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| **Course:** | Weld 255G - Introduction to Metallurgy | | |
| **Instructor:** |  | | |
| **Course Date:** | 1/20/2017-3/10/2017 | | |
| **Room:** | Hartzell Hall: 151 | | |
| **Class Days:** | Fridays | | |
| **Class Time:** | **8:30am-12:30pm** | | |
| **Office Hours:** | **12:30pm-1:30pm** | **Office:** | Hartzell 153H |
| **Phone:** | **610-332-XXXX** | **E-mail:** | **XXXXX@northampton.edu** |
| **Northampton Community College Website:** | | Northampton.edu | |
| **MyNCC Website:** | | myncc.northampton.edu/ics | |
| **Blackboard:** | | Your course on Blackboard | |
| **Textbook**: | Metallurgy Fundamentals, 5th edition, by Daniel A. Brandt and J.C. Warner,  The Goodheart-Willcox Company, Inc., Tinley Park, Illinois. ISBN 978-1-60525-079-3. | | |
| **Student Handbook/Lab Manual:** | Student Handbook | | |
| **Prerequisite:** | WELD 205, MATH 103, ENGL 151, PHYS 152 | | |
| **Course Description:** | | | |
| This course covers the study of the physical, chemical and mechanical properties of ferrous and non-ferrous metals. Specific topics include mechanical testing, welding metallurgy, heat treatment, and nondestructive examination. The laboratory component of the course covers standard methods for determining the properties of common materials. This course also introduces the standards for interpreting, analyzing, and documenting research and experimental data within engineering and technical communities. | | | |

**Funding Notice**.

**This course receives special grant funding from the US Department of Labor. Students enrolled in this course are considered participants of the funding project, known as TAACCCT. As part of the funding, students will receive support from a career coach and employment specialist. The funding’s source requires data collection about students enrolled in the courses and may include name, Social Security number and employment needs. We appreciate your cooperation as we provide the required information to the grantee.**

**Table of Contents Page**

1.0 Student Learning Outcomes from the Course Outline 3

2.0 Ncc Policies 3

2.1 Class Attendance and Withdrawal 3

2.2 Academic Honesty Policy 4

2.3 Academic Honesty Violations 4

2.4 Penalties 5

2.5 Policy Regarding Children 6

2.6 Disability Services 6

2.7 Commitment to Diversity 6

3.0 Blackboard (When used) 6

4.0 Blackboard Discussion Board 6

5.0 Attendance 7

6.0 Student Email 7

7.0 Special Accommodations & Student Services 7

8.0 Tutoring 7

9.0 Student Success Specialist, Science Technology Engineering and Math (STEM) 7

10.0 Family Educational Rights and Privacy Act (FERPA) 8

11.0 MyNCC (Credit students only) 8

12.0 NCC Alerts 8

13.0 Weather Closing 8

14.0 Smoking 9

15.0 Open Office (for your home computers only) 9

16.0 Lateness to Class 9

17.0 Consequences of Late Work or Missed Quizzes 9

18.0 Classroom Management 9

19.0 How Your Final Grade will be Determined 9

20.0 Grade Scale 10

21.0 Lab Dress Code 10

22.0 Required Student Supplied Personal Protective Equipment 10

23.0 Course Calendar And Schedule Of Assignments 11

1. **Student Learning Outcomes from the Course Outline**

Upon completion of this course the student will be able to:

1. Define the major mechanical, physical, and chemical properties of ferrous and non-ferrous metals.
2. Perform laboratory tests to determine the mechanical and physical properties of ferrous and non-ferrous metals.
3. Identify common heat treatment techniques and describe their effect on the chemical properties of ferrous and non-ferrous metals.
4. Describe the effect of temperature on the metallurgical structure, both heating and cooling.
5. Explain the types of nondestructive testing, how to perform them, and their limitations.
6. Demonstrate the ability to collect, analyze, document, and report research clearly, concisely, logically, and ethically; understand the standards for interpreting research and experimental data within engineering and technical communities.

**2.0 NCC POLICIES**

**2.1 Class Attendance and Withdrawal**

Class attendance and engagement in the learning process are critical factors in determining students' success in their courses. NCC students are expected to attend all class sessions of courses in which they are enrolled, and are responsible for all material presented in class sessions of these courses.

However, a student who misses class more than twice the number of weekly meetings of the class\* (or the equivalent in short term courses) may be withdrawn from the course by the instructor. Students who are withdrawn for poor attendance will receive a grade of W. Faculty may issue a withdrawal through the first 90% of the semester (14th week or equivalent in short term classes\*). After the 90% period, a student may not withdraw or be withdrawn.

In an internet-based online learning course, a student is considered to have missed the equivalent of more than twice the number of weekly meetings of a traditional classroom course in a consecutive two-week period if there has been no participation by the student in the class through submission of assignments, participation in discussion forums or contact with the professor in any way during the period.

Students who are withdrawn from the class for lack of attendance may appeal the enforced withdrawal to the instructor. If the Instructor agrees to reinstate the student, he/she will be required to complete a reinstatement form and return it directly to the Vice President, Enrollment & Student Affairs. If the appeal is denied, the student may speak with the appropriate academic dean and/or the Vice President, Enrollment & Student Affairs. Further discussion may take place with the faculty member, but the final decision on the withdrawal rests with the faculty member.

**2.2 Academic Honesty Policy**

Northampton Community College considers honesty to be essential to the learning experience. Academic honesty is one of the values that we expect members of the NCC community will apply in their work on this campus and take into their lives beyond NCC. Violations of academic honesty harm the learning experience and violate the expectations and values that the NCC community embraces. We expect all members of the NCC

**Student Responsibilities**

* Students are solely responsible for their work and for making sure that their work represents their own honest efforts to meet the goals of the course.
* They are responsible for showing that the work they present is theirs in whatever ways are deemed appropriate by the faculty for the course.
* They are responsible for learning and following the policies and expectations of the college and for understanding the consequences of actions that violate the policy on academic honesty.

**Faculty responsibilities**

* Faculty members are responsible for demonstrating academic honesty in their work.
* They are responsible for making their expectations related to academic honesty clear to their classes including which activities and resources are allowed and the consequences for violations in their courses.
* They are responsible for communicating violations of the academic honesty policy to students and their division Dean and to the Assistant Dean of Students (Bethlehem) or the Associate Dean of Students (Monroe).

**2.3 Academic Honesty Violations**

Violations of the academic honesty policy include any actions that attempt to gain academic credit for work that does not represent the student's own efforts and knowledge. They include, but are not limited to the following situations and examples:

* Cheating on examinations and quizzes-
  + Using notes, materials, and/or mechanical, electronic or technological devices not authorized by the instructor during examinations or quizzes.
  + Providing or receiving help on an examination or test in a manner not authorized by the instructor.
  + Buying, selling, improperly obtaining, or using any tests or examinations.
  + Taking an exam or quiz for another student and/or allowing another student to take an exam or quiz in one’s place.
  + Altering or adding answers on exercises, exams, or quizzes after the work has been graded.
* Plagiarizing -
* Using the ideas or words of others without appropriate quotation and documentation that acknowledges the source or sources -- in other words, presenting someone else's work as one's own.
* Copying, exact words, phrases or sentences without quoting and giving credit to the source.
* Using a paraphrased version of the opinions, work, or ideas of others without giving credit.
* The wrongful appropriation of all or part of someone else's literary, artistic, musical, mechanical, or computer-based work.
* Copying all or part of an assignment, (a research paper, lab report, or workbook) from another person or resource and presenting it as one’s own work.
* Purchasing an assignment and submitting it as one’s own work.
* Falsifying or inventing information, data or research material. Altering or forging records or submitting false records as part of course work or making false statements, excuses, or claims to gain academic credit or influence grading*.*
* Listing sources that were never consulted.
* Gaining unauthorized access to another person's or the College's computer system or tampering with or copying programs, files, data or access codes associated with coursework.
* Tampering with or damaging the work of others or preventing others from completing their own assignments.

**2.4 Penalties**

When a faculty member believes that a student has committed acts that violate the academic honesty policy, he or she will advise the student of the offense and the penalty imposed.

**A faculty member may apply one of the following penalties:**

1. A written warning with the requirement that the assignment be redone within the instructor's specified time. Faculty members are encouraged to report the incident and action to their division Dean and to the Assistant Dean of Students (Bethlehem) or the Associate Dean of Students (Monroe) using online Academic Honesty Violation Form.
2. A failing grade for the assignment or test.

Faculty members are encouraged to report the incident and action to their division

Dean and to the Assistant Dean of Students (Bethlehem) or the Associate Dean of

Students (Monroe) using the online Academic Honesty Violation Form.

1. An "F" grade for the course.

* If a faculty member issues an "F" grade in the course as a penalty for academic dishonesty, he or she must send a written report of the instance of cheating or plagiarism and the action taken to the division Dean and the Assistant Dean of Students (Bethlehem) or the Associate Dean of Students (Monroe) using the online Academic Honesty Violation Form.
* If the faculty member has given an "F" grade for the course as a penalty for a violation of academic honesty, a student may not withdraw from the course while the matter is under appeal or if it is resolved that the “F” grade stands.

**2.5 Policy Regarding Children**

Children of students and staff are discouraged from being on campus for extended periods of time unless officially registered in a college program. Children under the age of 16 may not be left unattended on campus.

Children are not permitted in class. The classroom instructor has the authority to make an exception to this policy for an emergency circumstance, using the following criteria: if at all possible, students must contact the instructor prior to the class to seek permission; students may not request this special exception more than twice in one semester; children may not be disruptive (i.e.-noisy, moving around, interfering with the teaching-learning process) or they will be asked to leave immediately with their parent/guardian.

Children accompanying parents to learning environments such as the Library or Learning Center may not be disruptive or they will be asked to leave immediately with their parent/guardian.

**2.6 Disability Services**

Northampton Community College encourages academically qualified students with disabilities to take advantage of its educational programs. Services and accommodations are offered to students with disabilities at no additional cost to facilitate accessibility to College programs and facilities. These services are based upon each student’s individual needs and must be indicated by current documentation of disability. For more information, you can contact the Coordinator of Disability Services at 610-861-5342 or TDD (610) 861-5351 or view the Disability Services Webpage by following these links from the NCC home page (<http://www.northampton.edu>): Administration > Student Services > Students With Disabilities

**2.7 Commitment to Diversity:**

Northampton Community College is committed to creating and fostering a learning and working environment based on open communication and mutual respect. This is an integral part of the Colleges academic mission to enrich our students' educational experiences and prepare them to live in and contribute to a global society.

If you encounter sexual harassment, sexual misconduct, sexual assault, or discrimination based on race, color, religion, age, national origin, ancestry, sex, sexual orientation, gender identity, or disability please contact the Equal Opportunity Office at 610-861-5496 or [hwhitaker@northampton.edu](mailto:hwhitaker@northampton.edu).

**If you see it, report it northampton.edu/reportit**

**3.0 Blackboard (When used)**

If Blackboard is being used in your section, all course information will be available through Blackboard.

**4.0 Blackboard Discussion Board**

Students enrolled in the welding program can use Blackboard to communicate with their instructor if needed.

**5.0 Attendance**

Attendance is required on all dates and times prescribed by course schedule. If you must miss class it is your responsibility to make arrangements to make up the missed classwork.

**6.0 Student Email**

Credit students have been assigned an NCC email account. If you don’t know what your password is, or forgot your password, contact the records office. Any email correspondence from your instructor will be sent to your NCC email account. You can easily have your NCC account forwarded to another account of your choice. If you forward your NCC email to another account, test the forwarding to ensure that you won’t miss any NCC emails.

Please check your email at least once per day.

**7.0 Special Accommodations & Student Services**

Reasonable accommodations are available for any student working with the Student Disabilities Service Office to ensure that you have a fair opportunity to meet the objectives of this class. The phone number of this office is: 610.861.5342

**Other Services:**

Advising/Transfer Services 610.861.5346

Career Services 610.861.5344

Counseling 610.861.5342

Dean of Business & Technology 610.861.5399 (secretary)

Dean of Students 610.861.4558

**8.0 Tutoring**

Tutoring is not available for this course in the Learning Center. If tutoring is needed, contact your instructor and he/she will make appropriate arrangements to get you help.

**9.0 Student Success Specialist, Science Technology Engineering and Math (STEM)**

As a technology student you have access to the NCC student success specialist:

Robert Colletta Email: [rcolletta@northampton.edu](mailto:rcolletta@northampton.edu)

Robert is an academic and career services advisor for students majoring in the technology career programs. Please contact Robert for assistance developing your college success skills such as time management, test taking preparation and study strategies. You can contact Robert to get help registering for classes on MyNCC and to complete a long-term academic plan to prepare you for graduation. Also, Robert can assist you with any part of your job search such as resume writing, interview preparation and identifying employment opportunities.

**10.0 Family Educational Rights and Privacy Act (FERPA)**

FERPA is the Family Educational Rights and Privacy Act and Notice of Publication of Campus Crime and Graduation Statistics. The Family Education Rights and Privacy Act (FERPA) afford students certain rights with respect to their educational records. These rights can be read on the NCC website at: FERPA

If grades need to be sent to anyone other than yourself please complete the Student Release of Information form and submit it to your instructor.

**11.0 MyNCC (Credit students only)**

Informational FAQ’s about MyNCC can be found online at: https://myncc.northampton.edu/ics/ .

**12.0 NCC Alerts**

NCC Alerts is a notification system that enables the school to send urgent news to your cell phone and/or email address. All students are encouraged to register for this service. Once you sign up for the service, the college can text your cell phone and/or email you with timely information about emergencies and weather-related closings and delays.

Depending on your personal cell phone plan, there may be a nominal fee from your carrier to receive text messages; however, there is no charge from the school to use the service. The service is available to all current credit students, faculty/staff and parents of children in the child care centers. Students who would like their parents to also receive text messages can add an additional mobile number to their account.

This system will not address individual class cancellations; only campus-wide closings and delays. For individual announcements visit the Class Cancellations site.

To sign up for the alert service go to http://webapp.northampton.edu/alerts/

If you have any questions or problems setting up your account please call: 1.800.936.3525.

**13.0 Weather Closing**

When hazardous driving conditions exist due to snow or ice, one of three actions is taken:

1. Classes canceled

Day or evening classes canceled. A separate decision will be made for day and evening classes. The decision for day classes is usually made by 6:30 A.M. and no later than 7:00 A.M. and for evening classes a decision is made by 3:00 P.M. and no later than 3:30 P.M.

2. Classes delayed

If the college declares that classes will not start until 10:00 A.M., any classes affected by this decision are cancelled and the normal schedule begins with classes scheduled to start at or after the delayed starting time.

1. Classes are being held on a normal schedule

NCC recognizes that conditions may vary across the vast service area and in some cases the college might be operating on a normal schedule even though the driving conditions might be hazardous where you are coming from. If you decide to not attend class due to weather conditions when the college is open please contact your instructor with your intent. If there is an assignment due, a quiz or test scheduled for that date it will most likely be rescheduled.

You will be able to find out what’s going on at the college by signing up for NCC Alerts, by logging onto the college website or by tuning into radio stations WAEB, WCTO, WEEX, WEST, WGPA, WLEV, WODE, WTKZ, WXKW, WZZO or television stations WNEP-TV (channel 16) and WFMZ-TV (Channel 69.1). You can also call the Weather Closing Information Line 24-hours a day at: 610.861.4595.

**14.0 Smoking**

Most students recognize the negative effect that smoking can have on their health and the health of people breathing in second-hand smoke. Smoking cessation support is provided through the Health and Wellness Center in College Center 120 or at: 610.861.5365. Education, counseling, peer support and nicotine replacement therapy are available.

As part of the college’s commitment to the health and well-being of the college community, smoking and use of any tobacco or other such product is prohibited throughout all college buildings. There are limited areas to smoke outside. You should assume that you are in a non-smoking area unless otherwise designated by signage. There is a $100 fine for smoking in non-smoking areas.

For exact locations of smoking areas refer to: Map of smoking areas. This map is not up-to-date. There is a smoking area by the large rocks on the north side of Hartzell Hall.

**15.0 Open Office (for your home computers only)**

Students that do not have Microsoft Office installed on their home computers and do not have the ability to use the computers on campus can download and install Open Office on their home computers. Open Office is free and has complete compatibility with the Microsoft Office Suite. Open Office can be downloaded from the Open Office website. Make sure to check the compatibility with your operating system.

**16.0 Lateness to Class**

Students will not be graded on attendance; however, however, lateness may impact the student’s class participation grade.

**17.0 Consequences of Late Work or Missed Quizzes**

Assignment details and due dates can be found in Section 23.0 “Course Calendar And Schedule Of Assignments” or in class. Assignments are not accepted late and missed exams will receive a grade of **“0”.**

**18.0 Classroom Management**

Cell Phone, Electronic devices should be turned off during classes and exams.

**19.0 How Your Final Grade will be Determined**

Written exams are used to assess your understanding of the major mechanical, physical, and chemical properties of ferrous and non-ferrous metals and the types of destructive and nondestructive testing and their limitations.

Practical exams and lab tasks are used to assess your ability to perform destructive and nondestructive to determine the mechanical and physical properties of ferrous and non-ferrous metals.

Lab reports and research papers are used to demonstrate your ability to collect, analyze, document, and report research clearly, concisely, logically, and ethically; understand the standards for interpreting research and experimental data within engineering and technical communities

Students will not be graded on attendance; however, lateness and missed classes may impact the student’s class participation grade.

**20.0 Grade Scale**

Research Papers - 50%

Lab Reports – 20%

Oral Presentation – 10%

Midterm Exam – 10%

Final Exam – 10%

**Final Grade:** Grading scale is used as follows.

**A** 94 – 100% **C+** 77 – 79%

**A-** 90 – 93% **C**  73 – 76%

**B+** 87 – 89% **C-** 70 – 72%

**B** 83 – 86% **D** 60 – 69%

**B-** 80 – 82% **F**  <60%

**21.0 Lab Dress Code**

Students working in the welding lab will follow the following dress code for welding. There will be no exceptions.

* Safety Glasses will be worn at all times in the lab area.
* Proper welding helmet, gloves, hat, and jacket will be worn when welding at all times.
* Long hair will be tied back so as to not get caught in equipment, bangs will be tied back so as to not interfere with vision while working with equipment.
* Students must wear work boots at all times in the lab. No open toe shoes are allowed.
* Blue jeans or equivalent work pants, with no tears or frays, will be worn at all times. No polyester clothing or flannel shirts.
* Long sleeved shirt must be worn and tucked in when welding.
* No loose clothing

**22.0 Required Student Supplied Personal Protective Equipment**

* + - Welding helmet (flip-up or auto-darkening style)
    - Welding gloves (“Stick” and “TIG” welding style)
    - Safety glasses (polycarbonate w/ side shields)
    - Welding jacket (hybrid w/ leather sleeves, or all leather)
    - Welding hat (must be designed for welding, 100% cotton)
    - Work boots (must be at least 6 in. high and all leather)
    - Work pants (must be 100% cotton with no tears or frays)
    - Work shirt (100% cotton long sleeve to go under jacket)
    - Ear plugs (disposable)

**23.0 Course Calendar And Schedule Of Assignments**

***Note:*** The instructor reserve the right to change topics or assignments when necessary to make classes more relevant to current events or required student outcomes. Therefore, you should not submit assignments ahead of schedule unless you have obtained permission to do so. Check Announcements in Blackboard and the Assignments page for details and/or changes to assignments.

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| **Session** |  | **Topics** |
| 1/20/2017 | LECTURE | Orientation and Introduction to Metallurgy and Non-Destructive Testing |
| HOMEWORK | Reading subjects in textbook: Introduction to Metallurgy and Terminology |
|  | LECTURE | Non-Destructive Testing - Visual and Liquid Penetrant test./Material Properties |
| LAB EXERCISE(S) | Lab Exercise 1- Material Properties |
| HOMEWORK | Reading subjects in textbook: Introduction to Metallurgy and Terminology  Assign lab report on Lab Exercise 1. |
| 1/27/2017 | LECTURE | Non-Destructive Testing - Magnetic Particle and Ultrasonic Testing |
| LAB EXERCISE(S) | Lab Exercise 2- Hardness Testing/Charpy & Rockwell |
| HOMEWORK | Reading subjects in textbook: Introduction to Properties of Metals Assign lab report on Lab Exercise 2. |
|  | LECTURE | Introduction to Properties of Metals – Hardness  Research Paper #1 |
| HOMEWORK | Reading subjects in textbook: Properties of Metals - Hardness  Lab Exercise 1- Material Properties report due.  Assign Research Paper #1 |
| 2/3/2017 | LECTURE | Introduction to Properties of Metals – Material Properties |
| LAB EXERCISE(S) | Lab Exercise 3- Hardness Testing |
| HOMEWORK | Reading subjects in textbook: Properties of Metals - Material Properties  Assign Lab Exercise 3- Hardness Testing  Lab Exercise 2- Magnetic Particle Testing lab report due. |
|  | LECTURE | Introduction to Properties of Metals - Material Properties |
| LAB EXERCISE(S) | Lab Exercise 4 – Tensile Test |
| HOMEWORK | Assign Lab Exercise 4 – Tensile Test  Lab Exercise 3- Hardness Testing lab report due. |
| 2/10/2017 | LECTURE | Introduction to Properties of Metals |
| HOMEWORK | Review for Midterm  Lab Exercise 3- Hardness Testing lab report due. |
|  | LECTURE | Midterm |
| HOMEWORK | Reading subjects in textbook: Ferrous Metallurgy  Lab Exercise 4 – Tensile Test lab report due. |
| 2/17/2017 | LECTURE | Ferrous Metallurgy  Research Paper #2 / Oral Presentation |
| HOMEWORK | Reading subjects in textbook: Iron-Carbon Diagram  Assign Research Paper #2 |
|  | LECTURE | Metallurgy: Iron-Carbon Diagram |
| HOMEWORK | Reading subjects in textbook: Microstructural Analysis  Research Paper #1 due. |
| 2/24/2017 | LECTURE | Metallurgy: Microstructural Analysis |
| LAB EXERCISE(S) | Lab Exercise 5- Preparing a sample of metal for microscopic observation |
| HOMEWORK | Assign Lab Exercise 5- Preparing a sample of metal for microscopic observation |
|  | LAB EXERCISE(S) | Lab Exercise 5- Preparing a sample of metal for microscopic observation |
| 3/3/2017 | LECTURE | Metallurgy: Heat Treating |
| LAB EXERCISE(S) | Lab Exercise 6 – Hardening and Annealing |
| HOMEWORK | Assign Lab Exercise 6 – Hardening and Annealing  Lab Exercise 5- (continue) Preparing a sample of metal for microscopic observation |
|  | LECTURE | Student’s Presentation  Review for Final Exam |
| HOMEWORK | Lab Exercise 6 – Hardening and Annealing lab report due.  Research Paper #2 due. |
|  | LECTURE | Review for Final Exam |
| 3/10/2017 | FINAL EXAM | Final Exam |