

Spring 2009 Syllabus for PHYS 215: Science, Technology, and Society

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| Course Information | <p>Sec 701: Tue & Thur 8:00 – 9:15 am, 701WG 2306 (#22389) A. Baski + S. Khanna Sec 702: Tue & Thur 2:00 – 3:15 pm, 701WG 2306 (#22390) S. Khanna + N. Jones</p> <p>This course will examine a select number of scientific “breakthroughs” that have led to transformational technologies which continue to impact society today. Topics will be developed from a historical perspective, to a basic understanding of the scientific principles, to examples of technological advances, and finally to the societal impact of these breakthroughs.</p> <p>During this semester, the following topics will be examined:</p> <ol style="list-style-type: none"> 1) Discovery of the electromagnetic spectrum and the communications revolution; 2) Discovery of nuclear fission and issues today with nuclear power and weapons; 3) The paradigm shift of quantum mechanics and today’s technologies based on nanotechnologies; 4) Discovery of semiconductors and device technologies based on these materials. <p>The learning objectives of this course include development of the following skills: critical thinking, quantitative analysis, awareness of current science and technology issues, written reflection of course concepts, and oral communication.</p> <p>This course will utilize Blackboard (Bb) at blackboard.vcu.edu and LON-CAPA (Learning Online Network – Computer Assisted Personalized Approach) at loncapa.vcu.edu. Details of how to use LON-CAPA are available in Bb under Course Information.</p> |
| Instructors | <p>Dr. Alison Baski 701 W. Grace St., Laurel St. entrance, Rm. 2411, 828-8295 aabaski@vcu.edu <i>Office Hours:</i> Tue 9:30-10:30am, 12:30-1:30pm or by appointment. Dr. Shiv Khanna Rm. 2407, 828-1820, snkhanna@vcu.edu Dr. Naiche Jones Rm. 2417, 828-1950, s2nojone@vcu.edu</p> |
| Prerequisites | MATH131 or STAT208 or equivalent or higher. |
| Required Materials | <p>Students are required to purchase a CPS remote “clicker” and register it online in Blackboard (see In-Class Participation).</p> <p>There is no required textbook for this course. The lecture notes will be available in LON-CAPA.</p> |
| Grading Policy | <p>15 % In-class Participation (each lecture worth ~0.6 %) 10 % Presentations (each worth 3.3 %) 15 % Journal (due Sun by 11 pm; each worth 1.1 %) 20 % Homework (due Tue by 11 pm; each worth 1.4 %) 20 % Quizzes (due Sun by 11 pm; each worth 2.9 %) 20 % Final Exam</p> <p>Letter grades will be assigned on the following scale: A: 90.0-100%, B: 80.0-89.9%, C: 70.0-79.9%, D: 60.0-69.9%, and F: <60%</p> <p><u>Note:</u> You must attend a <u>minimum of 20 class periods</u> (of 29 total) in order to earn higher than a grade of “D” in this course.</p> |
| In-Class Participation 15 % No excused absences Two lowest grades dropped | <p>During lectures, a number of questions will be asked throughout the period that you will answer using a CPS “clicker”. Your participation grade will be based on clicking in answers <i>throughout</i> the class period, and will not be based on accuracy. Students will answer questions after working on them on their own and then discussing them with their classmates. It is <u>your responsibility</u> to have an operational clicker at every lecture. It is therefore highly recommended that you carry spare batteries. Participation will begin for credit on 1/20/09. There will be <u>no excused</u> absences and <u>no accommodations</u> for missing/broken clickers; however, the <u>two lowest</u> participation grades will be <u>dropped</u>.</p> <p>Attendance of this course is <i>very important</i> due to in-class activities and student interactions. Therefore, you must attend a <u>minimum of 20 class periods</u> (of 29 total) in order to earn higher</p> |

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| | <p>than a grade of “D” in this course.</p> <p>To register your clicker for this course, go to Blackboard and do the following: 1) choose "Tools" button – "CPS Connection" – "Register clicker OR Update your serial number"; 2) Complete steps #1 to #4. (Your serial number appears on the clicker screen when turned on.) Do not "loan" your clicker to another student, as that is an honor code violation.</p> |
| <p>Presentations 10 %</p> | <p>Each class period will begin with three students giving short presentations on current science or technology issues. There are two primary purposes of these presentations: 1) to have students become familiar with current science/technology issues on a weekly basis, and 2) to practice giving oral presentations. There will be a schedule where each student will present a total of three presentations throughout the semester.</p> <p>Each presentation must be researched from at least one recommended source, e.g., sciencenow.sciencemag.org, eurekalert.org, sciencenews.org, sciencedaily.com, science.nasa.gov, economist.com, nytimes.com/pages/science, aip.org, physorg.com, or pubs.acs.org/cen. There will be a strict time interval of 4 to 5 minutes for these presentations. If any computer visual aids are required, then you will need to upload them into LON-CAPA the night before.</p> <p>It is challenging to present a clear, concise, and compelling presentation, particularly on a science/technology issue. The opportunity to give multiple presentations will help students hone their critical thinking and presentation skills. If you wish to gain additional experience with giving talks outside class, then you may want to consider visiting the VCU Toastmasters Club (www.vcutoastmasters.com). This club is part of an international society dedicated to improving the speaking and leadership skills of its members. It meets every Wednesday at 12:05 – 12:55 pm in Engineering West, Rm. 252. (Take the left hallway from the main entrance & turn right at the end of the hallway to enter the double doors.)</p> |
| <p>Journal 15 %</p> <p>Due Sun by 11pm</p> | <p>You will write a weekly journal to reflect on the material discussed in class. Journal entries are due in LON-CAPA on Sundays by 11 pm. Details of logging in to LON-CAPA at loncapa.vcu.edu and how to use the system are available in Bb and will be discussed in class. There will be no late or excused journal entries. Each entry should clearly label and discuss the topics for each day of class. You can also briefly discuss the daily student presentations, but this discussion will count no more than 150 of the 400 required words. If you are not present for a given day of class, then explicitly state so. Each week’s journal must be a minimum of 400 words and is graded for completeness on a 10-point scale.</p> |
| <p>Homework 20 %</p> <p>Due Tue by 11pm</p> | <p>This course will also use LON-CAPA for weekly homework assignments that include multiple-choice, numerical answer, and short-answers relevant to class topics. You will also briefly write about a current science or technology topic each week. These assignments are due on Tuesdays by 11 pm. There will be no late or excused homework assignments. Problems given on quizzes and the final exam will be very similar to those appearing on homework assignments.</p> <p>Each homework problem will usually have a limited number of “tries” available in order to obtain the correct answer. It is highly recommended that you first try all of the assigned problems in the practice directory before completing the actual assignment. Due to the randomization coded into these problems, the versions in the practice directory may be slightly different than the version in your personalized assignment, but the concepts will be the same. If you are having difficulties with a problem, then you can post an online question. Instructors will monitor these questions up to 6 hr before the deadline.</p> |
| <p>Quizzes 20 %</p> <p>Due Sun by 11pm</p> | <p>LON-CAPA quizzes based on previous homework assignments will be given as per the schedule. The quiz will be open from Friday at 9 am to Sunday at 11 pm. At any time during this period, you can begin the quiz and you will have 1 hour from the start time to complete it. (Note: If you begin the quiz on Sunday at 10:30 pm, then there will only be 30 minutes remaining!) There will be no late or excused quizzes.</p> |

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| | Each multiple-choice or numerical quiz problem will have two tries , but only half credit will be given if the correct answer is provided on the second try . These quizzes will be open-notes, so it is recommended that you keep your work from previous homework assignments. These quizzes are <u>honor pledged</u> , i.e., you are to neither give nor receive aid while completing them on-line. |
| Final Exam 20 % | The online, open-notes final exam will consist of standard LON-CAPA questions from homework assignments and additional essay questions. Each standard problem will have two tries, but half credit will be given if the correct answer is provided on the second try. When logged in to take the final exam, you are required to complete the questions without the aid of other students, i.e., it is an <u>honor-pledged</u> assignment. In addition, all essay questions are to be answered <i>strictly</i> in your <i>own</i> words. The final exam will be open online from Apr 30 (Thur) to May 6 (Wed) and you will have a maximum of 3-1/2 hours from the start time to complete it. |
| VCU Honor System | Students should familiarize themselves with the VCU Honor System documentation at: www.provost.vcu.edu/pdfs/Honor_system_policy.pdf . Convincing evidence of honor system violations will result in the submission of formal written charges to the Office of Judicial Affairs & Academic Integrity. Please note that an honor system sanction resulting in a course grade of 'F' cannot be voided by course withdrawal, repeat course option, or grade appeal. A transcript notation is also recorded for such a grade sanction. |
| Accommodations for the Disabled | The Americans with Disabilities Act of 1990 requires VCU to provide an "academic adjustment" and/or a "reasonable accommodation" to any individual who advises us of a physical or mental disability. If you have a disability that requires an academic adjustment or accommodation, please <u>arrange a meeting</u> with your instructor as soon as possible and <u>no later than January 29</u> . Please contact the appropriate Coordinator of Service for Students with Disabilities to obtain an official memo detailing the academic adjustments or accommodations which you need, and provide a <u>copy of the memo</u> to your instructor <u>by January 29</u> . |
| Student Conduct | Students should familiarize themselves with the guidelines for appropriate student conduct as outlined in the VCU Insider Student Handbook and Resource Guide located at http://www.students.vcu.edu/rg/docs/rules_procedures.pdf . During class it is expected that inappropriate electronic devices (cell phones, pagers, ipods, etc.) are turned off. |
| What to Know and Do to Be Prepared for Emergencies at VCU | <ol style="list-style-type: none"> 1. Sign up to receive VCU text messaging alerts (http://www.vcu.edu/alert/notify). Keep your information up-to-date. 2. Know the safe evacuation route from each of your classrooms. Emergency evacuation routes are posted in on-campus classrooms. 3. Listen for and follow instructions from VCU or other designated authorities. 4. Know where to go for additional emergency information (http://www.vcu.edu/alert). 5. Know the emergency phone number for the VCU Police (828-1234). Report suspicious activities and objects. |

Spring 2009 Schedule for PHYS 215: Science, Technology, and Society

| | TUESDAY Homework due by 11 pm | | THURSDAY | | SUNDAY Due by 11 pm |
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| 1/13 A1 | 1: Introductory Concepts | 1/15 A2 | 1: Introductory Concepts | 1/18 | Journal #1 |
| 1/20 A3 | 1 & 2: Electromagnetic Spectrum HW #1 due | 1/22 A4 | 2: Electromagnetic Spectrum | 1/25 | Journal #2 |
| 1/27 A5 | 2: Electromagnetic Spectrum HW #2 due | 1/29 A6 | 2: Electromagnetic Spectrum | 2/1 | Journal #3 Quiz #1 |
| 2/3 A7 | 2: Electromagnetic Spectrum HW #3 due | 2/5 A8 | 2: Electromagnetic Spectrum | 2/8 | Journal #4 |
| 2/10 A9 | 2: Electromagnetic Spectrum HW #4 due | 2/12 A10 | 2: Electromagnetic Spectrum | 2/15 | Journal #5 Quiz #2 |
| 2/17 A11 | 3: Power of the Nucleus HW #5 due | 2/19 A12 | 3: Power of the Nucleus | 2/22 | Journal #6 |
| 2/24 A13 | 3: Power of the Nucleus HW #6 due | 2/26 A14 | 3: Power of the Nucleus | 3/1 | Journal #7 Quiz #3 |
| 3/3 A15 | 3: Power of the Nucleus HW #7 due | 3/5 A16 | 3: Power of the Nucleus | 3/8 | Journal #8 |
| 3/10 | NO CLASS Spring Break | 3/12 | NO CLASS Spring Break | 3/15 | |
| 3/17 A17 | 4: Quantum World & Nanoscience HW #8 due | 3/19 A18 | 4: Quantum World & Nanoscience | 3/22 | Journal #9 Quiz #4 |
| 3/24 A19 | 4: Quantum World & Nanoscience HW #9 due | 3/26 A20 | 4: Quantum World & Nanoscience | 3/29 | Journal #10 W-Day |
| 3/31 A21 | 4: Quantum World & Nanoscience HW #10 due | 4/2 A22 | 4: Quantum World & Nanoscience | 4/5 | Journal #11 Quiz #5 |
| 4/7 A23 | 4: Quantum World & Nanoscience HW #11 due | 4/9 A24 | 4: Quantum World & Nanoscience | 4/12 | Journal #12 |
| 4/14 A25 | 5: Semiconductors & Devices HW #12 due | 4/16 A26 | 5: Semiconductors & Devices | 4/19 | Journal #13 Quiz #6 |
| 4/21 A27 | 5: Semiconductors & Devices HW #13 due | 4/23 | 5: Semiconductors & Devices | 4/26 | Journal #14 |
| 4/28 A28 | 5: Semiconductors & Devices HW #14 due | 4/30 A29 | NO CLASS | 5/3 | Quiz #7 |