned a variety of hands-on projects based on their skill level and interest. Variable Credit: 1-4 credits. May be repeated for up to 4 credits. Required: Student Petition.

---

**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**No**

Can this course be repeated for credit in a degree?

**Yes**

**Up to how many credits can this course be repeated to satisfy a degree requirement?** 4

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**No**

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** MFG-201 and MFG-204 (May be taken concurrently with MFG-204)

**Requirements:** Student Petition.

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?



## ✓ Not every term

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**No**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. demonstrate the ability to document, plan and implement a manufacturing process for a given product;
2. demonstrate a proficiency with CAD/CAM software and CNC machining,
3. accurately manufacture a part or parts based on a process plan,
4. work independently on an individual project.

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***This course does not include assessable General Education outcomes.***

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Major Topic Outline:

1. Create or obtain engineering drawings (CAD/CAM).
2. Develop shop drawing (CAD/CAM).
3. Develop a manufacturing process plan.
4. Create CNC programs and set-up sheets as necessary.
5. Manufacture parts using prints, process plan, set-up sheets, etc.
6. Dimensionally inspect/document finished parts.

Does the content of this class relate to job skills in any of the following areas:

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

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**Clackamas Community College**  
Online Course/Outline Submission System

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Date approved: June 1, 2011 Certified General Education Area(s): None

**Section #1 General Course Information**

**Department:** IDTD

**Submitter**

First Name: Mike  
Last Name: Mattson  
Phone: 3322  
Email: mattsonm

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**Course Prefix and Number:** MFG - 211

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**# Credits:** 6

**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 132  
Lab (# of hours):  
Total course hours: 132

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Machine Tool Fundamentals IV

**Course Description:**

Concentrates on CNC setup and operation and on surface grinding. Students will develop and apply their machining skills while creating products in a team environment. Additional topics may include fixture design and cutting mechanics. Variable Credit: 3-6 credits. May be repeated for up to 6 credits.

---

**Type of Course:** Career Technical Preparatory

**Reason for the new course:**

Coming forward for review, not a new course.

**Is this class challengeable?**

**Yes**

**Can this course be repeated for credit in a degree?**

**Yes**

**Up to how many credits can this course be repeated to satisfy a degree requirement? 6**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s): Manufacturing Programs**

Are there prerequisites to this course?

**Yes**

**Pre-reqs: 6 credits of MFG-113**

**Have you consulted with the appropriate chair if the pre-req is in another program?**

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations: MFG-104, MFG-105 and MFG-113**

**Requirements:**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

## Audit: Yes

When do you plan to offer this course?

- ✓ Fall
- ✓ Winter
- ✓ Spring

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. 3 credit,
  - a. recognize common geometric dimensioning and Tolerances,
  - b. calculate and select the correct gage blocks to obtain a specific gage block stack height,
  - c. setup a sine bar to a specific angle by calculating, selecting and wringing the selected gage blocks together;
  - d. set an angle on Vernier protractor and measure an angle with a Vernier protractor,
  - e. explain the SAE-AISI numerical designation system of alloy steels,
  - f. name a variety of methods used to determine the alloy content of steels,
  - g. explain the benefits of nonferrous metals,
  - h. describe some of the applications of nonferrous metals,
  - i. explain what hardening, case hardening and tempering is as it relates to steel;
  - j. explain the difference between through hardening and case hardening,
  - k. explain what annealing; normalizing and stress relieving are as they relate to steels;
  - l. describe what Rockwell and Brinell hardness testing are and the difference between the two,
  - m. perform a Rockwell hardness test on a piece of material and convert the hardness reading to a Brinell hardness number,
2. 6 credit,
  - a. recognize common geometric dimensioning and Tolerances,
  - b. name at least three different types of materials used as cutting tools,
  - c. name the advantages of cutting tool coatings such as titanium nitride,
  - d. describe the advantages and applications of high-speed steel and carbide cutting tools,
  - e. describe the various types of machining processes such as trepanning, spade drilling, roller burnishing;
  - f. describe the process and application for advanced machining processes such as electrical discharge machining, electron beam machining, ultrasonic machining, hydrojet machining, and laser machining;
  - g. describe the purpose of tool design with regards to jigs and fixtures,
  - h. describe the difference between a jig and a fixture and their applications,
  - i. identify the types of locators and supports used for jigs and fixtures,
  - j. describe what fool proofing of a jig or fixture is and how it is done,
  - k. describe some of the different types of pin locators and bushings used on jigs and fixtures,
  - l. explain some of the basic principles of work-holders on jigs and fixtures,
  - m. describe the advantages and disadvantages of mechanical versus that of automated work-holding devices on jigs and fixtures,
  - n. describe the basic construction principles of jigs and fixtures,
  - o. describe the proper placement and clearance for drill bushing,
  - p. identify various types of drill bushings.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. 3 credit.

- a. Geometric dimensioning and Tolerancing symbols as related to projects.
- b. Gage block stack calculations and selection.
- c. Right triangle calculations.
- d. Establishing a specific angle through the use of gage blocks and a sine bar.
- e. Measuring and reading angles with the aid of a Vernier protractor.
- f. Inspecting a part with a Vernier protractor and height gage.
- g. Reading and interpretation of a SAE-AISI alloy steel chart.
- h. Commonly used methods of identification of alloy steels.
- i. Machinability ratings of various alloy steels.
- j. Variable factors for the selection and application of nonferrous metals in industry.
- k. Other types of commonly used nonferrous metals used by industry.
- l. The differences between hardening of steels, case hardening and tempering.
- m. Commonly used quenching media for steels.
- n. Commonly used methods for case hardening of low carbon steels.
- o. Common problems associated with heat treatment of steels.
- p. The benefits of annealing, normalizing and the stress relieving of steels.
- q. The benefits of determining the Rockwell hardness of a piece of steel.
- r. How does Rockwell hardness testing differ from Brinell hardness testing?
- s. How to convert a Rockwell hardness test number to a Brinell hardness number.

6 credit.

- a. Geometric dimensioning and Tolerancing symbols as related to projects.
- b. The various types of cutting tool such as HSS, carbide, ceramics, PCBN, PCD and diamond.
- c. The types of coatings being applied to cutting tools and their benefits.
- d. The various methods of hole making such as indexable drills, spade drills and trepanning.
- e. The benefits of roller burnishing and over that of boring or reaming.
- f. Calculating the appropriate RPM for a ball end mill verses the depth of cut.
- g. Advanced machining processes such EDM, wire-cut EDM, electron beam machining, electrolytic grinding, ultrasonic machining, plasma beam and laser machining.
- h. The purpose of jig and fixture tool design.
- i. The various types and functions of jigs and fixtures used by industry.
- j. How does a jig differ from a fixture.
- k. Some of the more commonly used jigs and fixtures.
- l. The basic principles for the design and location of jig and fixture locators.
- m. What is foolproofing and how do you design it into a jig or fixture?
- n. The necessity for repeatability with jig and fixture locators.
- o. The importance of clamping and work-holding principles.
- p. The various types of strap, screw, swing and hook clamps.
- q. The advantages of quick-acting clamps such as cam-action clamps, wedge clamps and toggle-clamps.
- r. The advantages and disadvantages of power clamping over that of hand clamping.
- s. The various types of magnetic chucks and clamping accessories.
- t. The basic construction principles of jig and fixture design.
- u. The various types of bushings used with jigs and fixtures.
- v. Cap screws, set screws, thread inserts, and dowels and jig pins.

**Does the content of this class relate to job skills in any of the following areas:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

First term to be offered:

**Next available term after approval**

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## Curriculum Committee Membership 22-23

vacant

### Curriculum Committee/Curriculum Office

Member	Committee Role	Ending Term	Term Cycle
Kerrie Hughes	Chair	2024/SP	2-year
	Alternate Chair	2024/SP	2-year
David Plotkin	Vice President, Instruction & Student Services	Ex-Officio	Permanent
Jason Kovac	Dean, Institutional Effectiveness & Planning	Ex-Officio	Permanent
Lisa Reynolds	Associate Dean, Institutional Effectiveness & Planning	Ex-Officio	Permanent
Dru Urbassik	Director, Curriculum & Scheduling	Ex-Officio	Permanent
Megan Feagles	Curriculum & Scheduling Office/Recorder	Ex-Officio	Permanent
Elizabeth Carney	Center for Teaching and Learning Representative	Ex-Officio	Permanent
Rotates	ASG Student Representative	Ex-Officio	Permanent
	Library	2021/SP	3-year

### Academic Foundations and Connections (AFAC)

Member	Committee Role	Ending Term	Term Cycle
Tara Sprehe	Dean, AFAC	Ex-Officio	Permanent
Terrie Sanne	Financial Aid	Ex-Officio	Permanent
Sarah Steidl	Graduation Services	Ex-Officio	3-year
Dustin Bare	Director, Student Academic Support Services	2023/SP	3-year
Kara Leonard	Academic and Career Coaches	2023/SP	3-year
Andrea Vergun	Basic Skills Development & ESL	2025/SP	3-year
Amanda Coffey	English	2024/SP	3-year
<b>Tracy Nelson</b>	Health/Physical Education; <b>Review Team Lead</b>	2025/SP	3-year
Scot Pruyn	Math	2022/SP	3-year
Casey Sims*	Faculty-At-Large	2023/SP	3-year

### Arts & Sciences

Member	Committee Role	Ending Term	Term Cycle
Sue Goff	Dean, Arts & Sciences	Ex-Officio	Permanent
<b>Bev Forney</b>	<b>Associate Dean, Arts &amp; Sciences; Review Team Lead</b>	Ex-Officio	Permanent
Nora Brodnicki	Art, Comm, Theatre, Journalism, World Lang, Music	2023/SP	3-year
George Burgess	Faculty-At-Large	2023/SP	3-year
Rick Carino	Computer Science	2023/SP	3-year
Patricia McFarland	Faculty-At-Large	2024/SP	3-Year
Jim Wentworth-Plato	Horticulture	2023/SP	3-year
Eden Francis	Sciences and Engineering	2022/SP	3-year
Kerrie Hughes	Faculty-At-Large	2024/SP	3-year
Charles Siegfried	Associate Faculty	2022/SP	3-year
	Faculty-At-Large		3-year

### Technology, Applied Science, and Public Services (TAPS)

Member	Committee Role	Ending Term	Term Cycle
Cynthia Risan	Dean, TAPS	Ex-Officio	Permanent
<b>Shalee Hodgson</b>	<b>Associate Dean, TAPS; Review Team Lead</b>	Ex-Officio	Permanent
Jeff Ennenga	Wilsonville, Apprenticeship, Fire, Emergency	2023/SP	3-year
Sharron Furno**	Education, Human Services, Criminal Justice/Public Services	2023/SP	3-year
Dawn Hendricks	Faculty-At-Large	2024/SP	3-year
Mike Mattson	Industrial Technology	2024/SP	3-year
Helen Wand	Nursing, Allied Health/Associate Faculty	2024/SP	3-year
	Automotive/Welding	2021/SP	3-year

## Sub-Committees

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### Related Instruction Sub-Committee

Member	Ending Term
Shalee Hodgson (Lead)	Ex-Officio
Sarah Steidl	Ex-Officio
Kerrie Hughes	2024/SP
Tracy Nelson	2025/SP

### General Education Sub-Committee

Member	Ending Term
Lisa Reynolds (Lead)	Ex-Officio
Elizabeth Carney	Ex-Officio
Nora Brodnicki	2023/SP
Sharron Furno**	2023/SP
Kerrie Hughes	2024/SP
Patricia McFarland	2024/SP

### 2021-2022 Sabbaticals

\*Casey Sims replaced by Lupe Martinez while on sabbatical in 22/WI and 22/SP

### 2022-2023 Sabbaticals

\*\*Sharron Furno



# ISP 161

## Course Creation, Edits, Inactivation, and Reactivation

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### PURPOSE

Establishes standards for creating, editing, inactivating and reactivating courses.

### SUMMARY

Each department is responsible for submitting outlines for new courses as well as updating currently approved outlines, and inactivating or reactivating courses as needed. Curriculum Committee and the Office of Community Colleges and Workforce Development (CCWD) approval are required for all credit bearing courses, except for experimental courses (xxx-199 and xxx-299) which are offered for a limited time only.

### STANDARD

- A) Departments will assess the need and impact of proposed new courses and course edits prior to Department Chair and Division Dean approval. Edits include changes, inactivation, and reactivation of courses.
- B) The Division Dean will provide approval to the Curriculum Office when new courses are entered into the [Curriculum Management System](#).
- C) New courses and edited courses will meet all required CCWD and/or accreditation requirements.
- D) Departments will submit new courses and edit existing courses through the [Curriculum Management System](#).
- E) New course numbers will be determined between the course submitter and the Curriculum Office.
- F) The Curriculum Office will be responsible for entering new and updating existing course information into the Student Information System and with CCWD.
- G) Departments will provide notification of course inactivation or reactivation to the Curriculum Office.
- H) The Curriculum Committee will approve the general education and/or related instruction designation of courses. This will be based on whether the course meets the CCWD and/or accreditation criteria for effective general education and/or related instruction courses. As part of the process, the general education and related instruction course certifications will indicate how the course's student learning outcomes align with the corresponding certification general education student learning outcomes.
- H\I) The Curriculum Office will make available a process document outlining the steps for a new course approval, course edits, course inactivation, and course reactivation.

### REVIEW HISTORY

ISP Committee	Adopted	May 14, 2021
College Council	Reviewed	May 7, 2021
College Council	Reviewed	May 16, 2014
College Council	Reviewed	April 17, 2009
College Council	Reviewed	February 19, 2004
Instructional Council	Adopted	January 23, 1996

# ISP 181

## Related Instruction

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### PURPOSE

Defines Related Instruction requirements for all 1-year Certificates of Completion, all non-transfer degrees such as the Associate of Applied Science degree, and the Associate of General Studies degree.

### SUMMARY

All 1-year Certificates of Completion and all AAS (Associate of Applied Science and AGS (Associate of General Studies) degrees require at least 1 course in each of computation, communication and human relations categories. In addition, all AAS and AGS degrees require physical education/health/safety/first aid.

### STANDARD

1. The Curriculum Committee will review new and revised 1-year Certificates of Completion, Associate of Applied Science and Associate of General Studies degrees to ensure that they meet all Related Instruction requirements.
2. The Curriculum Committee will approve proposed courses that meet the requirements for Computation, Communication, Human Relations and Physical Education/Health/Safety/First Aid, as necessary to meet program needs identified by departments and advisory committees.  
The criteria can be found on the [Related Instruction Checklist](#).
3. The catalog will list all the courses that meet related instruction requirements for each of the four categories described in #2 above.
4. The Career Technical Programs section of the catalog will specifically call out the course(s) that satisfy the Related Instruction requirement for each 1-year Certificate of Completion and Associate of Applied Science degree.

### REVIEW HISTORY

ISP Committee	Reviewed	March 8, 2019
College Council	Reviewed	March 1, 2019
ISP Committee	Reviewed	February 8, 2019
ISP Committee	Updated Format	August 3, 2016
College Council	Reviewed	March 7, 2014
College Council	Reviewed	February 15, 2013
College Council	Reviewed	April 7, 2006
Instructional Council	Adopted	May 21, 1991