

## SCHEDULE FOR PHYS 1111-05 – SCIENCE, POLITICS AND ECONOMIC GROWTH – FALL 2020

| <i>Day</i>  | <i>Date</i> | <i>Theme for reports and discussions</i>                         | <i>Reading before class</i> | <i>Assigned papers</i> |
|---|-------------|--|-----------------------------|------------------------|
| <b>UNIT 1: BUILDING A PROBLEM-SOLVING VOCABULARY FROM THE HISTORICAL RECORD</b>       |             |  |                             |                        |
| <b>1</b> T  | 25 Aug      | What's the problem, and who are the stakeholders?                | Brightspace files, GJ-Ch. 1 |                        |
| R   | 27 Aug      | How did we get here, or "Science: The Endless Frontier"          | GJ-Chs. 2-3, ML-Ch. 6       | Workshop #1*           |
| <b>2</b> T  | 1 Sept      | Basic/applied/engineering R&D: Pasteur's Quadrant.               | Brightspace files           | Essay #1 due           |
| R   | 3 Sept      | Who pays for research, and what does it cost to play?            | MM-Chs. 3-5, HN-Ch. 5       | Workshop #2            |
| <b>3</b> T  | 8 Sept      | The rise and fall of industrial basic research in America        | GJ-Ch. 4. ML-Chs. 6-7       | Essay #2 due           |
| R   | 10 Sept     | A very special case: AT&T Bell Laboratories                      | Brightspace files           |                        |
| <b>UNIT 2: LESSONS ON SCIENCE, TECHNOLOGY AND ECONOMIC GROWTH SINCE 1945</b>          |             |  |                             |                        |
| <b>4</b> T  | 15 Sept     | Grand-challenge problems and model technologies: lasers, again   | Brightspace files           |                        |
| R   | 17 Sept     | The pattern: GPS, smartphones, quantum dot TV, MRI               | Brightspace files           | Workshop #3            |
| <b>5</b> T  | 22 Sept     | How Wall Street sets limits on private investments in research   | GJ-Ch. 4                    | Essay #3 due           |
| R   | 24 Sept     | The role of patient capital in funding basic research            | MM Chs. 1-2, GJ Ch. 5       |                        |
| <b>6</b> T  | 29 Sept     | Big Science vs Little Science: so much time, so little money     | HN-Chs. 6, 12-13            | Essay #3.1 due         |
| R   | 1 Oct       | How much can Federal and state government invest in research?    | Brightspace files           |                        |
| <b>7</b> T  | 6 Oct       | Attempts to double the science agency budgets: 1992 and 2020     | ML, Chs. 9-10               | Workshop #4            |
| <b>UNIT 3: HOW SCIENCE, POLITICS AND POLICY CAN INTERACT TO DRIVE ECONOMIC GROWTH</b> |             |  |                             |                        |
| R   | 8 Oct       | Interlude: Why and how do we trust scientists? Should we?        | HD-Chs. 1-2, 7. Files.      | Essay #4.0 due         |
| <b>8</b> T  | 13 Oct      | Who makes science policy for the United States, and how?         | HN-Chs. 1-4, ML Ch. 10      | Workshop #5            |
| R   | 15 Oct      | Science for national security: Department of Defense             | HN-Ch. 11                   | Essay #4.1 due         |
| <b>9</b> T  | 20 Oct      | Science and industry: National Science Foundation and NIST       | HN-Chs. 13, 15              |                        |
| R   | 22 Oct      | Department of Energy: climate change and nuclear security        | HN-Chs. 7-8, MM Ch. 7       |                        |
| <b>10</b> T   | 27 Oct      | National Institutes of Health and the threat of global pandemics | HN-Ch. 14                   |                        |
| R   | 29 Oct      | Megaprojects and economic growth: NASA and CERN                  | HN Ch. 13. GJ, Ch.          | Essay #5.0 due         |

**UNIT 4: GLOBAL MODELS FOR SCIENCE POLICY: UNITED STATES, GERMANY AND CHINA**

|   |   |        |   |                            |                |
|---|---|--------|---|----------------------------|----------------|
| <b>11</b>   | T | 3 Nov  | Thriving technology? Social media, politics and economics                   | MIT and Stanford files     |                |
| R   |   | 5 Nov  | German science policy: Max Planck and Fraunhofer Institutes                 | Brightspace files: Germany | Essay #5.1 due |
| <b>12</b>   | T | 10 Nov | The rise of science and technology in China in the 21 <sup>st</sup> century | Brightspace files: China   |                |
| R   |   | 12 Nov | Could innovation happen at the margins? Greenville, SC <i>etc.</i>          | GJ, Ch. 6                  | Workshop #6    |
| <b>13</b>   | T | 17 Nov | Who will do science and technology: Diversity, equity, inclusion            | HN-Chs. 15-16              | Outline due    |
| R   |   | 19 Nov | Should the public reap a return from its investment in research?            | MM-Chs. 8-9, GJ-Ch. 7      | Essay #6.0 due |
| END OF ON-CAMPUS CLASSES AND THANKSGIVING BREAK, NOVEMBER 21-30 |   |        |   |                            |                |
| <b>14</b>   | T | 1 Dec  | Debate: Can basic research drive high economic growth rates?                | RG, Chs. 17-18             | Essay #6.1 opt |
| R   |   | 3 Dec  | Closing arguments: The case for public investments in science               | ML, Ch. 12,                | Conferences    |
| F   |   | 11 Dec | <i>Asynchronous term paper discussions possible 4-10 December</i>           |                            | Term Paper due |

\*ASSIGNED READING FOR IN-CLASS WRITING WORKSHOPS

|   |  |         |  |                     |  |
|---|--|---------|--|---------------------|--|
| R |  | 27 Aug  | Writing as transaction: Simplicity vs clutter                  | WZ, Chapters 1-3    |  |
| R |  | 3 Sept  | Your own voice: Style, audience, words and usage               | WZ, Chapters 4-7    |  |
| R |  | 17 Sept | Thematic unity, the lead and the ending                        | WZ, Chapters 8-9    |  |
| R |  | 1 Oct   | The academic paper: scale, scope, citations and search engines | Brightspace files   |  |
| R |  | 8 Oct   | When you write about science                                   | WZ, Chapters 11, 15 |  |
| R |  | 5 Nov   | Dealing with the final product                                 | WZ, Chapters 20-22  |  |

**KEY TO READING ASSIGNMENTS**

|  |   |
|--|---|
| <b>GJ</b> = Jonathan Gruber and Simon Johnson, <b>Jump-Starting America</b>        | <b>HN</b> = Homer Neal, <b>Beyond Sputnik: U. S. Science Policy</b> (reserve) |
| <b>ML</b> = Michael Lubell, <b>Navigating the Maze</b> (reserve)                   | <b>JZ</b> = John Ziman, <b>Prometheus Bound</b> (reserve)                     |
| <b>MM</b> = Mariana Mazzucato, <b>The Entrepreneurial State</b>                    | <b>RJ</b> = Robert Gordon, <b>Rise and Fall of American Growth</b> (reserve)  |
| <b>HD</b> = Heather Douglas, <b>Science, Policy &amp; Value Free ...</b> (reserve) | <b>WZ</b> = William Zinsser, <b>On Writing Well</b>                           |