CAS NS291: INTRODUCTION TO SCIENTIFIC RESEARCH

Boston University Dresden Science Program

SYLLABUS AND GUIDELINES

Course Designator:	**CAS NS291**
Title:	**Introduction to Scientific Research**
Time:	**Wednesdays 6:00 p.m. to 7:30 p.m. (on 10/15 2:00 to 3:30 p.m.)**
Place:	**MTZ, Dpmt. of Physiology, room D 20.016**
Lab Visits:	**Wednesday, October 22 to December 10, 1:30 p.m. to 5:30 p.m. according to appointments**
Student presentations:	**Wednesday, December 17, 2014, 9 a.m MTZ seminar room 4/5**
Final Wrap Up meeting	**Wednesday, December 10, 2014**

Course Description

Prerequisite: one year of a laboratory science course. For students enrolled in Boston University science study abroad programs and full time students of TU Dresden. This course is an introduction to the performance of scientific research through lectures, discussions, and readings about the design of projects, the understanding of the scientific literature, and the ethics of research and publication. Local science faculty members will describe their research projects, and welcome students into their laboratories during lab visits. Students will choose a research topic and practice abstract writing, poster preparation and oral presentation of chosen topic. In addition, students will obtain first experience as review peers.
Language of Instruction: English, 2 credits.

Basis of the Syllabus

- Approximately 8 weeks of weekly 90 to 120-minute class meetings with the course instructors and visiting faculty to explore library-based and electronic scientific literature, the approach to the design and execution of a research project, and the ethics of research and publication, including the examination of case studies.
- Attendance of lab visits of local faculty.
- At least one paper (approximately 1,000 words in length) during the semester on issues raised in readings, discussions, and lectures.
- Final written report (approximately 1,000 words in length) about the research lab visits and a short (~15 min.) oral or poster presentation at an open research session.

Sources for Selected Readings and Discussions

- "Scientific Integrity: Text and Cases in Responsible Conduct of Research," F.L. Macrina, ASM Press, 2005. (ISBN-13: 978-1555813185)
- "An Introduction to Scientific Research," E.B. Wilson, Jr., Dover Publications, 1991. (ISBN-13**:** 978-0841209336)
- "Writing the Laboratory Notebook," H.M. Kanare, American Chemical Society, 1985. (ISBN-13: 978-0841209336)
- and other texts provided by the course instructors

Grade Assessment

- 20% based on attendance at the course sessions and participation in discussions as assessed by the course instructors.
- 30% based on assigned papers during the semester as assessed by the course instructors.
- 50% based on the quality of the research performance, the final written report, and oral/poster presentation as assessed by the research supervisor and course instructors.

Admission into the Course

Students who are interested in taking NS291 will submit a short questionnaire to the Director, which will indicate his/her past experience in independent work (science fare projects, summer research activities, etc.), possible future research directions.

Applicants will be interviewed by the course instructor to be sure that they understand the commitments of time and effort of this optional elective course.

Practical Research Experience

During the first class session students will receive the schedule for the laboratory visits. It is expected that students participate in all visits. Students will prepare a short written report about these laboratory visits. This may be done as an overview of the different visits or as a report on a specific visit (see below).

Students will select a scientific area or project of interest. During the course students will prepare an oral presentation (5 min), write an abstract and prepare a poster on the topic and learn how to document experiments. Also, an introductory experience in a peer review process will be offered.

At the end of the semester, the student will submit a final written report (~1,000 words in length) about the research visits, and a short (~10 min.) oral or poster presentation at an open session.

Syllabus

Week	Dates, Fall 2014	Topics	Instructors
1	10/15 2:00-3:30 p.m., library, Physiology	Course introduction, course expectations What is science? Structuring research (hypothesis, project documentation, publishing, research resources, ethical issues), General structure of scientific communications Indexing literature, citing literature, copy rights, ethical issues Theory, discussion	Deussen, Härtel, Parshyna
2	10/22 6:00-7:30 p.m., library Physiology	Documentation, keeping a lab book Structure of scientific communications, data, figures, tables Theory & practical examples Finding a research topic Theory Home work: find your own topic of interest and prepare a short presentation	Härtel, Parshyna
3	11/05 6:00-7:30 p.m. library Physiology	Presenting the research topic Presentation by each student, group work, wrap-up	Dieterich, Kopaliani
4	11/12 6:00-7:30 p.m. library Physiology	Theory: structure of scientific abstracts, abstract presentations and publications Home work: writing an abstract for your research topic	Dieterich, Kopaliani
5	11/26 6:00-7:30 p.m. library Physiology	Abstract, reading & evaluation of written abstracts Peer review by group, wrap-up and discussion	Dieterich, Kopaliani
6	12/03 6:00-7:30 p.m. library Physiology	Theory: structure of scientific posters, poster presentation Home work: preparing a poster	Dieterich, Kopaliani
7	12/10 6:00 -7:30 p.m. library Physiology	Presenting the poster (presentation by each student) Peer review by group, group work Course wrap up, open questions	Dieterich, Kopaliani, Deussen
8	12/17 9:00 a.m.-1:00 p.m., SR 4/5 MTZ	Final presentations by students, poster discussion (course assessment)	Deussen, Dieterich, Härtel, Kopaliani, Parshyna
9	10/22 to 12/10	Visits of various Research Labs	T.B.A.