Course staff
- Course convener and lecturer: Dr. Vijay Sivaraman
  Room 334, Electrical Engg. (G17), Tel: 9385 6577, Email: vijay@unsw.edu.au

Consultations
- Thursdays 4pm—5pm
- Students are strongly encouraged to use the open consultation hour rather than contact by email.

Course details
- This course is 6 units of credit.
- This course involves lectures.
- The expected workload for this course is 8 hours per week.
- Lecture times: Thu 6-9pm (EE G3).

Course aims
This course aims to develop an understanding of the process of architecting network systems, at scales ranging from national (e.g. NBN), to enterprise (e.g. campus) and embedded (e.g. in-vehicle) networks. We will try to bridge the gap between business needs and technology solutions, by learning how to: (a) identify and represent high-level goals and requirements, (b) develop broad architectures that best satisfy needs within given constraints, and (c) create design plans ready for implementation. Case-studies will include the Australian National Broadband Network (NBN) and a University campus network. Guest lecturers from Cisco Systems and group projects with practical architecture development will enhance student learning.

Relation to other courses
This course assumes knowledge of the fundamentals of data networking covered in TELE3118 “Network Technologies”, including the functions of the various layers in the TCP/IP protocol stack. Some prior knowledge of network performance, network security, and network management, covered respectively in courses TELE4642 “Network Performance”, TELE3119 “Trusted Networks”, and TELE9752 “Network operations and Control” respectively, will be useful, though is not essential for this course.
Student learning outcomes
Upon successful completion of this course, you will be able to:
• Describe the process of architecting a networking system
• Collect and categorise the requirements of the system
• Evaluate architectural components that best meet the requirements
• Analyse the interaction of the components and their trade-offs
• Develop broad design of network systems for specific deployment scenarios

The course delivery methods and course content address a number of core UNSW graduate attributes; these include:
• The skills involved in scholarly enquiry: This course develops an attitude towards keeping up to date with the latest methodology and technology.
• An in-depth engagement with the disciplinary knowledge in its inter-disciplinary context: This course will help appreciate the socio-economic context and technological and market advances in other disciplines that shape modern communication network systems.
• The capacity for analytical and critical thinking and for creative problem solving: This course develops the ability to analyse and criticise the design decisions that shape network systems, and to indulge in design problems outside the limits of principles and examples used in teaching.
• The ability to indulge in independent and reflective learning.
• The skills to appropriately locate, evaluate, and use relevant information.
• The capacity to contribute to and work within the international community.
• The skills required for collaborative and multi-disciplinary work.

The rationale behind the approach to learning and teaching
• This course covers a significant breadth of content, and in the lectures I hope to assimilate the technology components of the knowledge acquired in other courses with the business needs and requirements that arise in practical systems design. The lectures will be interactive and discussion-oriented, and I hope that the thought process through the design stages will become apparent to students in the lectures and help them retain the material better. I therefore strongly urge students to not miss classes, and to participate actively in class discussion.
• The group project in this course will require students to architect a specific networking system in substantial detail. This will stress the applicability of the course material to the real-world, and give students experience in defending their decisions in an in-class presentation.
**Teaching strategies**

- Lectures – to convey the process of architecture, and the steps in the context of specific case-studies.
- Project – the project will be discussed in-class within a group as well as with the instructor(s), and will be presented to the whole class and documented in the form of a final report. The project will provide you with the opportunity to demonstrate your ability to apply the concept of this course to a real-world situation.
- Mid-session test – will provide feedback on your understanding of the material.
- Final examination – final test of competency.

**Assessment**

- Class participation and notes scribing [10%]: Each group will be assigned a specific week for which they have to take extensive notes in class, and write it up in the form of a book chapter for submission to the instructor. These notes will subsequently be published on the course web-page for other students to comment on and to use towards study for the exams. Additionally students will also be marked on their class participation throughout the course.
- Mid-session test [10%]: This course will have an in-class written test of one hour that will evaluate and provide feedback on your understanding of the material in this course. The test will be held in week 7 (Thu 2 Sep). Re-tests will not be granted in the event that a student misses the test, unless satisfactory written evidence is presented of adverse conditions that prevented the student from taking the test. In such a case, the course coordinator may, at his discretion, conduct the re-test orally with the individual student, typically within two weeks of the original test date.
- Final exam [30%]: This three-hour final exam scheduled by the University will test your overall competency in the course.
- Project [50%]: A project will require you to architect a real-world networking system from requirements analysis to final design. You will have to present the first stage of your project in-class in week 10 (worth 10% of the grade), followed by a final presentation in week 12 or 13 (worth 10% of the grade). A final report (worth 30% of the grade) will be due in week 13 that will contain a comprehensive description of the architecture of your system. Late submissions will generally not be accepted.

**Course schedule**

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<th>Week</th>
<th>Topic</th>
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<tr>
<td>1</td>
<td>Introduction and background</td>
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<tr>
<td>2</td>
<td>Architecture processes and frameworks</td>
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<tr>
<td>3</td>
<td>Requirements analysis</td>
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<tr>
<td>4</td>
<td>Architecture components</td>
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<tr>
<td>5-6</td>
<td>Case studies: campus network, NBN</td>
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<tr>
<td>7</td>
<td>Mid-session test and project discussion</td>
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<tr>
<td>8-10</td>
<td>Project stage 1: Requirements Analysis</td>
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<tr>
<td>11-13</td>
<td>Project stage 2: Architecture and Design</td>
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Textbooks and Resources for students

- Sections from various other books, papers, and other reading material will be used throughout this course; information about these will be posted on the course web-page: https://subjects.ee.unsw.edu.au/gsoe9758/
- Students seeking resources can also obtain assistance from the UNSW Library; please see info.library.unsw.edu.au/web/services/services.html

Academic honesty and plagiarism

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<th>What is Plagiarism?</th>
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<td>Plagiarism is the presentation of the thoughts or work of another as one’s own.*</td>
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<td>Examples include:</td>
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<td>- 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;</td>
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<td>- paraphrasing another person’s work with very minor changes keeping the meaning, form and/or progression of ideas of the original;</td>
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<td>- piecing together sections of the work of others into a new whole;</td>
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<td>- 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</td>
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<td>- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†</td>
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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;
Course evaluation and development

- Students are strongly encouraged to provide feedback on the course during lectures, including suggestions for improving the course content, organisation, delivery, and assessment. Such feedback will be considered carefully with a view to acting on it constructively wherever possible.
- Towards the end of the course formal feedback will be gathered using the Course and Teaching Evaluation and Improvement (CATEI) Process.

Other matters

- Expectations and responsibilities of students: Students are expected to attend lectures since there is a lot of material in this course and class discussions will show the thought process behind the design, which will help in retention. Group study and problem-discussion is also highly encouraged.
- Special consideration for missed in-class tests requires provision of satisfactory written evidence within a week of the illness of misadventure; the re-test may be conducted orally by the course convenor within two weeks of the date of the missed test. Special consideration for final examination will have to go through the normal University procedures.
- Equity and diversity: 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 convenor 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](http://www.equity.unsw.edu.au/disabil.html). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional examination and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.