



FACULTY OF ENGINEERING

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

BINF4920

PROFESSIONAL ISSUES AND ETHICS IN BIOINFORMATICS

SESSION 1, 2011

Course staff

Course Convener:

Bruno Gaëta (BG) – bgaeta@unsw.edu.au (best contacted through the online course forum and by email)

Lecturers:

Adrienne Torda (AT) – Faculty of Medicine

Will Rifkin (WR) – ALTC New Media for Science Project

Course details

This course is worth 3 units of credit and involves tutorials and workshops held some Wednesdays 11-1 in Goldstein G01, as well as attendance to selected lectures from SENG4921 (Professional Issues and Ethics in Software Engineering) and BABS3071 (Commercial Biotechnology).

Provisional details are provided in the course schedule below and will be updated on the course web site (<http://www.cse.unsw.edu.au/~bi4920>)

SENG4921 lectures are held Wed 11-1 in Webster A

BABS3071 lectures are held Wed 11-1 in Biomed F

A large part of the course involves discussion of the classes on the course website (accessible through <http://www.cse.unsw.edu.au/~bi4920>)

Course aims

Bioinformatics professionals are often called to work at the interface between computational and biological sciences, using technologies and communicating with experts from both fields. In industry, bioinformatics overlaps with the information technology and biotechnology sectors, both relatively new and rapidly evolving “knowledge-based industries” with a potentially considerable impact on society. The course aims are:

- To introduce key topics shaping the development of bioinformatics as a discipline, including commercialisation of innovations and intellectual property in biotechnology and software industries
- To encourage reflection on the ethical concerns that affect the practice of bioinformatics both as a life science and an engineering discipline
- To develop a number of professional skills including cross-discipline communication, teamwork, and job search and interview skills

BINF4920 focuses on the professional practice and social, commercial and legal context of bioinformatics rather than on its scientific and technological bases that are emphasised in other courses in the program.

Student learning outcomes

- Discuss the factors that affect biotechnology and computer industries (especially at the start-up stage) such as intellectual property and funding
- Develop an awareness of various views of ethical issues (including engineering ethics and bioethics) and a framework for reflecting on these issues.
- Improve presentation, job search and interview skills

- Develop an awareness of communication issues, especially between people with different educational backgrounds (biology, computer science, IT, business).

The UNSW Graduate Attributes developed as part of this course include:

- *An in-depth engagement with the relevant disciplinary knowledge in its interdisciplinary context* – addressed through lectures, workshops and tutorials, and especially the stockmarket game assignment
- *The capacity for analytical and critical thinking and for creative problem-solving* – addressed through interactive workshops and through the online summary and reflection that require students to analyse and discuss lecture and workshop contents
- *The ability to engage in independent and reflective learning* – addressed through participation and the reflection and summary exercises
- *The capacity for enterprise, initiative and creativity* – the communication workshop and the bioethics assignment in particular require students to exercise initiative and creativity, while the stockmarket game assignment requires enterprise and initiative
- *An appreciation of, and respect for, diversity* – this is explored especially through the ethics and bioethics content of the course, which require students to explore multiple viewpoints
- *The skills required for collaborative and multidisciplinary work* – the stockmarket and bioethics assignments are carried out in groups and require student collaboration
- *An appreciation of, and a responsiveness to, change* – this is addressed in several sections of the course but especially emphasized as part of the stockmarket assignment
- *A respect for ethical practice and social responsibility* – ethics and bioethics are a major component of this course and are explored through lectures, tutorials, workshops and assignments
- *The skills of effective communication* – communication skills are explicitly studied in the communication skills and job skills workshops and applied throughout the assessed components of the course, which involve written communication (summaries and reflection, stockmarket game) and oral presentation (bioethics presentations, communication assignment, class participation).

The rationale behind your approach to learning and teaching

Participation, interaction and reflection are strongly emphasised over content memorisation. The course engages the students through activities and interactive workshops and uses both in-class and online posting to encourage reflection on the various topics.

Teaching strategies

- Guest lectures from experts from biotechnology, IT and medical backgrounds introduce the fundamental concepts in the various topics (ethics, intellectual property, communication)
- Interactive workshops and tutorials encourage the students to reflect on, develop, communicate and argue their personal point of view on the topics
- Half the assessment for the course involves group work and team exercises, echoing the collaborative nature of bioinformatics work.

Assessment

Stock market game (or alternative assignment): 25%

Bioethics presentations: 35%

Class summaries and reflection: 35%

Other exercises: 5%

There is no examination in this course.

Stock market game (25%):

The goal of this exercise is to familiarise yourself with the stock market, especially in high-tech areas such as IT and biotechnology and to practice teamwork skills. Starting in week 1 you will work as teams to research companies and build a virtual portfolio on NASDAQ including shares in IT, biotech and bioinformatics companies. Each team is expected to hand in a report in week 11 describing each stock you purchased, its performance, your reasons for purchasing and selling. Marks will be awarded based on the performance of your portfolio, but mostly on the reasoning and research used to justify your buy/sell decisions.

Note that a very similar assignment is given in BABS3071 Commercial Biotechnology. Students who have already done BIOT3071/BABS3071 or are currently enrolled in BABS3071 will be spread across all the teams to keep all the teams on a level-playing field. If this cannot be achieved, students doing BABS3071 will be given an additional assessment task.

Bioethics presentations (35%):

The aims of this exercise are to explore in depth a bioethics issue, and practice teamwork and presentation skills.

Early in session you will be asked to form teams (note: different teams than for the stock market game) and choose a bioethics issue of interest to you. Later in the session teams will present their issue to the rest of the class in 20 minutes. Presentations can involve debates, roleplays, mock court cases, AV presentations etc (your choice). Presentations will be assessed on content (whether the ethical aspects of the chosen issue are adequately covered), presentation (originality, clarity and entertainment value) and engagement of the rest of the class. This mark will include a peer assessment component.

Class summaries and reflection (35%):

Since this course has no final exam, you are expected to attend every lecture and tutorial, and submit each a short (about 1 page max) summary each of these classes describing the main message you got from the class, your own opinion on various issues discussed in the class (and a justification for this opinion) and other thoughts resulting from reflection on the topic of the class.

Other exercises (5%)

This mark is for some small homework and presentation tasks over the course of the session.

Provisional course schedule

Note that this schedule is subject to change and additions as a number of guest lectures have not been confirmed yet. Updates and additions to this schedule will be posted on the course website and announced by email.

Wk	Wed 11-1 Goldstein G01	Wed 11-1 Biomed F (BABS3071)	Wed 11-1 Webster A (SENG4921)
1	<i>No lecture</i>		
2			Ethics 1 (Stephen Cohen)
3	Bioethics (AT)		
4	Diffusion of Innovation (WR)		
5		Australian Biotech	
6	Attitudes and professionalism (BG)		
7	Communication (WR)		
8		GMOs 1 (James Nielsen)	
9		GMOs 2 (Paul Adam)	
10	Bioethics presentations (AT, BG)		
11	Employment conditions (APESMA)		
12			(To be confirmed)
13	Job skills (Mita Das, Careers Unit)		

Resources for students

There is no textbook for this course. Readings and discussion boards will be made available on the course website (accessible through <http://www.cse.unsw.edu.au/~bi4920/>). The enrolment key for the course is CROCODILES.

Course evaluation and development

- Feedback on the course is gathered throughout session through the online discussion groups, as well as through the Course and Teaching Evaluation and Improvement (CATEI) surveys at the end of session.
- Feedback from 2009 indicated that the class summary and reflection and the online forum overlapped too much, and that the assignments were too stacked towards the end. In 2010 the online forum assignment has been removed (with other assessment weight increased to compensate) and in 2011 the time between the bioethics lecture and the bioethics assignment was increased to allow more time for presentation preparation.

Academic honesty and plagiarism

What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own.* Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

www.lc.unsw.edu.au/plagiarism

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

Other matters

- Occupational Health and Safety: students are reminded of the university's OHS policies and recommendations, which are accessible at www.riskman.unsw.edu.au/ohs/ohs.shtml
Information specific to OHS in the school of CSE, and especially of ergonomics issues related to use of computers can be accessed at <http://www.cse.unsw.edu.au/~ohs/>
- Equity and diversity: note that students who have a disability that requires some adjustment in their learning and teaching environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of the course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734). Information for students with disabilities is available at: www.equity.unsw.edu.au/disabil.html