



Introduction

ELEC1111 Electrical and Telecommunications Engineering

Never Stand Still

Faculty of Engineering

School of Electrical Engineering and Telecommunications

Course Staff

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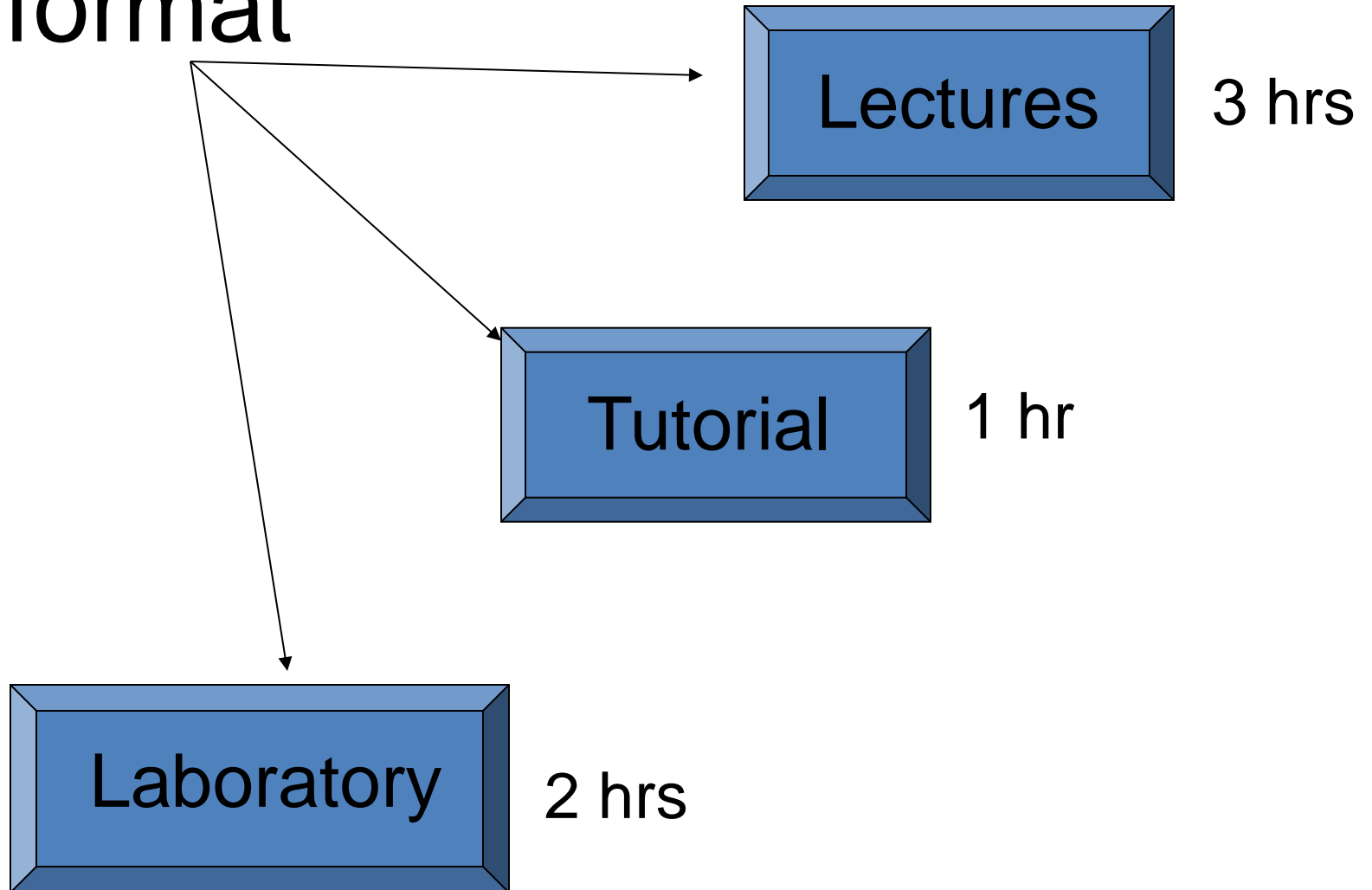
TBA

Contents

- **Administration**
- **Why Electrical Engineering?**

Course format

Every Week

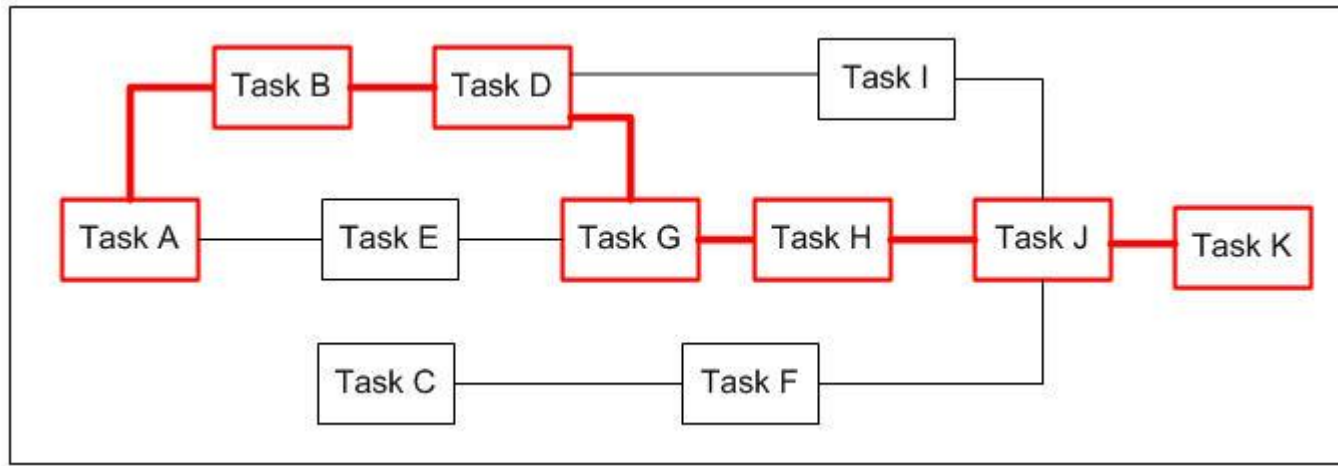


Indicative Course Structure

Wk. No	Summary of Lecture Program
1	Introduction, Circuit Basics Overview + Lab Safety.
2	Kirchhoff's laws - Resistive circuits, Series & Parallel circuits, Power & Energy
3	Node Equations & Circuit analysis
4	Circuit theorems – Thévenin, Norton, Superposition Theorems, MPT
5	Energy storage elements - inductors and capacitors, energy storage
6	First order circuits – RL & RC circuits, transient responses
7	Introduction to AC/sinusoidal analysis, phasors & phasor diagrams
8	Sinusoidal steady-state analysis, AC circuit analysis, AC power analysis
9	Transformers and voltage shaping circuits
10	Operational amplifiers
11	Digital systems, number representation
12	Combination logic, digital circuit analysis

Critical Path

The longest path through a network of interdependent activities



Assumption:
Each task cannot start until all dependent (input) tasks are first completed

Delays in the critical path directly cause delays to the entire duration of the project

ELEC1111 is on the critical path for your degree program

ELEC1111 Lab

Buy the Laboratory kit –

- **COMPULSORY:**
 - \$5- Elec1111 components kit.
- **OPTIONS:**
 - Pay extra \$15 for a prototyping board (useful investment)
 - \$5.5 – Safety Goggles + \$5 soldering kit – not a compulsory experiment

Pay from your student card at School Office in Elec. Eng. Building (room EEG1) or MiniPOS machine at EEG15A for soldering and components kit.

<https://recharge.it.unsw.edu.au/>

Get receipt, pick up goods from the Electronic Workshop (room EEG15A)

Buy the Laboratory book (optional)

- \$10 – pay and get the lab book at school office
- A .pdf version of lab question will be available in Moodle a week before lab time.

ELEC1111 Lab

Important:

- You must complete the **Elec Eng OH&S module** before you start in *any* electrical engineering labs
 - In either this course or other courses
- From Moodle Home, using 'Search courses', find 'Elec Eng OH&S'
- Use enrolment key word 'elec mood'
- You should be able to enrol in and complete the course

LAB

Attend no less than 80% of lab classes and watch safety lecture.

AND

Pass mark average for experiments

AND

Pass lab EXAM (Week 10/11)

Course Total Mark

$$= 0.15 * \text{Ave_of_8_labs} + 0.05 * \text{LabExam} + 0.2 * \text{MidSession} + 0.6 * \text{FinalExam}$$

MUST PASS TO PASS THE COURSE

Tutorials

One hour tutorial weekly

Go to your designated time-slot

What do you do ?

- ✓ Solve problems from textbook, tutorial question and handouts beforehand
- ✓ Contribute to interactive problem solving

What do we do ?

- ✓ Answer your questions
- ✓ Give example worked solutions
- ✓ Tutorial solution available in Moodle a week after

Attendance

Lectures

- UNSW requirement to attend 80% of classes.

Lab

- 80% of lab sessions
- **Reports handed in at end of lab session**

Lab Safety COMPULSORY

Course Web Site

<http://moodle.telt.unsw.edu.au>

You should be automatically enrolled in ELEC1111 on Moodle

You will need your zPass to access this

All marks – lab assessments, midterm test and exams

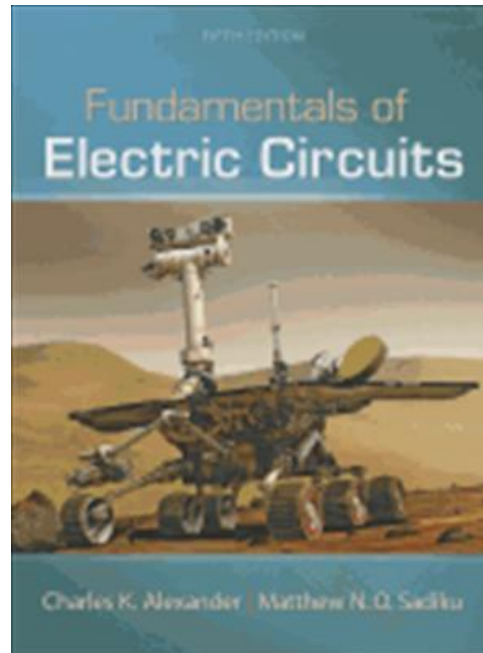
Discussion forums:

- Post your questions, doubts and discussions
- Any student can answer the questions by any other student.
- Only questions related to ELEC1111 need to/should be posted.

Text book

Recommended

- Alexander and Sadiku, Fundamentals of Electric Circuits, recent edition



Others

- Check course outline

Mid-session Exam

Week 7 – usual lecture time, venue to be advised

Topics – All material up to and including end of Week 6.

Weight – 20% of final assessment.

Things to do in Week 1

- Read all the Course Outline.
- Log onto Moodle link
- Register for the OH&S safety module in Moodle, watch the lecture, complete the quiz
- Buy the Laboratory kit at G15A (available from Monday 1st of August)
- Buy the Laboratory book at school office (optional)
- Watch video lecture of lab equipment introductions at <http://eemedia.ee.unsw.edu.au/Laboratory/index.htm>

Need help?

Ask tutor in your tutorial class

Post your question on the Moodle discussion forum

Send me an e-mail (used UNSW email address, “Elec1111....” in title

Use my consultation time: TBA, EE206

Don't wait !

What you can give us!

Feedback

- Both positive and negative
- What you like about the course
- Suggestions for content / improvements

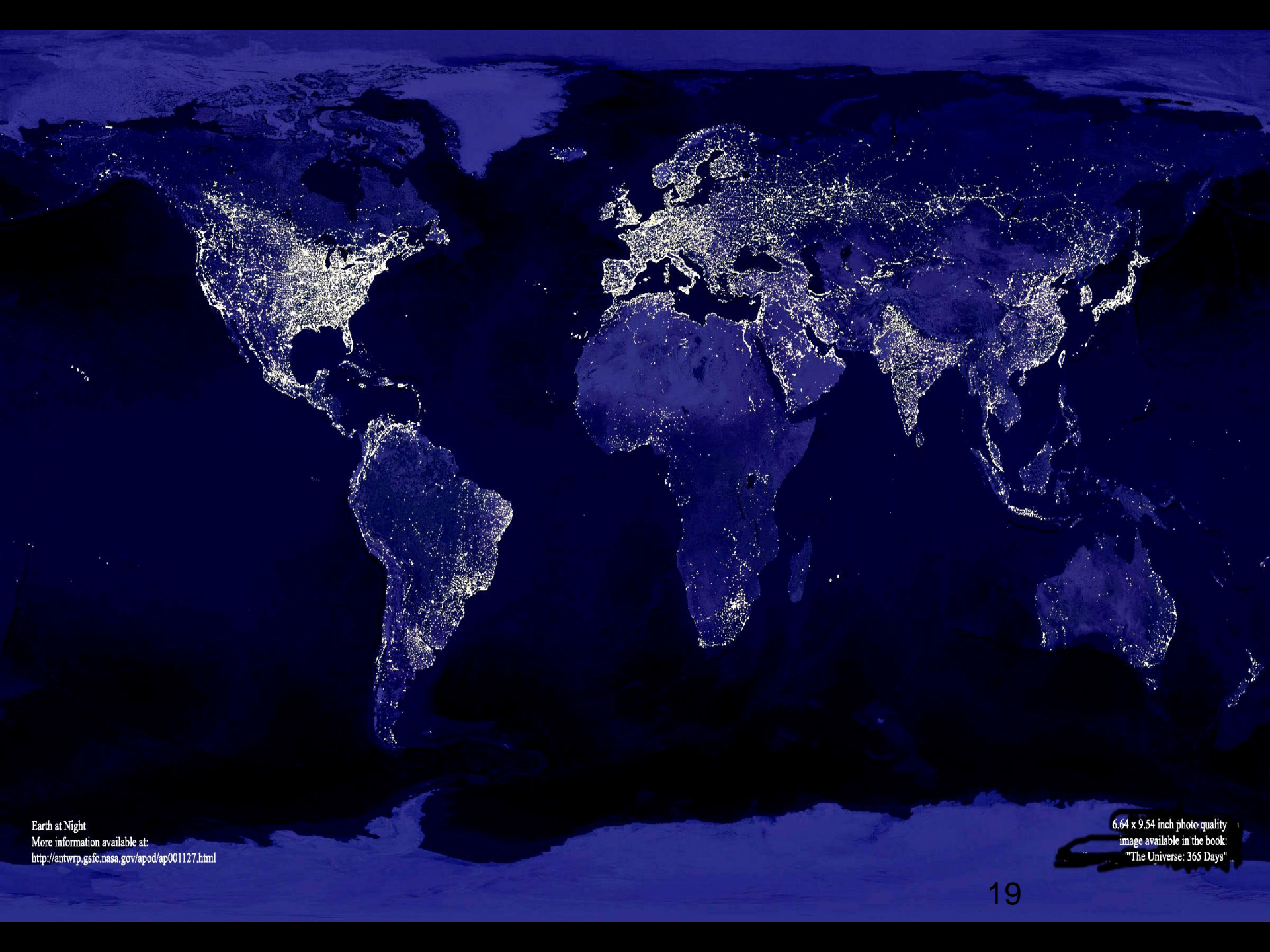
Input

- Contributions on content – good web sites/links to share
- Interesting & challenging problems to solve

Why Electrical Engineering?

How much do we rely on Electrical Systems?

What would the world be like if all electrical systems suddenly stopped working?



Earth at Night
More information available at:
<http://antwrp.gsfc.nasa.gov/apod/ap001127.html>

6.64 x 9.54 inch photo quality
image available in the book:
"The Universe: 365 Days"

Why are you studying this subject?

Electrical systems are an integral part of many modern systems.

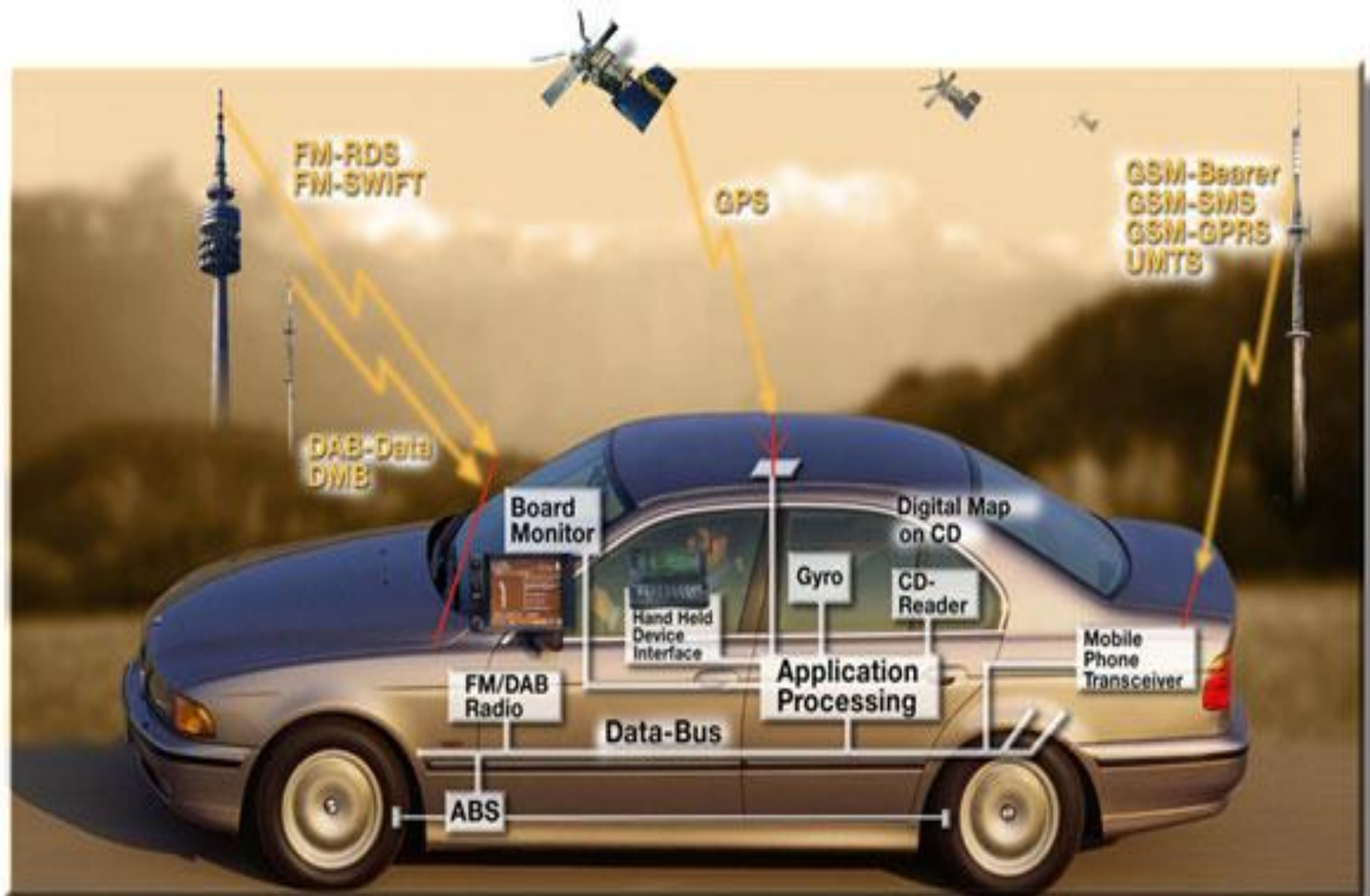
Why Electrical??????

- Fast, efficient way to transmit energy
- Fast, efficient way to communicate information
- Many advances in electrical and electronic systems eg computers and semiconductor systems.
- Small, light weight
- Lot of computing power
- Reliability
- Flexibility

Broader topics

- Electrical (transfer of energy)
 - Power systems
 - Renewable energy
 - Electrical machines
 - Power Electronics
- Electronic (transfer of information)
 - Digital electronics & computing systems
 - Analog electronics
 - Microelectronics
 - Control systems
 - Communication systems
 - Instrumentation/Measurement
 - Telecommunications
 - Signal processing

A Car – the EE perspective

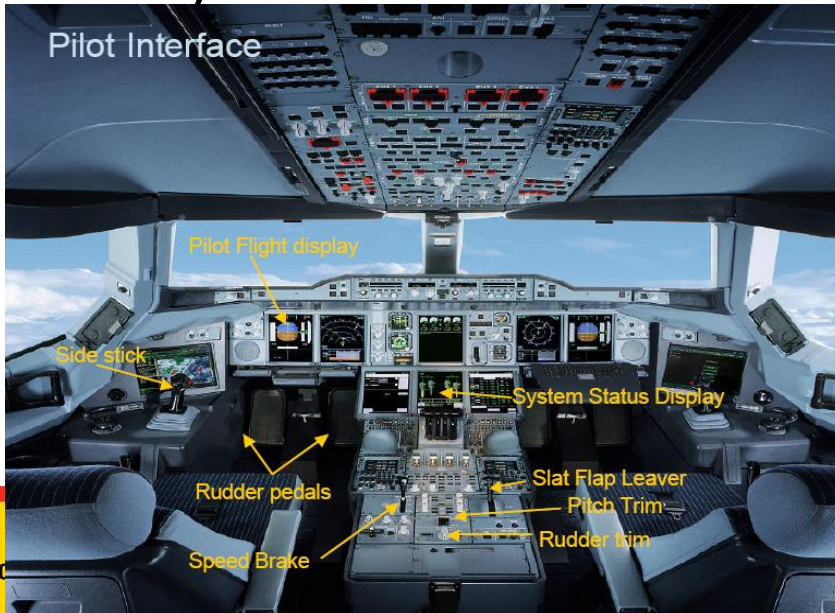


Source: A.S. Sangiovanni-Vincentelli, EE 249, UC Berkeley, Fall 2002.

Airbus 380 vs Boeing Dreamliner

Large Commercial Aircraft contains many electrical systems eg:

- Power systems
- Control Systems
- Communication Systems

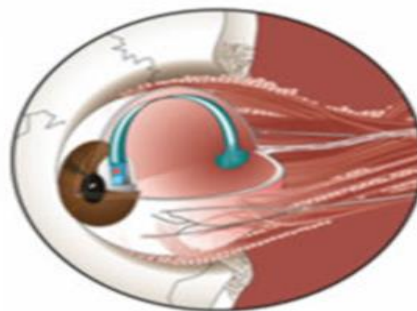
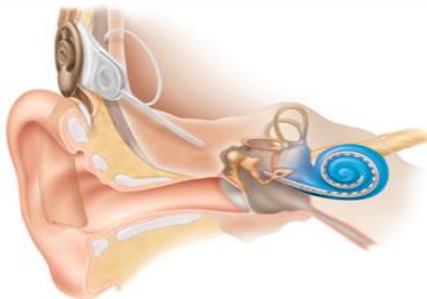
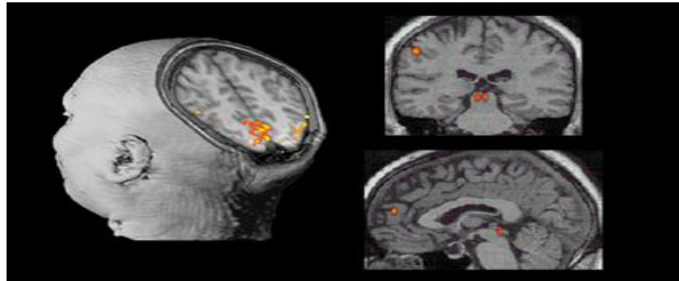


Courtesy: Airbus S.A.S and Boeing

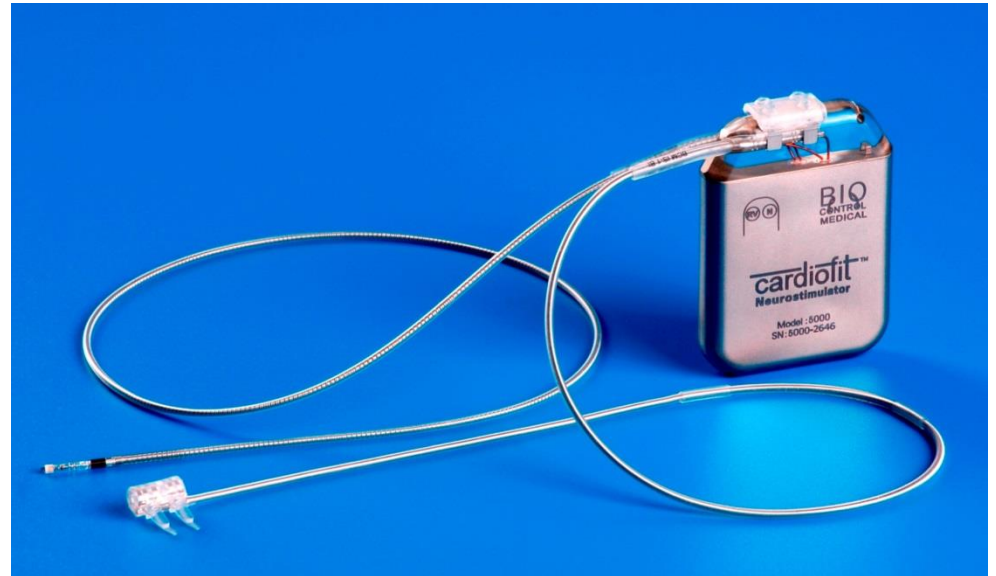
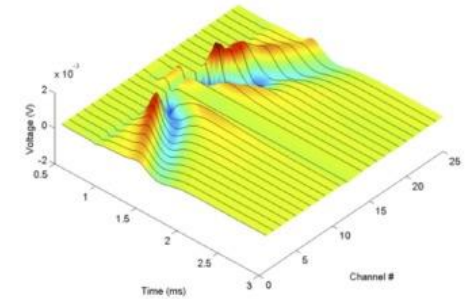
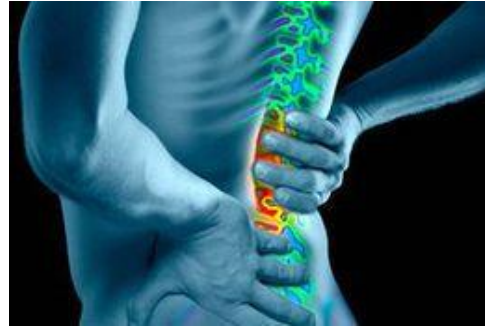
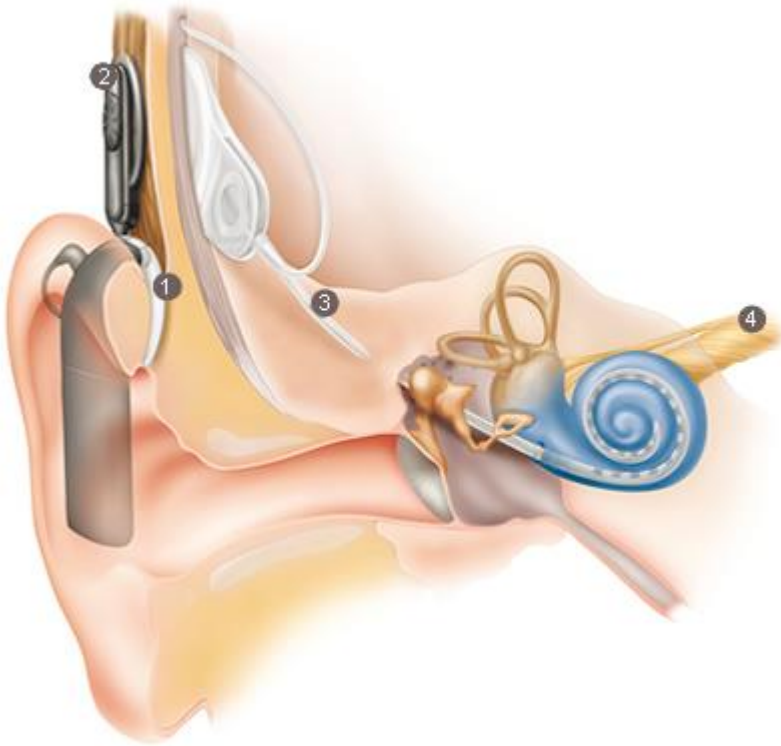


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Medical instrumentation



Medical instrumentation



Your future starts now

- Join professional societies:
 - Engineers Australia
 - Student membership free
- Start researching interesting companies
- Look for opportunities to meet professional engineers
- Get to know other engineering students
- Join a student project
 - BLUEsat
 - sunswift
 - FIRST Robotics
 - Start your own . . . Student Project Seed Funding