

# JOHN JAY COLLEGE OF CRIMINAL JUSTICE

## The City University of New York

524 W. 59th Street, New York, NY 10019

NSC 107 LECTURE SYLLABUS

Summer 2014

Text: Natural Science Revised (2013) 6th Edition

Lecturer: W. Bailey ([wbailey@jjay.cuny.edu](mailto:wbailey@jjay.cuny.edu)) Rm. 3.77A ☎ 212.237.8943 / Office Hrs. By Appt. M/W 2:30 pm to 4:30 pm

Science in Modern Society

M/W Sects. 01 & 02 ⇨ 11:45 am - 2:15 pm

Web Site: <http://jjcweb.jjay.cuny.edu/wbailey>

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### NSC 107 – Introduction to Science in Society

**Credits/hours:** 6 hours: 3 hours lecture, 1 1/2 hours recitation, 1 1/2 hours laboratory; 4 credits

**Course Summary:** A course in the basic principles of atomic and molecular physical science, including concepts of measurement and data collection, the scientific method, the structure of matter and living organisms, with emphasis on the relationships between science and society.

#### Learning Outcomes

##### *Reasoning*

- Explain the basic steps of problem solving.
- Critically evaluate statements of “fact” or discovery in the media.
- Recognize science as a creative process.
- Differentiate between data analysis and interpretation.
- Discriminate between scientific and non-scientific resources.
- Judge the merit of scientific vs. pseudo-scientific conclusions.

##### *Knowledge*

- Collect, analyze and interpret data.
- Quantify uncertainty in measurements.
- Describe the basic components of a scientific investigation, and contrast this with non-scientific statements.
- Correctly use basic terminology in chemistry and biology.
- Recognize basic concepts in the physical and/or biological sciences toward interpreting the nature of scientific discoveries.

##### *Practical skills*

- Demonstrate safe lab practices.
- Outline the basic modes of measurement.
- Identify basic laboratory equipment and practice methods of experimentation and investigation.

##### *Communication*

- Practice forms of written and/or oral communication in the laboratory.
- Differentiate between popular and scientific writing and communication.

**Prerequisites:** MAT 104 or MAT 105 or the equivalent. May not be taken after CHE 108, ENV 108, FOS 108 or PHY 108.

#### Requirements/Course Policies

##### LECTURE

- ☑ STUDENTS ARE EXPECTED TO BE RESPECTFUL AND RESPONSIBLE IN THE CLASSROOM AT ALL TIMES.
- ☑ ALL CELL PHONES, I-PADS AND OTHER ELECTRONIC DEVICES MUST BE TURNED OFF BEFORE ALL CLASSES.
- ☑ **THERE WILL BE NO MAKE-UP EXAMS.** IF A STUDENT MISSES EITHER EXAM 1 OR 2, THE REMAINING GRADES WILL BE CONVERTED TO **33 $\frac{1}{3}$**  POINTS EACH. ONLY STUDENTS TAKING THE FIRST TWO LECTURE EXAMS WILL RECEIVE AN ADDITIONAL BONUS OF 10 POINTS ON THE FINAL EXAM SCORE.
- ☑ **YOUR PERSONAL JOHN JAY PHOTO ID MUST BE PRESENTED AT ALL LECTURE EXAMS.** FAILURE TO SHOW A CURRENT JOHN JAY PHOTO ID OR PHOTO ID ACCEPTABLE TO THE INSTRUCTOR RESULTS IN DEDUCTED POINTS.
- ☑ STUDENTS ARE REQUIRED TO USE **#2 PENCILS** FOR ALL LECTURE EXAMS. PENCILS WILL **NOT** BE

- PROVIDED. POINTS WILL BE DEDUCTED IF THE INSTRUCTOR HAS TO GRADE THE SCANTRON BY HAND.
- ☑ **NO** PROGRAMMABLE CALCULATORS, CELL PHONES, iPADS, OR POCKET P.C.s (includes PDAs) ARE TO BE USED DURING EXAMS OR LAB QUIZZES.
  - ☑ TO AVOID A SEVERE POINT DEDUCTION PENALTY, PLEASE ATTEND YOUR SCHEDULED LECTURE EXAM.

**Required Text (includes the lab manual):** *Natural Science* Revised 6th Ed. by Carpi, A. & Egger, A., Kendall Hunt, Inc., Iowa (2013). Sold at the John Jay bookstore.

**TEXT ISBN:** 978-1-4652-3479-7 and **LAB MANUAL ISBN:** 978-1-4652-3476-6

**Course Web Site:** <http://www.visionlearning.com/myclassroom>

### Score Calculation ↓

<b>GRADING SCALE:</b>	LECTURE EXAM 1	=	20 POINTS	<b>or,</b> your score #1 _____	× 0.20
	LECTURE EXAM 2	=	20 POINTS	<b>or,</b> score #2 _____	× 0.20
	FINAL EXAM	=	25 POINTS	<b>or,</b> final score _____	× 0.25
	LAB GRADE	=	35 POINTS	<b>or,</b> lab score _____	× 0.35
	TOTAL	=	100 POINTS	➔ <b>add</b> for total points out of 100	

### COURSE CALENDAR

<u>Date</u>	<u>Lecture Outline</u>	<u>Reading Assignment</u>
W 5/28	The Practice of Science – Matter and Energy	<ul style="list-style-type: none"> <li>▪ <b>Scientific Method</b> ⇒ pp. 12-21, <b>Temperature</b> ⇒ pp. 85-88, <b>Energy</b> ⇒ pp. 93-95, <b>Matter</b> ⇒ pp. 96-101 &amp; <b>States of Matter</b> ⇒ pp. 105-109 ♦ Incl. quizzes at the end of each lesson.</li> </ul>
M 6/2	Atomic Structure	<ul style="list-style-type: none"> <li>▪ <b>Atomic Theory I</b> ⇒ pp. 115-118 &amp; <b>Atomic Theory II</b> ⇒ pp. 119-122 ♦ Incl. quizzes. <b>Note Atomic Theory II quiz:</b> Ques. 11 (p. 122) is on-line interactive.</li> </ul>
W 6/4	The Periodic Table and Chemical Reactions	<ul style="list-style-type: none"> <li>▪ <b>The Periodic Table of Elements</b> ⇒ pp. 123-127 &amp; <b>Chemical Reactions</b> ⇒ pp. 128-131 ♦ Incl. quizzes.</li> </ul>
M 6/9	Chemical Bonding	<ul style="list-style-type: none"> <li>▪ <b>Chemical Bonding</b> ⇒ pp. 132-138 ♦ Incl. quiz.</li> </ul>
<b>W 6/11</b>	<b>LECTURE EXAM 1</b>	
M 6/16	Acids, Bases and The Concept of pH	<ul style="list-style-type: none"> <li>▪ <b>Acids and Bases</b> ⇒ pp. 147-150 ♦ Incl. quiz.</li> </ul>
W 6/18	Balancing Chemical Equations	<ul style="list-style-type: none"> <li>▪ <b>The Mole</b> ⇒ pp. 111-114 &amp; <b>Chemical Equations</b> ⇒ pp. 139-142 ♦ Incl. quizzes. <b>Omit Questions 4 - 7 on p. 114 and Question 8 on p. 142.</b></li> </ul>
M 6/23	Nuclear Chemistry	<ul style="list-style-type: none"> <li>▪ <b>Nuclear Chemistry</b> ⇒ pp. 151-155 ♦ Incl. quiz. <b>Omit Questions 6 and 7 on p. 155.</b></li> </ul>
W 6/25	Organic Chemistry	<ul style="list-style-type: none"> <li>▪ <b>Organic Chemistry</b> ⇒ pp. 196-201 ♦ Incl. quiz.</li> </ul>
<b>M 6/30</b>	<b>LECTURE EXAM 2</b>	
W 7/2 & M 7/7	Biochemistry – The Energy Nutrients	<ul style="list-style-type: none"> <li>▪ <b>Carbohydrates</b> ⇒ pp. 202-205 &amp; <b>Fats and Proteins</b> ⇒ pp. 206-210 ♦ Incl. quizzes.</li> </ul>
W 7/9	Nucleic Acids and Protein Synthesis	<ul style="list-style-type: none"> <li>▪ <b>DNA II</b> ⇒ pp. 218-226 ♦ Incl. quiz.</li> </ul>
M 7/14	The Immune System and AIDS	<ul style="list-style-type: none"> <li>▪ <b>Lecture Notes</b> also <b>See on-line Module 29 ⇒ Immune Cells &amp; HIV (Science Daily) link.</b></li> </ul>
<b>W 7/16</b>	<b>FINAL LECTURE EXAM</b>	



*Department of Sciences*

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## **ATTENDANCE**

Students are expected to attend all class meetings as scheduled. Excessive absence may result in a failing grade for the course and may result in the loss of financial aid. The number of absences that constitute excessive absence is determined by the individual **lab** instructor, who announces attendance guidelines at the beginning of the semester in the syllabus for the course. Students who register during the Change of Program period after classes have begun are responsible for the individual course attendance policy.

There will be no make-up exams. If a student misses either exam 1 or 2, the remaining grades will be converted to **33 $\frac{1}{3}$**  points each. Only students taking the **first two** lecture exams will receive an additional bonus of 10 points on the final exam score.

## **Grade of INC (Incomplete)**

An Incomplete Grade may be given only to those students who would pass the course if they were to satisfactorily complete course requirements. It is within the discretion of the faculty member as to whether or not to give the grade of Incomplete.

**Accommodations for Students with Disabilities:** Students with hearing, visual, or mobility impairments; learning disabilities and attention deficit disorders; chronic illnesses and psychological impairments may be entitled to special accommodations under the Americans with Disabilities Act (ADA). In order to receive accommodation, students must register with the Office of Accessibility Services (O.A.S., Room L.66.10NB, 212-237-8185, <http://www.jjay.cuny.edu/2023.php>) which will define, for both students and faculty, the appropriate accommodations. Faculty are not allowed to work directly with students to attempt to accommodate disabilities, and accommodations cannot be applied retroactively (after-the-fact).

**Statement of the College Policy on Plagiarism:** Plagiarism is the presentation of someone else's ideas, words, or artistic, scientific, or technical work as one's own creation. Using the ideas or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. It is the student's responsibility to recognize the difference between statements that are common knowledge (which do not require documentations) and restatements of the ideas of others. Paraphrase, summary, and direct quotation are acceptable forms of restatement, as long as the source is cited. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has free guides designed to help students with problems of documentation.

This course will utilize the services of **Turnitin.com**, a plagiarism prevention system approved by the College Council. All students must submit an **electronic copy** of their final paper using either the Word, WordPerfect, RTF, PDF or HTML format (**including the reference page**) to **Turnitin.com** for processing by the date listed. **In addition**, a **printed original** must be submitted to the lab instructor by the scheduled date (instructors may also require an electronic copy). All electronic files should be scanned for viruses **before** submission. Students transmitting electronic viruses will be **heavily** penalized.

**Additional Services:** Tutoring is available free of charge for this course in the **Mathematics & Science Resource Center (MSRC)**. The center also has a computer lab with internet access and a room for quiet study.

How do you get the most out of a tutoring session?

(cont.)

- i. *Start right away.* Students who begin tutoring from the beginning of the semester typically do better than those who wait.
- ii. *Book your appointments early.* During peak times, you may need to book at least a week in advance to get the times you want. To book your own appointments over the web, first read the instructions on the MSRC web site, then log on to TutorTrac at the URL below.
- iii. *Come prepared.* Please bring your class notes and textbook. Look over the reading and try the problems. If you can, bring a list of specific questions. The more you prepare, the more you will get out of the session.
- iv. If you miss a class, please get notes from a classmate *before* your session. Tutoring is not a substitute for attending class.
- v. If you are repeating the course (previous grade of “F” or “W”), you are eligible to participate in the Math Advancement Program (MAP) which provides weekly one-on-one tutoring with an experienced tutor. Please see Ms. Michele Doney in room 1.94 NB more for details.

Contact Information for the MSRC, room 1.94 NB:

Phone: (646) 557-4635

Email: [msrc@jjay.cuny.edu](mailto:msrc@jjay.cuny.edu)

MSRC Website: <http://www.jjay.cuny.edu/academics/592.php>

TutorTrac (for scheduling appointments): <https://jjctutortrac.jjay.cuny.edu>



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NSC 107 LAB

Instructor: \_\_\_\_\_

Name: \_\_\_\_\_

Section \_\_\_\_\_

**LAB POLICY**

- GRADING SCALE: LAB GRADE REFLECTS 35% OF LECTURE GRADE**
- CELL PHONES, i-PADS AND OTHER ELECTRONIC DEVICES MUST BE TURNED OFF BEFORE ALL CLASSES.**

**LAB PARTICIPATION: (5 points)** Includes adherence to safety rules, attendance, punctuality and lab station cleanup. Individual and group participation will be evaluated.

An attendance roster will be read at the beginning of the period and **closed 15 minutes after** the start of the session. Any persons who have not responded by that time or arrive later will be counted as late. **Two** lateness marks will equal **one** absence. **Three** absences will incur a deduction of **one** point from lab participation. Students arriving late must contact the instructor at the end of the session **before** leaving the lab to receive credit for attending.

**IN-CLASS LAB REPORTS: (5 points)** Students are required to complete all labs during the lab period.

- **92-100 pts.** A completed/excellent lab score
- **85-91 pts.** A completed/above average lab score
- **80-85 pts.** A completed/average lab score
- **Below 80 pts.** An incomplete/poor quality lab score

**No make-up labs will be given. Late labs will not be graded.** Report sheets should be **legibly** filled out in **black ink only**. Lab **report sheets** can be printed off from Blackboard. PLEASE TURN IN SEPARATE LAB REPORT SHEETS ONLY. LAB MANUALS WILL **NOT** BE COLLECTED.

Students are required to observe **all** safety rules, including wearing safety glasses during lab work and cleanup. **STUDENTS WITHOUT SAFETY GLASSES WILL BE BARRED FROM THE LAB FOR THAT PERIOD AND WILL RECEIVE AN ABSENT MARK. LAB INSTRUCTORS WILL NOT SUPPLY SAFETY GLASSES FOR ANY STUDENT. INSTRUCTORS ALSO HAVE THE AUTHORITY TO BAN STUDENTS WEARING OPEN FOOTWEAR FROM PERFORMING LABS.**

**13 QUIZZES: (≅ 1.92 points each for a total of 25 points)**

Starting Wednesday, June 4 for Section 01 and Thursday, June 5 for Section 02, a quiz of approximately 5 questions will be given **15 minutes after the beginning of each session**. Students will be allowed **20 minutes** to complete the quiz. Questions will include multiple choice, fill-ins and calculations using a non-programmable calculator—**no cell phones**. Calculators may **not** be shared. Students are required to write legibly and answer all questions using either a **black** ink pen or pencil. **Students arriving after the quiz has begun will be counted as late and will only be given the remaining part of the 20 minute limit to complete the quiz. A student who arrives after the quizzes are collected, or is absent for that day will not be allowed to take the quiz—regardless of the nature of the excuse.** The **best 10** (2.5 pts. ea.) **out of 13** quizzes will count toward the student's final lab grade.

**OFFICE HOURS: By appointment only.** For scheduled office hours, please see your lab instructor.



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NSC 107 LAB SYLLABUS – Summer 2014

Section \_\_\_\_\_

6th Ed. Lab Manual - Carpi & Bailey (download report pages from Blackboard)

Date	Lab #	Experiment
W 5/28 Sec. 01 Th 5/29 Sec. 02 <b>(NOTE: All sessions incl. both recitation and lab)</b>	Intro	<ul style="list-style-type: none"><li>Safety Rules p.vi</li><li>Intro to the Metric System: Units of Measure, Unit Conversion, and Problem Solving.</li><li><b>Group work:</b> Metric system, scientific notation and significant figures worksheets. Finish for homework. <b>REQUIRES A NON-PROGRAMMABLE CALCULATOR.</b></li></ul>
M 6/2 Sec. 01 Tu 6/3 Sec. 02	1	<ul style="list-style-type: none"><li><b>Group work sheets - Review Metric System, Sci. Notation &amp; Sig. Figs. homework</b> in 5/28 recitation → See The Metric System pp. 81-84 of lecture text. Also view The Metric System <b>on-line</b> and <i>Further Exploration</i> section on <i>Basic Math: Scientific Notation</i> at end of on-line lesson.</li><li>The Metric System <b>(Part 1)</b> pp.1-3</li></ul>
W 6/4 Sec. 01 Th 6/5 Sec. 02	2a 2b	<ul style="list-style-type: none"><li>Measuring Liquids <b>(Part 2)</b> p.5</li><li>Density Determination <b>(Part 3)</b> pp.5-7 → See Density pp. 89-92 of lecture text. Also view Density <b>on-line</b> and <i>Resources</i> and <i>Further Exploration</i> sections at end of on-line lesson.</li></ul>
M 6/9 Sec. 01 Tu 6/10 Sec. 02	7 6	<ul style="list-style-type: none"><li>Formula Writing pp.27-29</li><li>Conductivity pp.23-25</li></ul>
W 6/11 Sec. 01 Th 6/12 Sec. 02	5	<ul style="list-style-type: none"><li>Model Building pp.17-22</li></ul>
M 6/16 Sec. 01 Tu 6/17 Sec. 02	3 4	<ul style="list-style-type: none"><li>Conservation of Mass in Chemical Reactions pp.9-11</li><li><b>VIDEO:</b> Decomposition Reactions-Electrolysis of Water pp.13-15</li></ul>
W 6/18 Sec. 01 Th 6/19 Sec. 02	10a 10b	<ul style="list-style-type: none"><li>pH of Common Substances p.39-41 <b>(Part 1– Labs 10a &amp; b)</b></li><li>pH of Over-the-Counter Drugs p.42</li></ul>
M 6/23 Sec. 01 Tu 6/24 Sec. 02	11	<ul style="list-style-type: none"><li>Acid-Base Titration <b>(Part 2)</b> pp.43-45</li></ul>
W 6/25 Sec. 01 Th 6/26 Sec. 02	13	<ul style="list-style-type: none"><li>Manufacturing Aspirin <b>(Part 1)</b> pp.51-55</li></ul>
M 6/30 Sec. 01 Tu 7/1 Sec. 02	14	<ul style="list-style-type: none"><li>Weighing dried <b>Lab #13</b> sample &amp; determining % yield.</li><li>Analgesics and Thin-Layer Chromatography <b>(Part 2)</b> pp. 57-59</li></ul>
W 7/2 Sec. 01 Th 7/3 Sec. 02	16	<ul style="list-style-type: none"><li>Nutrients in Foods <b>(Part 1)</b> Carbohydrates &amp; Proteins pp.65-70</li></ul>
M 7/7 Sec. 01 Tu 7/8 Sec. 02	17	<ul style="list-style-type: none"><li>Nutrients in Foods <b>(Part 2) Fats &amp; Iodine Number</b> pp.71-76</li></ul>
W 7/9 Sec. 01 Th 7/10 Sec. 02	15	<ul style="list-style-type: none"><li>Making Soap pp.61-63</li></ul>
M 7/14 Sec. 01 Tu 7/15 Sec. 02	18 19	<ul style="list-style-type: none"><li>The Cell <b>(Part 1)</b> pp.77-84</li><li>DNA and Protein Sequencing <b>(Part 2)</b> pp.85-87</li></ul>

**GRADING SCALE:** LAB GRADE REFLECTS 35% OF LECTURE GRADE

- Monday through Thursday include recitation (R) **and** lab (L). You must attend the specified days to receive full credit for lab.
- Lab participation includes adherence to safety rules, attendance, punctuality and lab station cleanup.
- Please do not bring food or beverages into the lab. Do not dispose of food in the waste receptacles.**
- For your protection please do not wear any open footwear (e.g. sandals, etc.) in the lab.**
- All labs will be performed on the scheduled day and time only. **NO MAKE-UP LABS.**
- Each individual is responsible for lab station cleanup—not the lab technician!
- A quiz is given during each lab session starting Wednesday, June 4. NO MAKE-UP QUIZZES.**
- NO PROGRAMMABLE CALCULATORS, CELL PHONES, iPADS, POCKET P.C.s (incl. PDAs) ARE ALLOWED FOR QUIZZES.**