DURHAM COLLEGE
SUCCESS MATTERS

Faculty of Sci, Eng, & IT

Manufacturing Sciences

2023-24 Academic Year

Program Title	Ministry Title	Major	Year	Semester
SEIT-Mechanical Engineering Technician	--	METC	1	1
SEIT-Mechanical Engineering Technology	--	METY	1	1
SEIT-Electromechanical Engineering Technology	--	EMTY	1	2

Course Code:	MANF 1131	**Course Equiv. Code(s):**	N/A
Course Hours:	56	**Course GPA Weighting:**	4
Prerequisite:	N/A		
Corequisite:	N/A		
Laptop Course:	**Yes** [ ] **No** [X]		
Delivery Mode(s):	**In class** [X] **Online** [X] **Hybrid** [ ] **Flexible** [ ] **HyFlex** [ ]		
Remote proctoring required	**Yes** [ ] **No** [X]		
Authorized by (Dean or Director):	Tony Doyle	**Date:**	September 2023

Prepared by		
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Course Description:

This course is designed to give the Student a fundamental, entry-level introduction to some of the many varied processes utilized in a conventional machine/fabrication shop. Student will also apply some of this theoretical information while performing safe, effective operation of hand and machine tools by practical demonstration within a "shop" environment. Safety will be an integral, on-going topic.

Campus Closure Notice

In the event of a campus closure during which time classes cannot be conducted or attended in person, course delivery will be conducted remotely where possible. Should teaching and learning resume on campus, students may be organized into smaller groups for classroom delivery, in accordance with directions from public health authorities. In either situation, the learning plan sequence and/or evaluation methods may be adjusted to address topics requiring hands-on, practical learning activities.

Subject Eligibility for Prior Learning Assessment & Recognition (PLAR):

Prior Learning Assessment and Recognition (PLAR) is a process a student can use to gain college credit(s) for learning and skills acquired through previous life and work experiences. Candidates who successfully meet the course learning outcomes of a specific course may be granted credit based on the successful assessment of their prior learning. The type of assessment method (s) used will be determined by subject matter experts. Grades received for the PLAR challenge will be included in the calculation of a student's grade point average.

The PLAR application process is outlined in http://www.durhamcollege.ca/plar. Full-time and part-time students must adhere to all deadline dates. Please email: PLAR@durhamcollege.ca for details.

PLAR Eligibility

Yes [ ] **No** [X]

PLAR Assessment (if eligible):

- [ ] Assignment
- [ ] Exam
- [ ] Portfolio
- [ ] Other

Course Learning Outcomes

Course Learning Outcomes contribute to the achievement of Program Learning Outcomes for courses that lead to a credential (e.g. diploma). A complete list of Vocational/Program Learning Outcomes and Essential Employability Skill Outcomes are located in each Program Guide.

Course Specific Learning Outcomes (CLO)

Student receiving a credit for this course will have reliably demonstrated their ability to:

CLO1	Apply safe work procedures within the machine shop area.
CLO2	Interpret relevant documentation necessary for the fabrication of components.
CLO3	Describe and demonstrate the process of measuring fabricated components using rules, calipers, micrometers, & comparators.
CLO4	Describe and demonstrate the process of setting up and operating a vertical milling machine.
CLO5	Describe and demonstrate the process of laying out components for machining and forming.
CLO6	Describe and demonstrate the process of setting up and operating a lathe.
CLO7	Describe and demonstrate the process of setting up and operating a surface grinder.

Essential Employability Skill Outcomes (ESSO)

This course will contribute to the achievement of the following Essential Employability Skills:

- [ ] EES 1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- [X] EES 2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- [X] EES 3. Execute mathematical operations accurately.
- [X] EES 4. Apply a systematic approach to solve problems.
- [X] EES 5. Use a variety of thinking skills to anticipate and solve problems.
- [ ] EES 6. Locate, select, organize, and document information using appropriate technology and information systems.
- [ ] EES 7. Analyze, evaluate, and apply relevant information from a variety of sources.
- [ ] EES 8. Show respect for the diverse opinions, values, belief systems, and contribution of others.
- [X] EES 9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
- [X] EES 10. Manage the use of time and other resources to complete projects.
- [X] EES 11. Take responsibility for one's own actions, decisions, and consequences.

Evaluation Criteria:

The Course Learning Outcomes and Essential Employability Skills Outcomes are evaluated by the following evaluation criterion.

Evaluation Description	Course Learning Outcomes	EESOs	Weighting
Quiz: Quizzes - 12 at 1%	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6, CLO7	EES2, EES3, EES4, EES5, EES9, EES10, EES11	12
Lab Activity: Practice Part 1	CLO1, CLO2, CLO3, CLO4	EES2, EES5, EES10, EES11	5
Lab Activity: Practice Part 2	CLO1, CLO2, CLO3, CLO6	EES2, EES5, EES10, EES11	5
Project: Practical Project	CLO1, CLO2, CLO3, CLO4, CLO5	EES2, EES3, EES4, EES5, EES9, EES10, EES11	25
Project: Practical Project	CLO1, CLO2, CLO3, CLO5, CLO6, CLO7	EES2, EES3, EES4, EES5, EES9, EES10, EES11	25
Exam: Week 7 Mid-Term Assessment	CLO1, CLO2, CLO3, CLO4, CLO5	EES2, EES3, EES4, EES5, EES9, EES10, EES11	14
Exam: Week 14 Final-Term Assessment	CLO1, CLO2, CLO3, CLO5, CLO6, CLO7	EES2, EES3, EES4, EES5, EES9, EES10, EES11	14
Total			**100%**

Notes:

1. To successfully pass this course, the student is required to achieve a minimum average mark of 50% or higher for Week 7 Mid-Term and Project Assessment and a minimum average mark of 50% or higher for Week 14 Final-Term and Project Assessment. Inability to do so will result in a failing grade!

Required Text(s) and Supplies:

1. Machining Fundamentals handbook 11th edition by John R. Walker & Bob Dixon (publisher: Goodheart-Willcox)
2. CSA approved safety glasses (available in the bookstore). For students that wear prescription glasses: protective side shields.
3. CSA approved safety shoes.

Recommended Resources (purchase is optional):

1. 6" steel rule with fractional inch graduations to 1/64" and metric graduations to .5mm.
2. Dial or digital caliper with a measuring range of at least 6" with .001" graduations (dial) or 3 decimal places (digital).
3. Outside micrometer with a measuring range from zero to 1" with .001" graduations.
4. A lab coat (Bookstore) or shop coat of any kind to protect your clothes from being stained and soiled.

Policies and Expectations for the Learning Environment:

General Policies and Expectations:

General College policies related to	**General policies related to**
+ Acceptable Use of Information Technology + Academic Policies + Academic Integrity + Standards for Student Conduct for all Learning Environments can be found at https://durhamcollege.ca/wp-content/uploads/Standards-of-Student-Conduct-for-all-Learning-Environments.pdf + Information about academic policies and procedures can be found on-line at https://durhamcollege.ca/about/governance/policies	+ attendance + absence related to tests or assignment due dates + excused absences + writing tests and assignments + classroom management can be found in the Program Guide (full time programs only) in MyDC https://durhamcollege.ca/mydc/

All students at Durham College have the responsibility to familiarize themselves with and abide by the college's Academic Integrity Policy. Students are expected to complete and submit their own work in an honest manner, in accordance with the policy. Durham College has zero tolerance for breaches of academic integrity. All suspected breaches of academic integrity will be investigated and documented following procedures outlined in the policy, and should a breach be confirmed, appropriate penalties will be levied. Breaches of academic integrity refer to a variety of practices including, but not limited to:

• copying another person's work;
• using unauthorized materials or resources during an evaluation;
• obtaining unauthorized copies of evaluations in advance;
• collaborating without permission;
• colluding or providing unauthorized assistance;
• falsifying academic documents or records;
• misrepresenting academic credentials;
• buying, selling, stealing, soliciting, exchanging or transacting materials or information for the purpose of academic gain;
• bribing or attempting to bribe personnel;
• impersonation;
• submitting the same work in more than one course without authorization;
• improper use of computer technology and the internet;
• depriving others of academic resources;
• misrepresenting reasons for special consideration of academic work;
• plagiarizing or failing to acknowledge ideas, data, graphics or other content without proper and full acknowledgement;
• any unauthorized use of generative or other artificial intelligence.

If you have questions or concerns about what constitutes appropriate academic conduct or research and citation methods, and what your responsibilities are towards academic integrity, please visit the Academic Integrity website on MyDC, reach out to Student Academic Learning Services (SALS), or speak with your professor or Student Advisor.

Course Specific Policies and Expectations:

COURSE DELIVERY:

Students assigned to the milling module of the course will participate in Weeks: 1~7
At the end of week 7, you will then participate in Weeks: 8~14 the turning/grinding module.

Students assigned to the turning/grinding module of the course will participate in Weeks 1~7
At the end of week 7, you will then participate in Weeks: 8~14 the milling module.

CLASS TIMES:

Theory classes will start ten minutes past the hour, ending on the hour.

Practical classes will start ten minutes past the hour, ending ten minutes before the last hour. This last ten minutes will be used for cleaning of equipment, returning tools, etc.

No additional Practical shop time will be available outside regularly scheduled classes without approval.

BEHAVIOUR:

Students are expected to conduct themselves in a manner that respects the right of their peers and the teacher to learn and work in an environment that is safe and free from distraction.

The use of cell phones during either Theory or Practical classes is not permitted.

The wearing of CSA approved safety glasses (wearers of prescription glasses: side shields) is a legal requirement not optional while working in the machine shop area.

No student may vacate the practical class before the scheduled end time without first notifying their teacher. The teacher is accountable for the student's safety and their whereabouts in the shop area.

At the discretion of the teacher, students not meeting the above standards may be asked to leave the classroom or shop area.

This requirement supports EES 11, that a student will "Take responsibility for one's own actions, decisions, and consequences."

ATTENDANCE

This subject is primarily practical in nature and conducted in a lab. Regular attendance is critical for success and the student is expected to attend all classes. When absent, the student will miss important lectures, quizzes, and teacher contact time. If the student is absent from class, it is their responsibility to catch up on missed work prior to the next class.

As there is no opportunity to make up time lost in the shop portion of the class, it is vital that students attend ALL scheduled lab classes.

This requirement supports EES 10, that students will "Manage the use of time and other resources to complete projects."

PRACTICAL PROJECT

The college and relevant teachers are not responsible for a student's project assembly and any associated components. It is the responsibility of the student to maintain the whereabouts of their project assembly and any associated components. No mark will be awarded for a missing project assembly and any associated components.

This requirement supports EES 11, that a student will "Take responsibility for one's own actions, decisions, and consequences."

General Course Outline Notes:

1. Students should use the course outline as a learning tool to guide their achievement of the learning outcomes for this course. Specific questions should be directed to their individual professor.
2. The college considers the electronic communication methods (i.e. DC Mail or DC Connect) as the primary channel of communication. Students should check the sources regularly for current course information.
3. Professors are responsible for following this outline and facilitating the learning as detailed in this outline.
4. Course outlines should be retained for future needs (i.e. university credits, transfer of credits etc.)
5. A full description of the Academic Appeals Process can be found at https://durhamcollege.ca/about/governance/policies/academic-policies .
6. Faculty are committed to ensuring accessible learning for all students. Students who would like assistance with academic access and accommodations in accordance with the Ontario Human Rights Code should register with the Access and Support Centre (ASC). ASC is located in room SW116, Oshawa Campus and in room 180 at the Whitby Campus. Contact ASC at 905-721-3123 for more information.
7. Durham College is committed to the fundamental values of preserving academic integrity. Durham College and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments could be subject to submission either by themselves or by the faculty member for a review of textual similarity to Turnitin.com. Further information about Turnitin can be found on the Turnitin.com Web site.

Learning Plan

The Learning Plan is a planning guideline. Actual delivery of content may vary with circumstances.

Students will be notified in writing of changes that involve the addition or deletion of learning outcomes or evaluations, prior to changes being implemented, as specified in the Course Outline Policy and Procedure at Durham College.

Week/ Module	**Hours:** 1 **Delivery:** In Class
1	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics Introduction. Safety. Measurement.
	Intended Learning Activities Lecture: Chapter 3 Chapter 5
	Resources and References Machining Fundamentals handbook.
	Evaluation

Week/ Module	Hours: 3 Delivery: Shop
1	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5
	Essential Employability Skills
	Taught: **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Project expectations. Safety. Measurement.
	Intended Learning Activities Practical: Introduction - project description and shop tour.
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
2	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics The milling machine & milling operations.
	Intended Learning Activities Lecture: Chapter 18 Chapter 19
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 1

Week/ Module	Hours: 3	Delivery: Shop	
2	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5		
	Essential Employability Skills		
	Taught:	**Practiced:**	EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The milling machine & milling operations.		
	Intended Learning Activities Practical: Milling practice component.		
	Resources and References Machining Fundamentals handbook.		
	Evaluation Lab Activity: Practice Part 1		**Weighting** 5
Week/ Module	**Hours:** 1	**Delivery:** In Class	
3	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5		
	Essential Employability Skills		
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:**	
	Intended Learning Objectives/Topics The milling machine & milling operations.		
	Intended Learning Activities Lecture: Chapter 18		
	Resources and References Machining Fundamentals handbook.		
	Evaluation Quiz: Quizzes - 12 at 1%		**Weighting** 1

Week/ Module	Hours: 3	Delivery: Shop
3	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills	
	Taught:	**Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The milling machine & milling operations.	
	Intended Learning Activities Practical: Milling practice component.	
	Resources and References Machining Fundamentals handbook.	
	Evaluation	

Week/ Module	Hours: 1	Delivery: In Class
4	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills	
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:**
	Intended Learning Objectives/Topics The milling machine, milling, & layout operations.	
	Intended Learning Activities Lecture: Chapter 6	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Quiz: Quizzes - 12 at 1%	**Weighting** 1

Week/ Module	Hours: 3 Delivery: Shop	
4	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills	
	Taught:	**Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The milling machine, milling, & layout operations.	
	Intended Learning Activities Lecture: Chapter 6 Practical: Milling to length and milling angles.	
	Resources and References Machining Fundamentals handbook.	
	Evaluation	

Week/ Module	Hours: 1 Delivery: In Class	
5	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills	
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:**
	Intended Learning Objectives/Topics The milling machine, milling, & drilling operations.	
	Intended Learning Activities Lecture: Chapter 12: pages 169~177	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Quiz: Quizzes - 12 at 1%	**Weighting** 1

Week/ Module	Hours: 3	Delivery: Shop	
5	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5		
	Essential Employability Skills		
	Taught:	**Practiced:**	EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The milling machine, milling, & drilling operations.		
	Intended Learning Activities Practical: Drilling & tapping of holes.		
	Resources and References Machining Fundamentals handbook.		
	Evaluation		
Week/ Module	**Hours:** 1	**Delivery:** In Class	
6	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5		
	Essential Employability Skills		
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:**	
	Intended Learning Objectives/Topics The milling machine & milling operations.		
	Intended Learning Activities Lecture: Chapter 18		
	Resources and References Machining Fundamentals handbook.		
	Evaluation Quiz: Quizzes - 12 at 1%		**Weighting** 1

Week/ Module	Hours: 3 Delivery: Shop	
6	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills	
	Taught:	**Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The milling machine & milling operations.	
	Intended Learning Activities Practical: Milling slot, & radii.	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Project: Practical Project	**Weighting** 25
Week/ Module	**Hours:** 1 **Delivery:** In Class	
7	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills	
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:**
	Intended Learning Objectives/Topics Student evaluation.	
	Intended Learning Activities Evaluation	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Exam: Week 7 Mid-Term Assessment	**Weighting** 14

Week/ Module	Hours: 3 Delivery: Shop
7	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO4, CLO5
	Essential Employability Skills
	Taught: **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Completion of the two jaws.
	Intended Learning Activities Practical: Submission of project for inspection and evaluation (3 hrs).
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
8	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics Introduction. Safety. Measurement.
	Intended Learning Activities Lecture: Chapter 3 Chapter 5
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 1

Week/ Module	Hours: 3 Delivery: Shop
8	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Project expectations. Safety.
	Intended Learning Activities Practical: Shop tour.
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
9	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics The lathe & turning operations including facing & turning.
	Intended Learning Activities Lecture: Chapter 14
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 1

Week/ Module	Hours: 3 Delivery: Shop	
9	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7	
	Essential Employability Skills	
	Taught:	**Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The lathe & turning operations including facing & turning.	
	Intended Learning Activities Practical: Turning practice component.	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Lab Activity: Practice Part 2	**Weighting** 5
Week/ Module	**Hours:** 1 **Delivery:** In Class	
10	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7	
	Essential Employability Skills	
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:**
	Intended Learning Objectives/Topics The lathe & turning operations including facing & turning.	
	Intended Learning Activities Lecture: Chapter 14 Chapter 14 .	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Quiz: Quizzes - 12 at 1%	**Weighting** 1

Week/ Module	Hours: 3 Delivery: Shop
10	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The lathe & turning operations including facing & turning.
	Intended Learning Activities Practical: Turning screw diameters. .
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
11	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics The lathe & turning operations including threading.
	Intended Learning Activities Lecture: Chapter 16 Chapter 16
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 1

Week/ Module	Hours: 3 Delivery: Shop
11	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The lathe & turning operations including threading.
	Intended Learning Activities Practical: Threading screws.
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
12	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics The lathe & turning operations including knurling & grooving.
	Intended Learning Activities Lecture: Chapter 14 Chapter 15
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 1

Week/ Module	Hours: 3 Delivery: Shop
12	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics The lathe & turning operations including knurling & grooving.
	Intended Learning Activities Practical: Knurling & grooving screws.
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
13	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Layout, component fabrication, & grinding operations.
	Intended Learning Activities Lecture: Chapter 20
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 1

Week/ Module	Hours: 3 Delivery: Shop
13	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: **Practiced:**
	Intended Learning Objectives/Topics Layout, component fabrication, & grinding operations.
	Intended Learning Activities Practical: Fabrication of clip(optional) & grinding practice component.
	Resources and References Machining Fundamentals handbook.
	Evaluation
Week/ Module	**Hours:** 1 **Delivery:** In Class
14	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7
	Essential Employability Skills
	Taught: EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:**
	Intended Learning Objectives/Topics Student evaluation.
	Intended Learning Activities Evaluation
	Resources and References Machining Fundamentals handbook.
	Evaluation **Weighting** Quiz: Quizzes - 12 at 1% 15 Exam: Week 14 Final-Term Assessment

Week/ Module	**Hours:** 3 **Delivery:** Shop	
14	**Course Learning Outcomes** CLO1, CLO2, CLO3, CLO5, CLO6, CLO7	
	Essential Employability Skills	
	Taught:	**Practiced:** EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Completion of clip and two screws.	
	Intended Learning Activities Submission of project for inspection and evaluation (3 hrs).	
	Resources and References Machining Fundamentals handbook.	
	Evaluation Project: Practical Project	**Weighting** 25

This course supports the following program(s) and program learning outcomes.

MECC: Mechanical Engineering Technology (Coop)	#2. Plan, co-ordinate, implement and evaluate quality control and quality assurance procedures to meet organizational standards and requirements.
	#3. Monitor and encourage compliance with current health and safety legislation, as well as organizational practices and procedures.
	#7. Prepare, analyze, evaluate and modify mechanical engineering drawings and other related technical documents.
	#9. Design, manufacture and maintain mechanical components according to required specifications.
METC: Mechanical Engineering Technician	#2. Apply quality control and quality assurance procedures to meet organizational standards and requirements.
	#3. Comply with current health and safety legislation, as well as organizational practices and procedures.
	#7. Interpret, prepare and modify mechanical engineering drawings and other related technical documents.
	#9. Manufacture, assemble, maintain and repair mechanical components according to required specifications.
METY: Mechanical Engineering Technology	#2. Plan, co-ordinate, implement and evaluate quality control and quality assurance procedures to meet organizational standards and requirements.
	#7. Prepare, analyze, evaluate and modify mechanical engineering drawings and other related technical documents.