

Department of Electronic Engineering

GUIDE FOR POSTGRADUATE COURSEWORK STUDENTS 2010

Master of Biomedical Engineering
Master of Electronic Engineering
Master of Microelectronic Engineering
Master of Telecommunication Engineering
Master of Electronic Systems and Network Engineering
Master of Telecommunications and Network Engineering
Postgraduate Diploma in Electronic Engineering

Postgraduate Coursework Coordinator

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www.latrobe.edu.au/ee

Questions?

Important information can be found in the following web page.

www.latrobe.edu.au/ee/coursework_students/index.htm

www.ee.latrobe.edu.au/~dennis/PGadm/Welcome.htm

Cannot find an answer?

- For subject related questions, make an appointment to see your lecturer.
- For other study related questions, make an appointment to see the course coordinator whose consultation time is between *1:00 to 2:00 pm*.

Postgraduate Coursework Studies in Department of Electronic Engineering

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Where to get help

- Web
 - www.latrobe.edu.au/ee/coursework_students/index.htm
 - www.ee.latrobe.edu.au/~dennis/PGadm/Welcome.htm
- Make an appointment to see the coordinator, **between 1.00-2.00pm, Monday-Friday.**



Practical Classes

- A very important part of our units (and courses)
- Reinforce theory and assist students to develop important practical skills
- No practical classes in week one
- Some units have alternate practical class
 - i.e. group A; group B etc.
- Students only required to attend classes in one group



Assignments

- Must be submitted by the due date and time
- Usually 2pm Monday
- Post assignments into the correct assignment slot opposite PS2 118 (Physical Sciences 2 Building)
- Must have attached a statement of authorship
- Penalties for late assignments
- Submit late assignments directly to Margaret North PS2 118
- Assignments more than four (4) days late are not accepted!



Academic Misconduct & Plagiarism

- Taken very seriously by the Department, School, Faculty and University!
- Read policy on academic misconduct
 - see student guide (Appendix E)
 - see unit guides
 - Attend workshops
- **JUST DON'T DO IT** – if in doubt ask your lecturer (or other member of staff first)



Use of University Logos

- The crest, armorial bearings and corporate logo of La Trobe University can only be used when authorised by the Deputy Vice-Chancellor.
- Students must not use university logos without authorisation.



Exam Tutorials

During the examination study period each lecturer will be rostered on for a number of exam tutorials

- Usually, days leading up to their exam
- 2-4pm in BG 324
- Roster posted around department
- A good time to be sure of being able to speak with your lecturer



Department Facilities

- Coordinated through the Departmental Workshop (BG 315)

- Please report equipment failures, access problems to the workshop

– 1:30 – 2:30 Monday-Friday

– Web page:

<http://www.latrobe.edu.au/ee/workshop>



Work Room – BG 420

- 4th Level Beth Gleason Building
- For PG Coursework students only
- 24 hours, 7 days Access
 - see access to buildings & labs
 - access restricted when used for classes
- No Food or Drink
- Internal Telephone for university calls only (including Emergencies – ring 2222)



Tea Room – BG 445

- Postgraduate Students may use the Staff Tea Room during office hours, Monday-Friday
 - When not used for meetings, seminars etc
- Only use items from the refrigerator that you place there yourself
 - Mark your items of food and drink
- THERE IS NO CLEANING SERVICE FOR THE TEA ROOM
 - wash any cups etc that you use and clean up any mess



Computer Accounts and Student Email

- Generated as part of the enrolment process
 - Listed on your statement of enrolment
- Any problems see Study hall help desk
 - Between Glenn and Menzies Colleges
- Department provides extra storage space on our server, accessible from your account (H: drive)



Photocopying and Printing

- Facilities available in BG 420 (and many other labs)
- Operate on the Café Digital debit system
 - 8c per A4 page
- Department provides credit of \$20 each semester – beyond this students must add money to their accounts at Café Digital
 - Note: students must print first to activate their account. Any problems with \$20 printing credit, please see the workshop.



Access to Buildings and Computer Labs

Access to buildings and labs is controlled by an electronic access control system ("Cardax")

- PG Coursework students are entitled to personal access to the Beth Gleason Building level 4 and BG 420 (work room) 24/7 + other labs depending on their enrolment
- To apply for Cardax access fill out form on <http://www.latrobe.edu.au/ee/current/index.htm>
- To open door hold student card over proximity reader adjacent to the door

After Hours Use of Labs

Students will only be granted after-hours access to the building and labs if they agree to comply with the Department's After Hours policy, specifically:

1. to enter their details in the after-hours log book with name, ID number, enter and leave the building;
2. to evacuate the building without delay in the event that the evacuation signal sounds;
3. to advise security on 9479 2222 in the event of any emergency and
4. to refrain from consumption of food and drink in the lab.

**The workroom and other facilities are for use of Electronic Engineering postgraduate students only
- do not invite your friends here!**

Important Dates

March 19	Last day for 1st semester course transfers and unit additions without specific approval from the unit coordinator and course coordinator
August 13	Last day for 2nd semester course transfers and unit additions without specific approval from the unit coordinator and course coordinator

Course Organisation and Details

Staff and Their Role in the Postgraduate Coursework Programs

For matters concerning an individual subject, you should first approach the subject coordinator (and/or lecturer) in charge of that subject.

For more general matters associated with your course such as timetable problems and special consideration concerning a number of subjects, please contact the postgraduate coursework coordinator.

Course Transfers

Subject to the approval of the course coordinator, students may be permitted to transfer courses. Students wishing to apply for a course transfer must fill out an "Application to Transfer" form (available from the Faculty office) and submit it to the course coordinator for approval. Postgraduate students considering a course transfer must note the following:

- (i) course transfers are not permitted after the 2nd week of each semester. Course transfers are permitted again once semester results are available
- (ii) the International Programs Office must approve each course transfer by an international student
- (iii) the International Programs Office may charge a fee for second and subsequent course transfers

Variation of Enrolment

Up to the end of the second week of each semester students may vary their enrolment (i.e. change their enrolled units) via StudentOnLine (www.latrobe.edu.au/acadserv/current/studentonline.html) or via a "Variation of Enrolment" form (available from the Faculty office). After the second week of each semester students will NOT normally be permitted to add a unit to their enrolment (i.e. start studying a new unit). Any unit addition requests after the second week of semester must be made via a "Variation of Enrolment" form on which BOTH the unit coordinator and postgraduate coursework coordinator must indicate their approval.

Subjects not offered by Computer Science Department in 2010

CSE4PND and CSE4CPE

Students taking CSE4xxx subjects must studied ELE4NET or CSE3INE.

Master of Biomedical Engineering (SMBE)

The Master of Biomedical Engineering is structured to include core, foundation, specialised and elective subjects from Electronic Engineering with emphasis on developing core skills and knowledge base for the professional practice of Biomedical Engineering. The award of the degree requires the student to successfully complete a total of 240 credit points, which must include a biomedical engineering project. The normal duration of the course will be two years.

Course Structure

Year 1 (75 cp for core subjects and 45 cp for elective subjects)

Sem.	Subject Name	Subject Code	CP
1	Embedded Processors	ELE3EMP	15
1	Instrumentation Electronics and Sensors	ELE3IES	15
1	C Programming for Engineers and Scientists	CSE1CES	15
1	Elective		15
2	Digital Signal Processing	ELE3SIP	15
2	Communication Networks	ELE4NET	15
2	Elective		30

Year 2

Sem.	Subject Name	Subject Code	CP
2	Biomedical Engineering A	ELE3BIO	15
1	Biomedical Engineering B	ELE4BME	15
1	Advanced Signal processing	ELE4ASP	15
1	Medical Engineering	ELE5MEN	15
2	Clinical Engineering	ELE4CLN	15
2	Neural Engineering	ELE4NUE	15
1/2	Biomedical Design Exercise	ELE5BDE	30

NOTE: There is an exit pathway to take out a degree or diploma after two semesters study. However, the electives must be specifically chosen to enable this pathway.

- The Post Graduate Diploma in Electronic Engineering requires that ELE5PRA is taken during the first year of enrolment.
- The Master of Electronic Engineering requires that ELE5PRA (15CP) and a design exercise (ELE5NDE, or ELE5EDE - 30CP) are taken during the first year of enrolment.

Master of Electronic Engineering (SMEE)

The Master of Electronic Engineering course is a two-semester (one-year) full-time program requiring the successful completion of 120 credit points. Students should seek advice from a course advisor before enrolling. Where a student can demonstrate that they have previously covered the material in a required unit they may replace it with an elective – requires approval of course coordinator.

Core Subject (15 credit points)

Sem.	Subject Name	Subject code	CP
1/2	Engineering Practice	ELE5PRA	15

Project / Design Subjects

Each student selects a design/project option from the following:

(a) A 30 credit point single semester electronic engineering design exercise

Sem.	Subject Name	Subject code	CP
2	Electronic Engineering Design ¹¹	ELE5EDE	30
or			
1	Network Engineering Design ¹⁰	ELE5NDE	30
or			
1/2	Biomedical Engineering Design	ELE5BDE	30
or			
2	Telecommunication Engineering Design	ELE5TDE	30

(b) A 45 credit point two semester Electronic Engineering project¹³ (students enrol in both subjects)

1/2	Electronic Engineering Project A ¹	ELE5ERA	15
1/2	Electronic Engineering Project B ¹	ELE5ERB	30

(c) A 60 credit point two semester Electronic Engineering major project¹³ (students enrol in both subjects)

1/2	Electronic Engineering Major Project A ¹	ELE5MPA	30
1/2	Electronic Engineering Major Project B ¹	ELE5MPB	30

Elective Subjects

Remaining subjects are chosen from the following, according to the students' interest, to a total of 120 credit points for the entire program. The subjects offered may vary from year to year depending on demand staff availability.

Teaching period	Unit name	Unit code	Credit points
1	Advanced Studies in Telecommunication A ¹	ELE5ASA	15
2	Advanced Studies in Telecommunication B ¹	ELE5ASB	15
1	Advanced Topics A ^{1*}	ELE4ATA	15
2	Advanced Topics B ^{1*}	ELE4ATB	15
1	Advanced Topics in Telecommunications A ¹	ELE5TTA	15
2	Advanced Topics in Telecommunications B ¹	ELE5TTB	15
1 or 2	Directed Study ¹	ELE4DIR	15
2	Biomedical Engineering A ¹	ELE3BIO	15
1	Communications Systems	ELE3CMN	15
1	Control Systems	ELE3CON	15
1	Embedded Processors	ELE3EMB	15
1	Instrumentation Electronics and Sensors	ELE3IES	15
2	Advanced Instrumentation Electronics ⁵	ELE4AAE	15
1	Advanced Signal Processing ⁴	ELE4ASP	15
1	Biomedical Engineering B ^{1, 6}	ELE4BME	15
1	Radio Frequency Design ²	ELE4REFD	15
1	Broadband Digital Communications ²	ELE5BDC	15
1	Digital System Design ³	ELE5DSD	15
1	Integrated Circuit Design ³	ELE5ICD	15
1	Multimedia Communications ^{4*}	ELE5MMC*	15
1	Optical Networks ⁹	ELE5OPN	15
1	Personal Mobile Communications	ELE5PMC	15
1	Semiconductor Materials and Devices	ELE5SDP	15
1	Secure Communications*	ELE5SEC*	15
1	Telecommunications Systems Engineering	ELE5TSE	15
2	Digital Communication Systems	ELE3DCS	15
2	Electronic Design Automation-Tools and Technique	ELE3DDE	15
2	Image Processing and Coding	ELE5IPC	15
2	Digital Signal Processing	ELE3SIP	15
2	Antennas and Propagation ⁷	ELE4ANS	15
2	Clinical Engineering ¹	ELE4CLN	15
2	Digital Control Theory ⁸	ELE4DCT	15
2	Communications Networks ²	ELE4NET	15
2	Emerging Topics in IC Design	ELE5ETD	15
2	EDA Tools and Design Methodology*	ELE5TDM*	15

- Key: ¹ Enrolment subject to approval from the course coordinator.
- ² Requires units ELE3CMN (Communication Systems) and ELE3DCS (Digital Communication Systems) or prior equivalent studies.

- ³ Requires unit ELE3DDE (Electronic Design and Automation-Tools and Technique) or prior equivalent studies.
- ⁴ Requires unit ELE3SIP (Digital Signal Processing) or prior equivalent studies.
- ⁵ Requires unit ELE3IES (Instrumentation Electronics and Sensors) or prior equivalent studies.
- ⁶ Requires unit ELE3BIO (Biomedical Engineering A) or prior equivalent studies.
- ⁷ Requires unit ELE3RMO (RF, microwave and optical transmissions) or prior equivalent studies. From 2009 requires ELE3CMN and ELE3DCS.
- ⁸ Requires unit ELE3CON (Control Systems) or prior equivalent studies.
- ⁹ Incompatible with ELE4OFC (Optical Fibre Communication Systems).
- * Not offered in 2008.

Units offered by other departments

Subject to the approval of the course coordinator, students may take a maximum of two units (30 credit points) offered by other departments, provided that they are of an appropriate level and are considered relevant to the course. For example, the units offered by the Department of Computer Science and Computer Engineering applicable to this program include:

Teaching period	Unit name	Unit code	Credit points
1	C Programming for Engineers and Scientists	<u>CSE1CES</u>	15
1 or 2	Network Engineering Fundamentals	<u>CSE2NEF</u>	15
2	Pervasive Network Design	<u>CSE4PND</u> *	15
2	Networks Systems and Web Security	<u>CSE3NSW</u>	15
1	Communication Protocol Engineering	<u>CSE4CPE</u> *	15
2	Mobile and Pervasive Computing	<u>CSE4MPC</u>	15

*not offered in 2010

Specialisation in Biomedical Engineering

This popular specialisation provides graduates with quality training in both instrumentation and clinical aspects of the biomedical engineering field. Students intending to study this specialisation must include the following subjects in their enrolment and undertake relevant project work:

Sem.	Subject Name	Subject code	CP
1	Biomedical Engineering A	ELE3BIO	15
1	Biomedical Engineering B	ELE4BME	15
2	Clinical Engineering	ELE4CLN	15
1	Instrumentation and Sensors	ELE3IES	15
1/2	Biomedical Engineering Design	ELE5BDE	30

Subject Details

For greater detail of the units listed above see Appendix C.

Notes:

- ¹ Enrolment subject to approval from the course co-ordinator
- ² Requires foundation subjects ELE3CMN and ELE3TEL or prior equivalent studies
- ³ Requires foundation subject ELE3DDE or prior equivalent studies
- ⁴ Requires foundation subject ELE3SIP or prior equivalent studies
- ⁵ Requires foundation subject ELE3ACD or prior equivalent studies
- ⁶ Requires foundation subject ELE3BME or prior equivalent studies

- 7 Requires foundation subject ELE3RMO or prior equivalent studies
- 8 Requires foundation subject ELE3CON or prior equivalent studies
- 9 Incompatible with ELE4OFC
- 10 Requires prerequisite subject ELE4NET
- 11 Requires prerequisite subject ELE3EMP
- 12 Requires foundation subject CSE2NEF or prior equivalent studies
- 13 Enrolment in the 45 or 60 credit point projects is usually restricted to students achieving an average of 70% or greater in their studies.

Master of Telecommunication Engineering (SMTE)

The Master of Telecommunication Engineering course is a two-semester (one-year) full-time program requiring the successful completion of 120 credit points. Students should seek advice from a course advisor before enrolling. Where a student can demonstrate that they have previously covered the material in a required unit they may replace it with an elective – requires approval of course co-ordinator.

Core Subjects (60 credit points)

Sem.	Subject Name	Subject code	CP
1/2	Engineering Practice	ELE5PRA	15
+ minimum three from			
1	Broadband Digital Communication ²	ELE5BDC	15
1	Optical Networks ⁸	ELE5OPN	15
1	Personal Mobile Communication ²	ELE5PMC	15
1	Telecommunications Systems Engineering	ELE5TSE	15
2	Antennas and Propagation ³	ELE4ANS	15
2	Advanced Communication Systems ²	ELE4ACS	15
2	Communications Networks ²	ELE4NET	15

Project / Design Subjects

Each student selects a design/project option from the following:

(a) A 30 credit point single semester telecommunications or network engineering design exercise

Sem.	Subject Name	Subject code	CP
2	Telecommunications Design ⁹	ELE5TDE	30
or			
1	Network Engineering Design ¹⁰	ELE5NDE	30

(b) A 45 credit point two semester telecommunications project¹² (students enrol in both subjects)

1/2	Telecommunications Project A ¹	ELE5TRA	15
1/2	Telecommunications Project B ¹	ELE5TRB	30

(c) A 60 credit point two semester telecommunications major project¹² (students enrol in both subjects)

1/2	Telecommunications Major Project A ¹	ELE5TPA	30
1/2	Telecommunications Major Project B ¹	ELE5TPB	30

Elective Subjects

A total of 120 credit points is required for the entire program. The remaining subjects are chosen from the other core subjects or from the following electives, according to the students' interest. The subjects offered may vary from year to year depending on demand staff availability.

Sem.	Subject Name	Subject Code	CP
1	Semiconductor Materials & Devices	ELE5SDP	15
2	Advanced Instrumentation Electronics ⁶	ELE4AAE	15
1	Applied Management for Engineers	ELE4EMT	15
1	Integrated Circuit Design ⁴	ELE5ICD	15
1	Multimedia Communications ⁵	ELE5MMC (not available in 2008)	15
1	Digital System Design ⁴	ELE5DSD	15
1	Radio Frequency Design ²	ELE4RFD	15
1	Communications Systems	ELE3CMN	15
1	Embedded Processors	ELE3EMP	15
1	Control Systems	ELE3CON	15
1	Analog Circuits & Devices	ELE3ACD	15
2	Advanced Signal Processing ⁵	ELE4ASP	15
2	EDA Tools and Design Methodology	ELE5TDM (not available in 2008)	15
2	Emerging Topics in IC Design	ELE5ETD	15
2	Digital Control Theory ⁷	ELE4DCT	15
2	Electronic Design Automation	ELE3DDE	15
2	Digital Signal Processing	ELE3SIP	15
1	Instrumentation and Sensors	ELE3IES	15
2	RF, Microwave and Optical Transmission	ELE3RMO (not available in 2008)	15
2	Telecommunication Devices, Circuits and Systems	ELE3TEL (not available in 2008)	15
1/2	Advanced Studies in Telecommunication A/B ¹	ELE5ASB	15
1/2	Advanced Topics in Electronic Engineering A/B ¹	ELE4ATB	15
1/2	Advanced Topics in Telecommunications A/B ¹	ELE5TTA/ELE5TTB	15
1	Optical networks	ELE5OPN	15

Subjects offered by other Departments

Subject to the approval of the course coordinator students may take a maximum of two subjects offered by other departments, provided that they are of appropriate level and considered relevant to the course. For example, subjects offered by the Department of Computer Science and Computer Engineering applicable to this program include:

Teaching period	Unit name	Unit code	Credit points
1	C Programming for Engineers and Scientists	<u>CSE1CES</u>	15
1 or 2	Network Engineering Fundamentals	<u>CSE2NEF</u>	15
2	Pervasive Network Design	<u>CSE4PND</u>	*15
2	Networks Systems and Web Security	<u>CSE3NSW</u>	15
1	Communication Protocol Engineering	<u>CSE4CPE</u>	*15
2	Mobile and Pervasive Computing	<u>CSE4MPC</u>	15

*not offered in 2010

Subject Details

For greater detail of the subjects listed above see Appendix E.

Notes:

- 1 Enrolment subject to approval from the course co-ordinator
- 2 Requires foundation subjects ELE3CMN and ELE3TEL or prior equivalent studies
- 3 Requires foundation subject ELE3RMO or prior equivalent studies
- 4 Requires foundation subject ELE3DDE or prior equivalent studies
- 5 Requires foundation subject ELE3SIP or prior equivalent studies
- 6 Requires foundation subject ELE3ACD or prior equivalent studies
- 7 Requires foundation subject ELE3CON or prior equivalent studies
- 8 Incompatible with ELE4OFC
- 9 Requires prerequisite subject ELE5PMC
- 10 Requires prerequisite subject ELE4NET
- 11 Requires foundation subject CSE2NEF or prior equivalent studies
- 12 Enrolment in the 45 or 60 credit point projects is usually restricted to students achieving an average of 70% or greater in their studies

Master of Microelectronic Engineering (SMME)

In the Master of Microelectronic Engineering, students complete 240 credit points over two years, or part time equivalent. There are 135 credit points of core subjects, of which 60 credit points are 4th year fundamentals subjects. In the final year of study students undertake a major (60 credit point) or minor (30 credit point) microelectronics design project. The remaining credit points are made up of electives consisting of further studies in microelectronics or allied disciplines, which includes the pool of 4th and 5th year subjects offered by the Department of Electronic Engineering.

Students with an appropriate background that includes the material covered by the fundamental subjects may be granted a one semester advanced entry credit, shortening the program to three semesters (full-time). Alternatively, individual fundamentals subjects can be replaced with further electives where a student has demonstrated knowledge of the material covered.

Note: not all subjects listed below are available in both semesters

Core subjects: (135 credit points)

Sem.	Subject Name	Subject code	CP
1/2	Engineering Practice	ELE5PRA	15
1	Applied Management for Engineers	ELE4EMT	15
1	Embedded Processors	ELE3EMP	15
1	Digital Systems Design	ELE5DSD	15
1	Integrated Circuit Design	ELE5ICD	15
1	Semiconductor Materials and Devices	ELE5SDP	15
2	Electronic Design Automation	ELE3DDE	15
2	Test and Verification	ELE4TAV	15

Project subjects: (30 or 60 credit points)

½	Minor Project in Microelectronics ¹	ELE5MIP	30
Or			
½	Major Project in Microelectronics ^{1,2}	ELE5MAP	60

Elective subjects: (60 or 30 credit points)

Sem.	Subject Name	Subject code	CP
1	C Programming for Engineers and Scientists	CSE1CES	15
2	Object-oriented programming using C++	CSE1CPP	15
2	Digital Signal Processing	ELE3SIP	15
2	Emerging Topics in Microelectronics	ELE5ETD	15
2	Special Elective in Microelectronic Engineering ²	ELE5SEL	15
1	Advanced Signal Processing	ELE4ASP	15

and/or approved 4th and 5th year subjects offered by the Department of Electronic Engineering, or areas of the University² (such as, Computer Science and Computer Engineering, Mathematics, Physics or Statistics).

Notes:¹Students complete one of these two subjects ²Enrolment subject to approval from the course co-ordinator. Enrolment in the Major Project in Microelectronics is usually restricted to students achieving a 70% or greater average in the course.

Master of Electronic Systems and Network Engineering (SMESNE)

The Master of Electronic Systems and Network Engineering is structured to include core, foundation, specialised and elective subjects from Electronic Engineering and Computer Science in the areas of electronic systems and networks with a number of electives from Electronic Engineering and Computer Science. Students complete 240 credit points over the two years of the degree, which must include an Electronic Engineering project. The normal duration of the course is two years. Students should seek advice from a course advisor before enrolling. Where a student can demonstrate that they have previously covered the material in a required unit they may replace it with an elective – requires approval of course co-ordinator.

Students may select a maximum of 60 credit points of Foundation subjects (offered from either Computer Science or Electronic Engineering) depending on their background and the area(s) in which they wish to specialize. Students then choose a minimum of 60 credit points of Specialised Computer Networks subjects and a minimum of 30 credit points of specialised Electronic Engineering subjects. They must include a 30 credit point, 45 credit point or 60 credit point engineering Project. Elective subjects from the list of Specialised and Advanced subjects offered by the Departments of Computer Science and Computer Engineering (CS&CE), and Electronic Engineering (EE) (which may include a CSE40THE) comprise the remaining credit points. Students who take less than the maximum 4 Foundation subjects, choose additional electives from the pool of subjects offered by CS&CE and EE. Subject to approval by the course co-ordinator, students may enrol in up to two relevant subjects to the value of 30 credit points, from other areas of the University.

A typical enrolment for students with a background in Electronic Systems would be:

2 Core subjects	30 credit points
2 Foundation Computer Networks subjects	30 credit points
4 Specialised Computer Networks subjects	60 credit points
2 Specialised Electronic Engineering subjects	30 credit points
1 Engineering Project	30 credit points
1 Advanced Computer Science elective	15 credit points
3 Advanced Electronic Engineering electives	45 credit points

Total: 240 credit points

A typical enrolment for students with a background in Computer Science would be:

2 Core subjects	30 credit points
Minimum of 2 Foundation Electronic Engineering subjects	30 credit points
2 Specialised Electronic Engineering subjects	30 credit points
1 Engineering Project	30 credit points
4 Specialised Computer Networks subjects	60 credit points
1 Advanced Electronic Engineering electives	15 credit points
3 Advanced Computer Science electives	45 credit points

Total: 240 credit points

Core Subjects (30 credit points)

Sem.	Subject Name	Subject code	CP
1/2	Engineering Practice	ELE5PRA	15
Plus			
1	C Programming for Engineers and Scientists	CSE1CES	15

Electronic Engineering Project / Design Subjects (30 credit points minimum)

Each student selects a design/project option from the following:

(a) A minimum 30 credit point single semester electronic or network engineering design exercise, with the approval of the course coordinator students may study more than one 30 credit point design exercise unit.

Sem.	Subject Name	Subject code	CP
2	Electronic Engineering Design ¹³	ELE5EDE	30
or			
1	Network Engineering Design ¹²	ELE5NDE	30
or			
1/2	Biomedical Engineering Design	ELE5BDE	30

(b) A 45 credit point two semester Electronic Engineering project¹⁴ (students enrol in both subjects)

1/2	Electronic Engineering Project A ¹	ELE5ERA	15
1/2	Electronic Engineering Project B ¹	ELE5ERB	30

(c) A 60 credit point two semester Electronic Engineering major project¹⁴ (students enrol in both subjects)

1/2	Electronic Engineering Major Project A ¹	ELE5MPA	30
1/2	Electronic Engineering Major Project B ¹	ELE5MPB	30

Specialist Computer Networks Subjects

A minimum of 60 credit points (four subjects) from:

Sem.	Subject Name	Subject Code	CP
2	Pervasive Network Design ²	CSE4PND*	15
2	Performance Analysis of Computer Systems	CSE4PCS	15
1	Real-Time and Fault-Tolerant Systems	CSE4RFS	15
1	Protocol and Network Engineering ³	CSE4CPE*	15
1	Wireless Networks Engineering ²	CSE4WNE	15
2	Mobile and Pervasive Computing ²	CSE4MPC	15
2	Advanced Network Engineering	CSE4ANE	15

*not offered in 2010

Specialist Electronic Engineering Subjects

A minimum of 30 credit points (two subjects) from:

Sem.	Subject Name	Subject Code	CP
1	Advanced Instrumentation Electronics ⁴	ELE4AAE	15
1	Advanced Signal Processing ⁵	ELE4ASP	15
1	Biomedical Engineering B ⁶	ELE4BME	15
1	Digital Systems Design ⁷	ELE5DSD	15
1	Optical Networks ⁸	ELE5OPN	15
2	Clinical Engineering ⁶	ELE4CLN	15
2	Communications Networks ⁹ (Highly Recommended)	ELE4NET	15

Level 2 and 3 units

A maximum of 60 credit points (four units) may be selected from the list below:

Teaching period	Unit name	Unit code	Credit points
1 or 2	Network Engineering Fundamentals	<u>CSE2NEF</u>	15
1	Intermediate Network Engineering	<u>CSE3INE</u>	15
2	Biomedical Engineering A	<u>ELE3BIO</u>	15
1	Communication Systems	<u>ELE3CMN</u>	15
1	Control Systems	<u>ELE3CON</u>	15
1	Embedded Processors	<u>ELE3EMB</u>	15
1	Instrumentation Electronics and Sensors	<u>ELE3IES</u>	15
2	Network, System and Web Security	<u>CSE3NSW</u>	15
2	Digital Communication Systems	<u>ELE3DCS</u>	15
2	Electronic Design Automation-Tools and Technique	<u>ELE3DDE</u>	15
2	Digital Signal Processing	<u>ELE3SIP</u>	15

Elective units

Advanced computer science – units offered may vary from year to year, depending on demand and staff availability:

Teaching period	Unit name	Unit code	Credit points
1 and 2	Thesis A and Thesis B	<u>CSE4THA</u> and <u>CSE4THB</u>	30 plus 30
1	Advanced Databases	<u>CSE4ADB</u>	15
1	Advanced Games Programming Technology	<u>CSE4AGT</u>	15
1	Real-Time and Fault-Tolerant Systems	<u>CSE4RFS</u>	15
1/2	Advanced Graphics	<u>CSE4AGR</u>	15
2	Data Mining	<u>CSE4DMI</u>	15
2	Performance Analysis of Computer Systems	<u>CSE4PCS</u>	15

Elective units

Advanced electronic engineering – units offered may vary from year to year, depending on demand and staff availability.

Teaching period	Unit name	Unit code	Credit points
1 or 2	Directed Study ¹	<u>ELE4DIR</u>	15
1	Advanced Topics A ^{1*}	<u>ELE4ATA</u>	15
2	Advanced Topics B ^{1*}	<u>ELE4ATB</u>	15
1	Radio Frequency Design	<u>ELE4RFD</u>	15
1	Advanced Studies in Telecommunication A ¹	<u>ELE5ASA</u>	15
1	Broadband Digital Communications ⁹	<u>ELE5BDC</u>	15
1	Integrated Circuit Design	<u>ELE5ICD</u>	15
1	Multimedia Communications ^{9*}	<u>ELE5MMC</u> *	15
1	Secure Communications*	<u>ELE5SEC</u> *	15
1	Semiconductor Materials and Devices	<u>ELE5SDP</u>	15
1	Personal Mobile Communications	<u>ELE5PMC</u>	15
1	Telecommunications Systems Engineering	<u>ELE5TSE</u>	15
2	Image Processing and Coding	<u>ELE5IPC</u>	15
2	Antennas and Propagation ¹⁰	<u>ELE4ANS</u>	15
2	Digital Control Theory ¹¹	<u>ELE4DCT</u>	15
2	Emerging Topics in IC Design	<u>ELE5ETD</u>	15
2	EDA Tools and Design Methodology*	<u>ELE5TDM</u> *	15
2	Advanced Studies in Telecommunication B ^{1*}	<u>ELE5ASB</u>	15

- Key: ¹ Enrolment subject to approval from the course coordinator.
- ² Requires unit CSE2NEF (Data Communications Networks), or prior equivalent studies.
- ³ N/A
- ⁴ Requires unit ELE43IES (Instrumentation Electronics and Sensors) or prior equivalent studies.
- ⁵ Requires unit ELE3SIP (Digital Signal Processing) or prior equivalent studies.
- ⁶ Requires units ELE3BIO (Biomedical Engineering A) and ELE3IES (Instrumentation Electronics and Sensors) or prior equivalent studies.
- ⁷ Requires unit ELE3DDE (Electronic Design Automation-Tools and Technique) or prior equivalent studies.
- ⁸ Incompatible with ELE4OFC (Optical Fibre Communication Systems).
- ⁹ Requires units ELE3CMN (Communication Systems) and ELE3DCS (Digital Communication Systems) or prior equivalent studies.
- ¹⁰ Requires unit ELE3RMO (RF, Microwave and Optical Transmission) or prior equivalent studies. From 2009 requires ELE3CMN and ELE3DCS.
- ¹¹ Requires unit ELE3CON (Control Systems) or prior equivalent studies.

* Not offered in 2008.

Specialisation in Biomedical Engineering

This popular specialisation provides graduates with quality training in both instrumentation and clinical aspects of the biomedical engineering field. Students intending to study this specialisation must include the following subjects in their enrolment and undertake relevant project work:

Sem.	Subject Name	Subject code	CP
1	Biomedical Engineering A	ELE3BIO	15
1	Biomedical Engineering B	ELE4BME	15
2	Clinical Engineering	ELE4CLN	15
1	Instrumentation and Sensors	ELE3IES	15
1/2	Biomedical Engineering Design	ELE5BDE	30

Subject Details

For greater detail of the subjects listed above see Appendix E.

Cisco CCNA Certification and Academy Program

La Trobe University offers a pathway to Cisco CCNA certification (Cisco Certified Network Associate) and the CCNA Academy Program. Required units are CSE3INE, CSE3INE and CSE2NEF or ELE4NET. For further information regarding CCNA certification and the CCNA Academy Program, please contact Dr. Prakash Veeraraghavan (PS4 169), email: p.veera@latrobe.edu.au

Master of Telecommunications and Network Engineering (SMTNE)

Course Structure

The Master of Telecommunications and Network Engineering is structured to include core, foundation, specialised and elective subjects from Electronic Engineering and Computer Science in the areas of telecommunication and network engineering with a number of electives from Electronic Engineering and Computer Science. Students complete 240 credit points over the two years of the degree, which must include an engineering project. The normal duration of the course is two years. Students should seek advice from a course advisor before enrolling. Where a student can demonstrate that they have previously covered the material in a required unit they may replace it with an elective – requires approval of course co-ordinator.

Students may select a maximum of 60 credit points of Foundation subjects (offered from either Computer Science or Electronic Engineering) depending on their background and the area(s) in which they wish to specialize. Students then choose a minimum of 60 credit points of Specialised Computer Networks subjects. They must also include a minimum of 45 credit points of Specialised Telecommunications, plus a 30 credit point, 45 credit point or 60 credit point engineering project. Elective subjects from the list of Specialised and Advanced subjects offered by the Departments of Computer Science and Computer Engineering (CS&CE), and Electronic Engineering (EE) (which may include a CSE40THE) comprise the remaining credit points. Students who take less than the maximum 4 Foundation subjects, choose additional electives from the pool of subjects offered by CS&CE and EE. Subject to approval by the course co-ordinator, students may enrol in up to two relevant subjects to the value of 30 credit points, from other areas of the University.

A typical enrolment for students with a background in Telecommunications would be:

2 Core subjects	30 credit points
2 Foundation Computer Networks subjects	30 credit points
4 Specialised Computer Networks subjects	60 credit points
3 Specialised Telecommunication Engineering subjects	45 credit points
1 Engineering Project	30 credit points
1 Advanced Computer Science elective	15 credit points
2 Advanced Telecommunication Engineering electives	30 credit points
Total:	240 credit points

A typical enrolment for students with a background in Computer Science would be:

2 Core subjects	30 credit points
Minimum 2 Foundation Telecommunication/Electronic Eng. subjects	30 credit points
3 Specialised Telecommunication Engineering subjects	45 credit points
1 Engineering Project	30 credit points
4 Specialised Computer Networks subjects	60 credit points
3 Advanced Computer Science electives	45 credit points
Total:	240 credit points

Core Subjects (30 credit points)

Sem.	Subject Name	Subject code	CP
1/2	Engineering Practice	ELE5PRA	15
Plus			
1	C Programming for Engineers and Scientists	CSE1CES	15

Telecommunications Project / Design Subjects (minimum 30 credit points)

Each student selects a design/project option from the following:

(a) A 30 credit point single semester telecommunications or network engineering design exercise, with approval by the course coordinator students may study both 30 credit point design exercise units

Sem.	Subject Name	Subject code	CP
2	Telecommunications Design ¹²	ELE5TDE	30
or			
1	Network Engineering Design ¹³	ELE5NDE	30

(b) A 45 credit point two semester telecommunications project¹⁴ (students enrol in both subjects)

1/2	Telecommunications Project A ¹	ELE5TRA	15
1/2	Telecommunications Project B ¹	ELE5TRB	30

(c) A 60 credit point two semester telecommunications major project¹⁴ (students enrol in both subjects)

1/2	Telecommunications Major Project A ¹	ELE5TPA	30
1/2	Telecommunications Major Project B ¹	ELE5TPB	30

A minimum of 60 credit points (four subjects) from:

Sem.	Subject Name	Subject Code	CP
2	Pervasive Network Design ²	CSE4PND*	15
2	Performance Analysis of Computer Systems	CSE4PCS	15
1	Real-Time and Fault-Tolerant Systems	CSE4RFS	15
1	Protocol and Network Engineering ³	CSE4CPE*	15
1	Wireless Networks Engineering ²	CSE4WNE	15
2	Mobile and Pervasive Computing ²	CSE4MPC	15
2	Advanced Network Engineering	CSE4ANE	15

*not offered in 2010

Specialist Telecommunication Engineering Subjects

A minimum of 45 credit points (three subjects) from:

1	Broadband Digital Communication ⁴	ELE5BDC	15
1	Optical Networks ¹⁰	ELE5OPN	15
1	Personal Mobile Communication ⁴	ELE5PMC	15

1	Telecommunications Systems Engineering	ELE5TSE	15
2	Antennas and Propagation ⁵	ELE4ANS	15
2	Advanced Communications Systems ⁴	ELE4ACS	15
2	Communications Networks ⁴	ELE4NET	15

Level 2 and 3 units

A maximum of 60 credit points may be taken from the following list:

Teaching period	Unit name	Unit code	Credit points
1 or 2	Network Engineering Fundamentals	<u>CSE2NEF</u>	15
1	Intermediate Network Engineering	<u>CSE3INE</u>	15
1	Communication Systems	<u>ELE3CMN</u>	15
1	Control Systems	<u>ELE3CON</u>	15
1	Embedded Processors	<u>ELE3EMB</u>	15
1	Instrumentation Electronics and Sensors	<u>ELE3IES</u>	15
2	Networks Systems and Web Security	<u>CSE3NSW</u>	15
2	Digital Communication Systems	<u>ELE3DCS</u>	15
2	Electronic Design Automation-Tools and Technique	<u>ELE3DDE</u>	15
2	Digital Signal Processing	<u>ELE3SIP</u>	15

Elective units

Advanced computer science

Units offered may vary from year to year depending on demand and staff availability.

Teaching period	Unit name	Unit code	Credit points
1 and 2	Thesis A and Thesis B	<u>CSE4THA</u> and <u>CSE4THB</u>	30 plus
1	Advanced Databases	<u>CSE4ADB</u>	15
1	Advanced Games Programming Technology	<u>CSE4AGT</u>	15
1	Real-Time and Fault-Tolerant Systems	<u>CSE4RFS</u>	15
1	Software Engineering and Project Management	<u>CSE4SPM</u>	15
1	Web Services Engineering	<u>CSE4WSE</u>	15
2	Advanced Graphics	<u>CSE4AGR</u>	15
2	Data Mining	<u>CSE4DMI</u>	15
2	Performance Analysis of Computer Systems	<u>CSE4PCS</u>	15

Elective units

Advanced electronic engineering

Units offered may vary from year to year, depending on demand and staff availability.

Teaching period	Unit name	Unit code	Credit points
1	Digital System Design ⁶	<u>ELE5DSD</u>	15
1	Optical Networks ¹⁰	<u>ELE5OPN</u>	15

Teaching period	Unit name	Unit code	Credit points
1	Secure Communications*	<u>ELE5SEC</u> *	15
1	Semiconductor Materials and Devices	<u>ELE5SDP</u>	15
2	Advanced Instrumentation Electronics ⁸	<u>ELE4AAE</u>	15
1	Advanced Signal Processing ⁷	<u>ELE4ASP</u>	15
1	Radio Frequency Design	<u>ELE4RFD</u>	15
1	Integrated Circuit Design	<u>ELE5ICD</u>	15
1	Telecommunications Systems Engineering	<u>ELE5TSE</u>	15
2	EDA Tools and Design Methodology*	<u>ELE5TDM</u> *	15
2	Emerging Topics in IC Design	<u>ELE5ETD</u>	15
2	Antennas and Propagation ⁵	<u>ELE4ANS</u>	15
2	Communications Networks ⁴	<u>ELE4NET</u>	15
2	Digital Control Theory ⁹	<u>ELE4DCT</u>	15
1	Advanced Studies in Telecommunication A ¹	<u>ELE5ASA</u>	15
2	Advanced Studies in Telecommunication B ¹	<u>ELE5ASB</u>	15
1	Advanced Topics A ^{1*}	<u>ELE4ATA</u>	15
2	Advanced Topics B ^{1*}	<u>ELE4ATB</u>	
1	Advanced Topics in Telecommunications A ¹	<u>ELE5TTA</u>	15
2	Advanced Topics in Telecommunications B ¹	<u>ELE5TTB</u>	15
1 or 2	Directed Study ¹	<u>ELE4DIR</u>	15
2	Image Processing and Coding	<u>ELE5IPC</u>	15

- Key: ¹ Enrolment subject to approval from the course coordinator.
- ² Requires unit CSE2NET (Data Communications Networks) or prior equivalent studies.
- ³ Requires unit CSE2NEF (Network Engineering Fundamentals), or prior equivalent studies.
- ⁴ Requires units ELE3CMN (Communication Systems) and ELE3DCS (Digital Communication Systems) or prior equivalent studies.
- ⁵ Requires unit ELE3RMO (RF, Microwave and Optical Transmission) or prior equivalent studies. From 2009 requires units CSE3CMN and ELE3DCS.
- ⁶ Requires unit ELE3DDE (Electronic Design and Automation-Tools and Technique) or prior equivalent studies.
- ⁷ Requires unit ELE3SIP (Digital Signal Processing) or prior equivalent studies.
- ⁸ Requires unit ELE3IES (Instrumentation Electronics and Sensors) or prior equivalent studies.
- ⁹ Requires unit ELE3CON (Control Systems) or prior equivalent studies.
- ¹⁰ Incompatible with ELE4OFC (Optical Fibre Communication Systems).

* Not offered in 2008.

Foundation Subjects

A maximum of 60 credit points (four subjects) from:

Sem.	Subject Name	Subject Code	CP
1/2	Network Engineering Fundamentals	CSE2NEF	15
1	Intermediate NetWork Engineering	CSE3INE	15
2	Networks and Systems Security	CSE3NSW	15
1	Analog Circuits & Devices	ELE3ACD	15
1	Communication Systems	ELE3CMN	15
1	Control Systems	ELE3CON	15

1	Embedded Processors	ELE3EMP	15
2	Digital Signal Processing	ELE3SIP	15
2	Electronic Design Automation	ELE3DDE	15
1	Instrumentation and Sensors	ELE3IES	15
2	RF, Microwave and Optical Transmission	ELE3RMO	15
2	Telecommunication Devices, Circuits and Systems	ELE3TEL	15

Elective Subjects

Advanced Computer Science - subjects offered may vary from year to year depending on demand and staff availability. Also includes remaining specialist computer networks subjects.

Sem.	Subject Name	Subject Code	CP
1	Advanced games Programming Technology	CSE4AGT	15
1	Directed Study ¹	CSE4DIR	15
1	Neural Networks	CSE4NN	15
1	Software Engineering and Project Management	CSE4SPM	15
1	Software Tools and Case	CSE4STC	15
1	Advanced Databases	CSE4ADB	15
2	Advanced Graphics	CSE4AGR	15
2	Data Mining	CSE4DMI	15

Advanced Electronic Engineering - subjects offered may vary from year to year depending on demand and staff availability. Also includes remaining specialist telecommunication engineering subjects.

Sem.	Subject Name	Subject Code	CP
1	Digital Systems Design ⁶	ELE5DSD	15
1	Semiconductor Materials & Devices	ELE5SDP	15
1	Advanced Instrumentation Electronics ⁸	ELE4AAE	15
1	Applied Management for Engineers	ELE4EMT	15
1	Radio Frequency Design	ELE4RFD	15
2	Advanced Signal Processing ⁷	ELE4ASP	15
2	EDA Tools and Design Methodology	ELE5TDM	15
2	Emerging Topics in IC Design	ELE5ETD	15
2	Integrated Circuit Design	ELE5ICD	15
2	Digital Control Theory ⁹	ELE4DCT	15
1/2	Advanced Studies in Telecommunications A/B ¹	ELE5ASA/ELE5ASB	15
1/2	Advanced Topics in Electronic Engineering A/B ¹	ELE4ATA/ELE4ATB	15
1/2	Advanced Topics in Telecommunications A/B ¹	ELE5TTA/ELE5TTB	15

Subject Details

For greater detail of the subjects listed above see Appendix E.

Cisco CCNA Certification and Academy Program

La Trobe University offers a pathway to Cisco CCNA certification (Cisco Certified Network Associate) and the CCNA Academy Program. Required units are CSE41FPP, CSE42FLN and CSE41/42FNT or ELE42NET. For further information regarding CCNA certification and the

CCNA Academy Program, please contact Dr. Prakash Veeraraghavan (PS4 169), email: p.veera@latrobe.edu.au

Notes:

- 1 Enrolment subject to approval from the course co-ordinator
- 2 Requires foundation subject CSE3NET or prior equivalent studies
- 3 Requires foundation subject CSE2NEF or CSE3INE or CSE3INE or prior equivalent studies
- 4 Requires foundation subjects ELE3CMN and ELE3TEL or prior equivalent studies
- 5 Requires foundation subject ELE3RMO or prior equivalent studies
- 6 Requires foundation subject ELE3DDE or prior equivalent studies
- 7 Requires foundation subject ELE3SIP or prior equivalent studies
- 8 Requires foundation subject ELE3ACD or prior equivalent studies
- 9 Requires foundation subject ELE3CON or prior equivalent studies
- 10 Incompatible with ELE4OFC
- 11 May only be offered in one semester, see Appendix A: Subject table for details.
- 12 Requires prerequisite subject ELE5PMC.
- 13 Requires prerequisite subject ELE4NET.
- 14 Enrolment in the 45 or 60 credit point projects is usually restricted to students achieving an average of 70% or greater in their studies.

Postgraduate Diploma in Electronic Engineering (SPEE)

This course has been designed for individuals wanting to update their skills in one of the four areas (biomedical, communication/telecommunication, electronic systems, or optical engineering) offered in the course. The course consists of one year of full-time study or its part-time equivalent.

For candidates with a four year degree in engineering or science (with an electronics major), the course provides a means to keep up with state-of-the-art developments in these specialist areas. Alternatively this course offers the opportunity for candidates with three year qualifications (such as BSc, or BTech) to prepare for higher degree study in the Master of Electronic Engineering or Master of Telecommunications Engineering by coursework degrees, or the Master of Engineering by Research degree.

Admission requirements

Applicants should hold a Bachelor's degree (three year minimum) in a relevant area.

Course structure

This 120-credit point course comprises a 15-credit point core unit (ELE5PRA) and seven 15-credit point elective units.

Core unit (15 credit points)

Teaching period	Unit name	Unit code	Credit points
TE-SEM-1 or TE-SEM-2	Engineering Practice	<u>ELE5PRA</u>	15

Elective units (105 credit points)

The remaining seven units are chosen from the following, according to the student's background and interests. The units offered may vary from year to year, depending on demand and staff availability.

Teaching period	Unit name	Unit code	Credit points
TE-SEM-1 or TE-SEM-2	Directed Study ¹	<u>ELE4DIR</u>	15
TE-SEM-1	Communication Systems	<u>ELE3CMN</u>	15
TE-SEM-1	Control Systems	<u>ELE3CON</u>	15
TE-SEM-1	Embedded Processors	<u>ELE3EMB</u>	15
TE-SEM-1	Instrumentation Electronics and Sensors	<u>ELE3IES</u>	15
TE-SEM-2	Advanced Instrumentation Electronics	<u>ELE4AAE</u>	15
TE-SEM-1	Advanced Digital Systems Design	<u>ELE4ADD</u>	15

Teaching period	Unit name	Unit code	Credit points
TE-SEM-1	Advanced Signal Processing	<u>ELE4ASP</u>	15
TE-SEM-1	Biomedical Engineering B ¹	<u>ELE4BME</u>	15
TE-SEM-1	Optical Fibre Communication Systems	<u>ELE4OFC</u>	15
TE-SEM-1	Radio Frequency Design	<u>ELE4RFD</u>	15
TE-SEM-2	Biomedical Engineering ¹	<u>ELE3BIO</u>	15
TE-SEM-2	Digital Communication Systems	<u>ELE3DCS</u>	15
TE-SEM-2	Electronic Design Automation-Tools and Technique	<u>ELE3DDE</u>	15
TE-SEM-2	Image Processing and Coding	<u>ELE4IPC</u>	15
TE-SEM-2	Digital Signal Processing	<u>ELE3SIP</u>	15
TE-SEM-2	Antennas and Propagation	<u>ELE4ANS</u>	15
TE-SEM-2	Clinical Engineering ¹	<u>ELE4CLN</u>	15
TE-SEM-2	Digital Control Theory	<u>ELE4DCT</u>	15
TE-SEM-2	Communications Networks	<u>ELE4NET</u>	15

Key: ¹ Enrolment subject to approval from the course coordinator.

Units offered by other departments

Subject to the approval of the course coordinator students may take a maximum of two units (30 credit points) offered by other departments, if they are of appropriate level and considered relevant to the course.