EDEM626-14S1 (D)
Computer Science for secondary schools

Description

This course will prepare participants to teach the computer science topics in the Digital Technologies achievement standards that were phased in from 2011 to 2013. Each of the main topics will be covered for both pedagogical and subject knowledge. A key component is an individual project to develop and assess a resource that would support teaching a topic from one of the standards, providing practical experience with an action research project that informs teaching for these new topics. This course does *not* cover computer programming.

Details of learning outcomes, assessment, due dates, contacts and so on are available from the course information system:

http://www.canterbury.ac.nz/courseinfo/GetCourseDetails.aspx?course=EDEM626&occurrence=14S1(D)&year=2014

Schedule

The planned schedule for the course is below. The dates for 2014 are firm, although the order of the topics covered will be adjusted to suit the needs of the class members.

Note that this is a 30-credit course, so there is a nominal total study time of 300 hours (including reading, lectures and assessment). Some of this time will overlap with using the topics in your teaching practice.

There will be about a 2-hour lecture each week on Tuesdays, 4 to 6pm (available live on-line and recorded). Students will be expected to do work in preparation for the lectures as well as follow-up work. Participation in lecture discussions is expected, but we appreciate that teachers may need to miss the occasional lecture for other commitments.

In addition, there is a compulsory one-day on-campus meeting near the start of the course.

Prior to course: you should select a topic from one of the CS standards that you will evaluate resource(s) for. Ideally it will be a topic that you are teaching in class. Please contact tim.bell@canterbury.ac.nz if you need help with this. Preparing this prior to the course will reduce the pressure later.

18 Feb: Pre-course *online* meeting – informal (a chance to check your video-conference setup and share initial thoughts about your main project; the order of topics will be adjusted to prioritise topics that you

are likely to use in your school, so if you can't attend this meeting you should discuss your topic with the course lecturer instead, and also test the video conference setup.)

25 Feb: Purpose of CS in schools; overview of CS topics in NCEA; resources available; review of socio-cultural theory for CS education

4 Mar: Algorithms

8 Mar (date is confirmed): SATURDAY BLOCK COURSE, 9am to 4pm, in Christchurch, Erskine building (cnr Science and Engineering Roads), room 315 (all students should attend on-site; not suitable for remote participation): Sharing the status in each student's school; introduction to the CS education literature; the roles of major organisations concerned with the curriculum development and teaching of computer science, including CSTA, NZACDITT, CAS, and ACM. This will be interspersed with activities to introduce the topics that teachers will be using in their class, including Unplugged activities that are easier to do in person than online.

11 Mar: HCI

18 Mar: Coding – cryptography, error correction and compression (note: this week and next are the university mid-semester break, but are during term-time for schools)

25 Mar: Formal languages.

1 Apr: Social and cultural issues including gender, diversity, disability and equity in computer science education.

8 Apr: Graphics and vision

15 Apr: informal Q&A session (university holidays, but lecturer available)

22 Apr: holidays

29 Apr: holidays

5 May: *due date for first* report

6 May: Programming languages

13 May: Complexity and tractability

20 May: Software Engineering, Network Protocols, Review

27 May: free

3 Jun: Class presentations

4 Jun: Class presentations (overflow date)

TBA (will be early to mid June): *due date for mini project (second report)*