Mechanical Engineering
New Jersey Institute of Technology

ME215 Engineering Materials and Processes
Course Syllabus and Guidelines Spring 2017

(Updated: January 24, 2017)

Class Times

Section	Lecture	Lab
002	Tue. 10:00-12:10 MEC221	Wed. 12:15-2:25 MEC232
004	Tue. 12:15-2:25 MEC221	Thu. 12:15-2:25 MEC232
006 & HM2	Thu. 10:00-12:10 MEC221	Fri. 1:45-3:55 MEC232
008	Mon. 10:00-12:10 MEC224	Wed. 10:00-12:10 MEC232
102	Tue. 5:45-7:40 MEC221	Tue. 7:50-9:45 MEC232
104	Fri. 5:45-7:40 MEC221	Fri. 7:50-9:45 MEC232

Instructors

Section(s)	Instructor	Office	Email
002 & 008	Prof. Koeneke Conrad	MEC324	cjk24@njit.edu
004	Prof. Veljko Samardzic	MEC325	samardzi@njit.edu
006 & HM2	Prof. Shawn Chester	MEC305	shawn.a.chester@njit.edu
102 & 104	Prof. Mohammad Behi	MEC324	mohammad.behi@njit.edu

Teaching Assistants

1. Nikola Bosnjak (nsb35@njit.edu)
2. Yusuf Dag (ynd3@njit.edu)
3. Jatin Kashyap (jk435@njit.edu)
4. Bharathbabu Nunna (bn63@njit.edu)

Office Hours

Instructors will also inform their section(s) of their office hours in the class. Also, office hours for individual instructors are posted in the department office.

Prerequisites

CHEM 126 or CHEM 122.

Text

(Required text) J.T. Black, R.A. Kohser. DeGarmo's Materials and Processes in Manufacturing, 11th Ed., John Wiley & Sons lnc., 2012.

(Lab manual) ME 215A: R. Dubrovsky: Engineering Materials and Processes. (May be found on the department webpage, or moodle in some cases)

Repeat Students

Students repeating the course are required to repeat the entire course. Assignments, laboratory practices and laboratory reports cannot be transferred from previous semesters.

Grading

Note that *late assignments, reports, etc., will not be accepted after the final exam begins.* The following weights will be used in determination of the final course grade:

Exam 1:	20%
Exam 2:	20%
Final Exam:	25%
Laboratory:	30%
HW/Quizzes/etc.:	5%

Further, in semesters where multiple sections of the course are running, for fairness and consistency, the final grades will be determined among all sections at once. That implies that any curve will be computed among all sections, not just a single section.

Exams

For all day sections Exam 1 and 2 will be common exams that take place on Monday 4:15-5:45pm, *Exam 1 will be on 2/20, and Exam 2 will be on 4/3*, and the room assignments will be announced in class. For evening sections exams will be held in the regular time and room following the syllabus weekly schedule. The final exam will also be a common exam, the time and place announced by the registrars office. For conflicts, we follow the NJIT policy for final exams provided online. The policy generally indicates that the course with the higher numerical value takes place during the regularly scheduled period.

The NJIT honor code will be upheld and any violations will be brought to the attention of the dean of students. Also, failure to show for an exam results in a grade of zero, unless the dean of students contacts me otherwise. *Mobile phones and similar electronic devices are expected to remain silent and not in use — the sight of a mobile phone during an exam results in a grade of F for the class.* Only non-programmable calculators are allowed during exams.

Communication

This course will make use of Moodle and/or the department webpage for dissemination of various materials. Also, you will be regularly contacted via email at your NJIT email address.

Problem Sets

Homework is regularly assigned. Assignments will be regularly collected, and a random sample of assignments will be graded at various times throughout the semester. The solutions will be posted online and no late assignments will be collected after the solutions are posted.

Laboratory and Laboratory Reports

Safety in the laboratory is a high priority – students are required to wear safety glasses at all times in the laboratory an experiment is being performed.

Laboratory attendance is mandatory, students are required to complete all laboratory practices and submit all corresponding laboratory reports to pass the course. Further, if more than 15 minutes late, credit will not be given for that laboratory practice and a makeup must be taken. *Pre-lab quizzes are given in the first 15 minutes, these simple quizzes serve to take attendance, as well as ensure that students have read the manual prior to the lab.* Students that miss a laboratory practice are required to makeup that experiment by going to another section that semester (*see the details below*). For a makeup, both instructors must have prior knowledge and the provided makeup form must be attached to the submitted lab report so proper attendance my be kept. After the second exam, we will not address makeup labs on an individual basis, there is simply not enough time left in the semester. For those that have makeup labs to take after the second exam, predesignated times (typically in the last two weeks of the semester) will be assigned for specific labs, one in the day and one in the evening.

Laboratory reports are due one week after the experiment is finished. (The report for the last laboratory practice is due 10 days after completion of the experiment and submitted in the lecture.) Each working day a laboratory report is late 10% is taken off the maximum allowable grade. Therefore a perfect lab report will get 50% credit if it is submitted 5 days late. After 10 days the report will have zero value, however will show on the record as being submitted.

Learning Outcome Expectation

Students are expected to gain a basic working knowledge of engineering materials and manufacturing processes, through combined lecture and laboratory exercises.

Requirements and Expectations

In order to ensure fairness and consistency among all sections of ME215, the following requirements and expectations are meant to ensure that all sections are equivalent, and everyone is treated equally and fair.

Requirements for Instructors Instructors will make their class list available to all TA's and other instructors at the start of the semester so grade sheets may be constructed. Instructors will comply to the schedule posted on the syllabus for lecture, as well as the lab schedule (with the exception of cancelled days). Exam question booklets will be held for one year, while answer sheets are returned to the student immediately. It is the instructors responsibility to take and maintain attendance for all laboratory periods. Instructors are expected to remain in the laboratory for the entire laboratory period, *the instructor is the responsible person* for the people and equipment. The course coordinator will arrange for two laptops for use with all lab class periods with media services. All instructors (and TA's) should meet at the start of the semester to coordinate.

Requirements for TA's Fill in the date received on lab reports when you receive them, and sign it. Have lab reports graded and returned one week after receipt of student submission. Adhere to the prescribed grading schedule for late reports as indicated here previously. Keep the grade sheet up to date and do not ever return lab reports without updating the grade sheet. Reports with incomplete cover pages should not be accepted for submission. Obtain the laptops from media services before the lab period starts, and return them when the lab period is finished (before 9pm for night classes). The most senior TA and the course coordinator will determine the specific lab schedule every semester. For new TA's, they should attend to prior classes for practical experience. All TA's should meet with the instructors at the start of the semester to coordinate.

Requirements for students Prior to the start of the lab class period, print a hard copy of the lab manual, read it, and bring it to the lab class period. Ensure that you have taken the pre-lab quiz for attendance. The student is responsible to attend all labs, and complete all reports since they are mandatory. Lab reports for submission should be printed prior to arrival to the lab class period. As soon as possible after missing a lab, it is the responsibility of the student to contact the instructor to arrange for a makeup lab, and also to bring a hardcopy of the makeup form for signatures, so that proper credit can be received. It is the responsibility of the student to inform the dean of students of any missed exam or other mandatory materials. Reports placed under doorways and not submitted during the class period are not the responsibility of TA's or instructors if lost. If you feel you are not going to pass this course, please reach out to your instructor with adequate time before the drop date.

Tentative Lecture Schedule

Section schedules are color coded as follows: 002 004 006 & HM2 008 102 104. Note that the schedule may be changed due to unforeseen circumstances such as weather closings.

Monday	Tuesday	Wednesday	Thursday	Friday
1/16/17	1/17/17 Lect. 1 Lect. 1 Lect. 1	1/18/17	1/19/17 Lect. 1	1/20/17 Lect. 1
1/23/17 Lect. 1	1/24/17 Lect. 2 Lect. 2 Lect. 2	1/25/17	1/26/17 Lect. 2	1/27/17 Lect. 2
1/30/17 Lect. 2	1/31/17 Lect. 3 Lect. 3 Lect. 3	2/1/17	2/2/17 Lect. 3	2/3/17 Lect. 3
2/6/17 Lect. 3	2/7/17 Lect. 4 Lect. 4 Lect. 4	2/8/17	2/9/17 Lect. 4	2/10/17 Lect. 4
2/13/17 Lect. 4	2/14/17 Lect. 5 Lect. 5 Lect. 5	2/15/17	2/16/17 Lect. 5	2/17/17 Lect. 5
2/20/17 Common Exam 1	2/21/17 Exam 1	2/22/17	2/23/17	2/24/17 Exam 1
2/27/17 Lect. 5	2/28/17 Lect. 6 Lect. 6 Lect. 6	3/1/17	3/2/17 Lect. 6	3/3/17 Lect. 6
3/6/17 Lect. 6	3/7/17 Lect. 7 Lect. 7 Lect. 7	3/8/17	3/9/17 Lect. 7	3/10/17 Lect. 7
3/13/17 Spring Break	3/14/17 Spring Break	3/15/17 Spring Break	3/16/17 Spring Break	3/17/17 Spring Break
3/20/17 Lect. 7	3/21/17 Lect. 8 Lect. 8 Lect. 8	3/22/17	3/23/17 Lect. 8	3/24/17 Lect. 8
3/27/17 Lect. 8 Drop day	3/28/17 Lect. 9 Lect. 9 Lect. 9	3/29/17	3/30/17 Lect. 9	3/31/17 Lect. 9
4/3/17 Common Exam 2	4/4/17 Exam 2	4/5/17	4/6/17	4/7/17 Exam 2
4/10/17 Lect. 9	4/11/17 Lect. 10 Lect. 10 Lect. 10	4/12/17	4/13/17 Lect. 10	4/14/17 Good Friday
4/17/17 Lect. 10	4/18/17 Lect. 11 Lect. 11 Lect. 11	4/19/17	4/20/17 Lect. 11	4/21/17 Lect. 10
4/24/17 Lect. 11	4/25/17 Lect. 12 Lect. 12 Lect. 12	4/26/17	4/27/17 Lect. 12	4/28/17 Lect. 11
5/1/17 Lect. 12	5/2/17 Lect. 12	5/3/17	5/4/17	5/5/17

Lecture Topics and Assignments

Lecture	Topic	Pages	Review Questions
1	Introduction. Manufacturing Systems Design	1-58	Ch.1: 1, 3, 6, 17, 27, 32; Ch.2: 12, 13
2	Nature of Metals and Alloys	89-104	Ch.4: 1, 2, 6, 14, 15, 19, 20, 21, 29, 32
3	Properties of Materials. Fundamentals of Metal Alloys, Equilibrium Diagrams.	59-88	Ch.3: 2, 5, 8, 9, 12, 13, 15, 17, 28, 29. Ch.5: 2, 4, 9, 10-16,
4	Iron-Iron Carbide Equilibrium Diagram, Steels and Cast Irons.	71-88, 114-119	Ch.5: 20, 25-27, 29-33, 35
5	Heat Treatment of Metals	121-148	Ch.6: 1, 5-7, 9, 10, 21, 23, 28, 50
-	Exam 1 on all material covered in lectures 1 through 3.	-	-
6	Ferrous Metals and Alloys, Cast Irons and Steels, Non-ferrous Alloys. Nonmetallic Materials. Materials selection for designed product.	152-180, 182-204, 208-244, 248-262	Ch.7: 2, 11, 17, 19, 22, 41, 48; Ch.8: 4, 5, 7; Ch.9: 2, 4, 38; Ch.10: 4
7	The Fundamentals of Metal Forming, Bulk Forming Processes, Hot and cold Working Processes, Sheet Forming Processes	379-395, 398-435, 440-477	Ch.15: 3, 22, 34, 43; Ch.16: 5, 40, Ch.17: 1, 19, 32;41
8	Casting, Powder Metallurgy and Joining Process. Processes and Their Influence on the Design Aspects of Machine Components	267-287, 291-320, 323-342, 481-503, 845-858, 860-887, 890-908, 910-936	Ch.11: 2, 8, 10; Ch.12: 1, 40; Ch.13: 1, 3, 4, 28; Ch.18: 1, 2, 4, 10, 16; Ch.30: 3, 7; Ch.31: 1, 8, 10; Ch.32: 7; Ch.33: 5, 13, 15, 28, 34
9	Measurement and Inspection. Process Capability and Quality Control.	958-993, 1215-1226	Ch.35: 1, 9-11, 21, 23; Ch.43: 5, 9, 10-Web based chapter
-	Exam 2 on all material covered in lectures 4 through 8.	-	-
10	Metal Cutting, Chip-type Machining Processes, and Tool Geometry.	533-564, 569-602	Ch.20: 3, 4, 6, 15, 20; Ch.21: 1, 6, 8, 13, 17
11	Machining Processes	609-634, 637-661	Ch.22: 2, 4, 8, 21; Ch.23: 8, 21, 23;
12	Machining Processes	665-684, 686-712, 1120-1140	Ch.24: 1, 12; Ch.25: 34; Ch.40: 1, 23
-	Final exam on material from all lectures as well as lab.	-	-