INFO90001 eHealth & Biomedical Informatics Methods

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2014.
Time Commitment:	Contact Hours: 36 hours Total Time Commitment: 200 hours
Prerequisites:	**Subject** | **Study Period Commencement:** | **Credit Points:** ISYS90069 eHealth & Biomedical Informatics Systems | June | 12.50
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Contact:	email: **kgray@unimelb.edu.au (mailto:kgray@unimelb.edu.au)**
Subject Overview:	**Aims** This subject familiarises students with core informatics tools and methods used in eHealth, translational research, simulation and modelling, and biomedical knowledge management. It also provides students with insights into research trends in the field of biomedical informatics. **Indicative Content** Five major topics will be covered in lectures, tutorials and hands-on computer labs: 1. How can we manage clinical data? Students will gain exposure to: informatics tools and methods for ehealth and broadband-enabled health, including shareable medical records, telehealth, mobile health; terminologies, coding and standards e.g. SNOMED-CT, HL7A and secure messaging, medical imaging (DICOM) and lab data (LOINC); and clinical decision support systems. 2. How can we integrate clinical data with molecular, population, environmental and other data sources? Students will gain exposure to: informatics tools and methods for translational research, including genomic data sources (microarray and next generation DNA sequencing); data integration and analysis platforms such as BioGrid, CaBIG. Gene ontology; and clinical research informatics (clinical trials). 3. How can we use computer models to simulate human biology and disease? Students will gain exposure to: informatics tools and methods for simulation and modelling; anatomical ontologies (FMA); VPH and Physiome platform; and infodemiology tools, systems medicine, virtual environments for clinical practice. 4. How can we manage health and biomedical knowledge? Students will gain exposure to: informatics tools and methods for biomedical informatics research, including bibliographic and web information; MeSH, and databases; biomedical text mining; social and semantic web for health and life sciences; technology assessment; and systematic reviews and meta-analyses.

	5. How can we develop the next generation of health and bioinformatics tools and methods? Students will gain exposure to trends and advances, including extreme phenotyping, informatics for personalised, regenerative and nanomedicine.
Learning Outcomes:	**Intended Learning Outcomes (ILO)** On completion of this subject the student is expected to: 1 Describe key informatics tools and methods used in eHealth, translational research, simulation and modelling, health and biomedical knowledge management 2 Map typical needs in eHealth, translational research, simulation and modelling, health and biomedical knowledge management onto specific informatics tools and methods 3 Demonstrate an understanding of how clinical data is integrated with molecular, population, environmental and other data sources 4 Demonstrate an understanding of how computer models simulate human biology and disease, through a variety of informatics tools and methods for simulation and modelling 5 Work knowledgeably towards resolution of research challenges in the field of biomedical informatics.
Assessment:	50%: Five written reports based on individual computer-based learning tutorials / practical activities done in class, around 500 words each (2500 words total), submitted weekly. Addresses Intended Learning Outcomes (ILO's) 1, 2, 3 & 4. 50%: Project report (2000 words) on a comparative study of two or more specific EHBI tools, or two or more specific EHBI methods, exact focus as negotiated with teaching staff. 10 minute presentation for class peer review in the last week of classes. Group projects are optional. Each member will get the same mark. 1000 additional words and 5 additional minutes of class presentation are required for each extra person, i.e. 2 people = 3000 words + 15-minute presentation; 3 people = 4000 words + 20-minute presentation, etc. Addresses ILO's 5 and also 1, 2, 3, or 4 (depending on topic).
Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject, students should have developed the following generic skills: # Clear thinking # Improved reading # Enhanced ability to work in a team of people, and # Presentation skills
Notes:	**Learning and Teaching Methods** This subject is offered in intensive mode, with 6-8 hours of class each week over a five week period, including lectures and small group activities. Opportunities are provided for online interaction during class using students' personal internet-connected devices. Subject documents and class records are handled using LMS Blackboard. **Indicative Key Learning Resources** This subject has no textbook. Students have access to lecture audio and slides in the LMS, as well as electronic full-text of recommended readings, including current journal articles, government documents and industry reports. 2012 examples of recommended readings are: Hunter, Peter, Coveney, Peter V., de Bono, Bernard et al 2010 **A vision and strategy for the virtual physiological human in 2010 and beyond (http://dtl.unimelb.edu.au/R/BKM78HX9MHP63GM9764HI8GCGBNVAJKK26SGD8UDKYDLRVNY9A-01263?func=results-jump-full&set_entry=000004&set_number=000740&base=GEN01)** Kharraz, Hadi, Chisholm, Robin, Van Nasdale, Dean and Thompson, Benjamin 2012 **Mobile personal health records: an evaluation of features and functionality (http://dtl.unimelb.edu.au/R/BKM78HX9MHP63GM9764HI8GCGBNVAJKK26SGD8UDKYDLRVNY9A-01327?func=results-jump-full&set_entry=000020&set_number=000740&base=GEN01)**

	Lobach, David, Sanders, Gillian D., Bright, Tiffani J. et al 2012 **Enabling health care decision making through clinical decision support and knowledge management (http://dtl.unimelb.edu.au/R/BKM78HX9MHP63GM9764HI8GCGBNVAJKK26SGD8UDKYDLRVNY9A-01291?func=results-jump-full&set_entry=000011&set_number=000740&base=GEN01)** Louie, Brenton, Mork, Peter, Martin-Sanchez, Fernando, Halevy, Alon and Tarczy-Hornoch, Peter 2007 **Methodological review: data integration and genomic medicine (http://dtl.unimelb.edu.au/R/BKM78HX9MHP63GM9764HI8GCGBNVAJKK26SGD8UDKYDLRVNY9A-01323?func=results-jump-full&set_entry=000019&set_number=000740&base=GEN01)** **Careers/Industry Links** This subject is important in the field of eHealth and biomedical informatics, i.e. work that concerns the acquisition, storage, retrieval and use of information in, about and for human health, and the design and management of related solutions to advance the understanding and practice of healthcare. This subject is offered jointly by the Faculty of Engineering and the Faculty of Medicine, Dentistry and Health Sciences, and also uses expert guest speakers from industry and government.
Related Course(s):	Master of Information Technology Master of Information Technology