PROPOSAL TO REVISE A GROUP OF COURSES

1. COURSE DETAILS

1.1 Course ID COMP1911,COMP1917,COMP1921,COMP1927,COMP2911

1.2 Course name - Long
COMP1911 Computing 1
COMP1917 Higher Computing 1
COMP1921 Computing 2
COMP1927 Higher Computing 2
COMP2911 Engineering Design in Computing

1.3 Course name - Abbreviated
COMP1911 Computing 1
COMP1917 Higher Computing 1
COMP1921 Computing 2
COMP1927 Higher Computing 2
COMP2911 Eng. Design in Computing

1.4 Course Authority Richard Buckland **ext/email** x56043/richardb@cse

1.5 Organisational Unit responsible for course
School: Computer Science and Engineering **AOU Code:** E250

1.6 Revision of Course Summary Checklist
Indicate the type of revision proposed:.

- To change the course name or number
- To amend the handbook description
- To vary pre-requisites or co-requisites

Name changes:

- COMP1921 Data Structures and Algorithms -> COMP1921 Computing 2
- COMP1927 Higher Data Structures and Algorithms -> COMP1927 Higher Computing 2
- COMP2911 Engineering Design 2 -> COMP2911 Engineering Design in Computing

Justification of Proposal

Experience in teaching COMP1911 and COMP1921 in 2006 and so far in 2007 has highlighted some problems brought about primarily by the wide variation in prior experience and expectations of students in these courses. Some students already have significant computing background, in particular experience with procedural programming; this was not such a problem when the first course was delivered via a functional language (Haskell). Some students intend to continue on to study significant amounts of computing; others are here primarily for “programming literacy” to assist in later courses.

In order to cater for this variation in student background/motivation, we have been

compelled to steer a middle ground on the level at which we pitch these courses. This has resulted in knowledegeable and/or highly-motivated students not achieving as much as they would have liked, and less knowledgeable and/or motivated students struggling with the material. This suggests that some form of streaming is required. We have decided to achieve this by implementing the Higher versions of the Computing 1 and Computing 2 courses that were approved as part of the development of the new first-year curriculum. At the same time, these course revisions implement the changes needed to deal with 12-week semesters.

The essence of the changes:

COMP1917 and COMP1927 are effectively the same as the existing COMP1911 and COMP1921 content-wise, but have a slightly higher prac work load than at present.

COMP1911 and COMP1921 drop some tangential topics (to fit within 12 weeks) and focus on the core programming material that is likely to be of most benefit to non-CSE majors in their future study.

All students taking CSE degrees will be encouraged to take COMP1917 and COMP1927. Other students may optionally take these if they believe they have a sufficiently strong programming background or are looking for a more challenging course.

Students who start with COMP1911 can automatically transition to COMP1927 if they score CR or better in COMP1911.

COMP1927 is the normal pre-requisite for COMP2911. Students who have completed COMP1921 may enrol in COMP2911 but should consult the course convenor to ensure that they understand what level of skill is required in the transition; the course convenor will then advise on additional self-study to bring them to the necessary level.

COMP2911 remains a pre-requisite for most higher level COMP courses. Some higher-level COMP courses are available to students with only a COMP1921 or COMP1927 background.

1.8 Consultation Process

The main stakeholders affected by this process are Electrical Engineering students. The proposal has significant benefits to them, but also potential minor disadvantages. For EET students who are not interested in pursuing substantial further study in computing, the new COMP1911/1921 stream gives them a better chance to obtain a solid grounding in C and machine-level programming skills, which is what EET has indicated they require for their students. On the other hand, EET students who are keen on computing are able to undertake the higher computing courses if they wish. Students who follow the COMP1911/1921 path are still able to pursue further computing studies (e.g. COMP2041, COMP3311, COMP3511, etc.) but with a more limited range of choices. If they wish to undertake computing studies with the full range of choices, they will be required to pass COMP2911. We have had extensive discussions with EET and they are satisfied with this proposal.

The above discussion applies equally to students from other engineering schools, who currently have COMP1911 as an option in their first year (as an alternative to ENGG1811). Such students would now have the option of studying either COMP1911/1927, depending on their motivation and background.

Details of Changes (via proposed handbook entries)

Handbook entries are given for:

- COMP1911 Computing 1
- COMP1927 Higher Computing 1
- COMP1921 Computing 2
- COMP1927 Higher Computing 2
- COMP2911 Engineering Design in Computing

COMP1911 Computing 1
UOC 6
HPW 6 (3hr lecture, 3hr tute/lab)
Offered S1, S2
Pre-reqs none
Description

Notes: *This course is suitable for students with an interest in learning programming in a standard procedural language, but who do not intend to undertake substantial further computing studies. Students intending to pursue studies in CSE courses beyond first-year are advised to take COMP1917 instead of COMP1911.*

The objective of this course is for students to develop proficiency in programming using a high level language. Topics covered include: fundamental programming concepts, program testing and debugging, the underlying memory representation of data, programming style. Practical experience of these topics is supplied by laboratory programming exercises and assignments. No prior computing background is required.

COMP1917 Higher Computing 1
UOC 6
HPW 7 (4hr lecture, 3hr tute/lab)
Offered S1, S2
Pre-reqs none
Description

Notes: *Students intending to pursue a career in computing, or with a greater degree of interest in computing, are advised to take this course rather than COMP1911.*

The objective of this course is for students to develop proficiency in programming using a high level language. Topics covered include: fundamental programming concepts, program testing and debugging, the underlying memory representation of data, programming style. Practical experience of these topics is supplied by laboratory programming exercises and assignments. No prior computing background is required. This course has a similar syllabus to COMP1911 but covers it in greater depth and with more practical work

COMP1921 Computing 2
UOC 6
HPW 7 (4hr lecture, 3hr tute/lab)
Offered S1, S2, X1
Pre-reqs COMP1911 or COMP1917
Description

Notes: *Students intending to pursue studies in CSE courses beyond first-year are advised to take COMP1927 rather than COMP1921. The first assignment will be released and students will be given material to study before the start of session*.

Data types and data structures: lists, trees, graphs; and associated algorithms. Programming assignments, laboratory exercises, formal examination. Preparation work is required before the course starts (see http://www.cse.unsw.edu.au/~cs1921/ for details).

COMP1927 Higher Computing 2
UOC 6
HPW 7 (4hr lecture, 3hr tute/lab)
Offered S2, X1
Pre-reqs COMP1917 or (COMP1911 with grade of CR or better)
Description

Notes: *Computing majors are strongly advised to take this course rather than COMP1921. The first assignment will be released and students will be given material to study before the start of session.*

Programming in the large, abstraction and ADTs, interfaces, complexity. Data types and data structures: lists, trees, graphs; and associated algorithms. Programming assignments, laboratory exercises, formal examination. Preparation work is required before the course starts (see http://www.cse.unsw.edu.au/~cs1927/ for details).

COMP2911 Engineering Design in Computing
UOC 6
HPW 7 (4hr lecture, 3hr tute/lab)
Offered S1, S2
Pre-reqs COMP1927 or COMP1921
Description

Notes: *Students who have completed COMP1921 are permitted to enrol in this course, but should be aware that it assumes a level of skill and background knowledge beyond that obtained by a simple pass in COMP1921. Any COMP1921 students proceeding to COMP2911 are strongly advised to consult with the course convenor to determine what additional self-study is necessary to prepare them for COMP2911.*

The engineering design and use of reliable and complex software systems. Object orientation and design. Problem-solving design methodologies: backtrack, greedy methods, divide and conquer, dynamic methods. Programming assignments, laboratory exercises, formal examination.

1.12 Is this course replacing an existing course?

Yes. This proposal describes new versions of COMP1911, COMP1917, COMP1921, COMP1927, COMP2911.

1.13 Undergraduate

1.14 Core / Elective (can be either, depending on program)

One of (COMP1917 or COMP1911) **and** one of (COMP1927 or COMP1921) **and** COMP2911 are core for all CSE majors (programs 3645,3647,3648, 3978 and all double-degrees

incorporating these programs). COMP1927 is strongly preferred for CSE majors.

One of (COMP1911 or COMP1917) **and** one of (COMP1921 or COMP1927) are core for EET majors
(programs 3640, 3643 and all double-degrees incorporating these programs)

1.15 Program stage

COMP1911, COMP1917 are taken in stage 1.
COMP1921, COMP1927 may be taken either in Stage 1 or Stage 2.
COMP2911 is taken in Stage 2.

1.16 Program/s in which course is be available

These courses are available in all programs offered through the Faculty of Engineering, and all double-degree programs that incorporate an Engineering program. They are also available as electives in all programs offered by the other Faculties at UNSW.

1.17 Proposed teaching methods and assessment practices

Teaching in all of these courses is carried out by a combination of lectures, tutorials and laboratory
classes. Practical assignments are a very important learning component of all of these courses. Assessment is based on work in laboratories and assignments, and on formal examinations.

1.18 Assessment grades to be used

Full range of grades (e.g. HD,DN,CR,PS,FL,…)

1.19 Mode of delivery: Internal

1.20 Information Technology Requirements for students

Information technology requirement is standard as for all other courses offered by the School of Computer Science and Engineering. We provide laboratories in which students can carry out all of their practical work. We also provide support for setting up an environment at home to work on their laboratory exercises and assignments.

1.21 Textbooks

COMP1911 and COMP1917

Recommended text:

Alistair Moffat, *Programming, Problem Solving, and Abstraction with C*, Pearson Educational, Australia, 2003, ISBN 1-74103-080-3.

Additional reference material:

Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language*, 2nd edition, Prentice Hall, 1988, ISBN 0-13-110370-9.

Jeri R. Hanly and Elliot B. Koffman, *Problem Solving and Program Design in C*, 4th edition, Addison Wesley, 2004, ISBN 0-321-21055-7.

H.M. Deitel, P.J. Deitel, *C How To Program*, 4th edition, Prentice Hall, 2004, ISBN 0-13-122543-X

A.S. Tanenbaum, *Structured Computer Organisation,* 4th edition, Prentice Hall, 1999. ISBN 0-13-0204358.

COMP1921 and COMP1927

Recommended text:

R.Sedgewick, *Algorithms in C, Parts 1-5*, 3rd edition, Addison-Wesley, 2002, ISBN 0201756080

Additional reference material:

A.Koenig, *C Traps and Pitfalls*, Addison-Wesley, 1989, ISBN 0201179288

COMP2911

Recommended text:

None.

Additional reference material:

Course notes and other resources will be made available to students via the course web site.

1.22 Industrial experience component

N/A

2. RESOURCE STATEMENT

2.1 Enrolments

Estimated or proposed enrolments for the next three years.

COMP1911 200/semester for all of 2008,2009,2010
COMP1917 200/semester for all of 2008,2009,2010
COMP1921 200/semester for all of 2008,2009,2010 (lower enrolment in summer)
COMP1927 200/semester for all of 2008,2009,2010 (lower enrolment in summer)
COMP2911 250/semester for all of 2008,2009,2010

2.2 Additional Resource Requirements Resulting from Revision

Staffing Requirements:

The additional resources come from CSE providing lecturing staff for COMP1917 and COMP1927, which have not run previously. Since the courses effectively result in a re-distribution of students over two courses (e.g. students who would have taken COMP1911 now have a choice between COMP1911 and COMP1917), the requirements for casual tutor/demonstrators are unchanged.

Hours per week for each of COMP1917 and COMP1927

3 Full-time Academic Staff

0 Part-time Teaching Staff

0 General Staff

Field Costs:	N/A
Studio/Laboratory Requirements:	N/A
Materials Requirements:	N/A
Equipment Costs:	Covered by normal CSE Laboratory maintenance schedule
Computing Requirements:	Covered by normal CSE Laboratory maintenance schedule
Library Requirements:	Only holding of recommended texts
Capital funds Requirements:	None

2.3 Servicing Implications:

There are no cross-Faculty servicing implications. As noted above, all of these courses are available as *electives* in programs that wish to note them in their elective lists.

2.4 Teaching Arrangements:

No other Units will contribute on a regular basis towards the teaching of this course.

2.5 Alternative Delivery Arrangements:

All delivery is in on-campus mode.

2.6 Multi-mode Delivery Guidelines

N/A

2.7 Details of Tuition Fees:

Standard as for other CSE courses.

3. AUTHORISATION

3.1 University Librarian's Endorsement

Note: *this section of the Proposal must be signed by a Library representative, stating:*

I have examined the Library needs related to the above proposal and certify that existing Library holdings, staffing, services and accommodation are adequate / inadequate (delete one) to cover the demands that are inherent in it.

Appropriate arrangements for the use of digitised material to support this course have been made by the Course Authority with the University Librarian.

Further Comments:

University Librarian
/ /2005

3.2 Head of School's Approval

Note: *this section of the Proposal must be signed by the Head of School, stating:*

I have examined the resource implications of the above proposal in regard to staff, space, materials, equipment, capital funds, and computing, and certify that the School can cover the demands that are inherent in it.

Further Comments:

Head of School
/ /2005

3.3 Dean's Approval

Note: *this section of the Proposal must be signed by the Dean, stating:*

I have examined the resource implications of the above proposal in regard to staff, space, materials, equipment, capital funds, and computing, and certify that:

(Tick whichever is applicable)

3.3.1 (i) the proposal involves no additional resources. (A statement from the Head of School explaining how this can be achieved must be provided); or

(ii) the proposal involves additional resources and it is proposed to redeploy existing resources within the faculty. (A statement from the Head of School explaining how this will be achieved must be provided); or

(iii) the proposal involves additional resources to be obtained as set out below; or

(iv) the additional resources essential to bring the proposal into effect cannot be found within resources available to the faculty.

3.2.2 **Fees** (delete if not applicable):

- a fee will not be charged for this program (other than HECS)
- a fee will be charged for this program for local fee-paying students
- a fee will be charged for international students

If a fee is to be charged the Dean certifies as follows:

I have ensured that the Vice-Chancellor has been advised of the proposed fee arrangements, and note that approval of fee arrangements is needed before the new program can be implemented.

3.3.3 the proposal conforms to the University's commitment to Equal Opportunity in Education.

Statement from Head of School on Source of Additional Resources and/or Further Comments:

Dean
/ /2005

Please refer to the following link for