



### ELEC 216 – Electricity and Magnetism

Term – Fall 2014 (201409)

#### Instructor

Dr. Jens Bornemann, P.Eng.  
Phone: 250-721-8666  
E-mail: jbornema(at)ece(dot)uvic(dot)ca

#### Office Hours

Days: Monday & Wednesday  
Time: 13:00 – 14:00  
Location: EOW 309

#### Lectures

**A**-Section(s): A02 / CRN 11161  
Days: Mon & Wed  
Time: 14:30 – 15:50  
Location: ECS 125

#### Labs

**Location: ELL 129**

**B**-Section(s)

See the attached schedule for details

#### Tutorials

T-Section(s):	Days	Time	Place
T01: 11176	Tue	13:30 – 14:20	FRA 159
T02: 11177	Thur	16:30 – 17:20	ECS 125

#### Required Text

Title: Fundamentals of Applied Electromagnetics, 6ed, ISBN: 978-0-13-213931-1  
Author: Fawwaz T. Ulaby, Eric Michielssen, Umberto Ravaioli  
Publisher: Pearson / Prentice Hall  
Year: 2010

#### References

Title: Engineering Electromagnetics, 7ed  
Author: W.H. Hayt, J.A. Buck  
Publisher: McGraw-Hill  
Year: 2006

#### Assessment

Assignments:	10%
Labs* <sup>1</sup>	20%
Mid-term* <sup>2</sup>	20%
Final* <sup>2&amp;3</sup>	50%

Date: **Mon 20 October 2014**

#### \*Note

1. Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.
2. Must attend all labs and at least 80% of the lectures in order to qualify to write the midterm and final examinations (<http://web.uvic.ca/calendar2014/FACS/UnIn/UARe/Atte.html>)
3. Students earning less than 45% (less than 22.5 out of 50) in the final exam will fail the course.
4. Plagiarism detection software may be used to aid the instructor and/or TA's in the review and grading of some or all of the work you submit (<http://library.uvic.ca/instruction/cite/plagiarism.html>).

## Due Dates for Assignments

- T.B.A.

## Lab Requirements

- Lab begins on Monday, 08 September 2014.
- See GENERAL LABORATORY REGULATIONS FOR STUDENTS in the lab manual for details about report requirements.

## Final Grade

The final grade obtained from the above marking scheme will be based on the following percentage-to-grade point conversion:

	Grades	Grade Point Value	Percentage for Instructor Use Only	Note
Passing	A+	9	90 – 100	
	A	8	85 – 89	
	A–	7	80 – 84	
	B+	6	77 – 79	
	B	5	73 – 76	
	B–	4	70 – 72	
	C+	3	65 – 69	
	C	2	60 – 64	
	D	1	50 – 59	
Failing	E	0	0 – 49	Fail, conditional supplemental exam*. (For undergraduate courses only)
	F	0	0 – 49	Fail, no supplemental.
	N	0	0 – 49	Did not write examination, lab or otherwise completed course requirements by the end of the term or session; no supplemental exam.

*\*Assignment of E grade will be at the discretion of the Course Instructor.*

The rules for supplemental examinations are found on page 80 of the current 2014/15 Undergraduate Calendar.

Term in which E Grade was obtained:	Application Deadline for Supplemental Exam	Supplemental Exam Date
First term of Winter Session (Sept – Dec)	February 28 in the following term	First week of following May
Second term of Winter Session (Jan – Apr)	June 30 in the following term	First week of following September
Summer Session (May – Aug)	October 31 in the following term	First week of following January

Deferred exams will normally be written at the start of the student's next academic term; i.e., approximately 4 months following the deferral of the exam.

## Course Description

1. **Course Objectives:** Study the fundamentals of electromagnetics with emphasis on engineering applications.
2. **Learning Outcomes:** Upon completion of this course students should be able to:
  - a. Describe the basic properties of electric and magnetic forces.
  - b. Calculate the gradient of a scalar function and the divergence and curl of a vector function in any of the three primary coordinate systems.
  - c. Apply Coulomb's Law, Biot-Savart Law, Gauss' Law, Faraday's Law, Lenz's Law, Lorentz Force, Ampère's Law, and Maxwell's Equations to solve electromagnetic problems.

- d. Calculate the resistance, capacitance, and inductance of electromagnetic structures.
  - e. Apply the phasor-domain technique to analyze steady-state electromagnetic problems.
  - f. Evaluate the magnetic force and torque on a current-carrying structure due to a magnetic field.
3. **Syllabus:** Electric charge, Coulomb's Law, electrostatic forces, electric field, Gauss's Law, electric potential, stored energy. Electric current, conduction in a vacuum and in material media, displacement current, magnetic field of a current, force on a current carrying wire, magnetic induction, electromotive force, energy stored in a magnetic field. Time varying fields. Capacitance, resistance, inductance, and their characterization.

### Note to Students

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the ECE Chair by email or the ECE Chair's Secretary [eceasst@uvic.ca](mailto:eceasst@uvic.ca) to set up an appointment.

### Accommodation of Religious Observance

See <http://web.uvic.ca/calendar2014/GI/GUPo.html>

### Policy on Inclusivity and Diversity

See <http://web.uvic.ca/calendar2014/GI/GUPo.html>

### Standards of Professional Behaviour

You are advised to read the Faculty of Engineering document Standards for Professional Behaviour at <http://www.uvic.ca/engineering/current/undergrad/index.php#section0-25> which contains important information regarding conduct in courses, labs, and in the general use of facilities.

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult <http://web.uvic.ca/calendar2014/FACS/UnIn/UARe/PoAcI.html> for the UVic policy on academic integrity.

**Plagiarism detection software may be used to aid the instructor and/or TA's in the review and grading of some or all of the work you submit.**  
(<http://library.uvic.ca/instruction/cite/plagiarism.html>)

[site map](#) | [help](#) | [exit](#)

## Class Schedule Listing

First Term: Sep - Dec 2014  
Aug 31, 2014

### Sections Found

[ELECTRICITY AND MAGNETISM - 11160 - ELEC 216 - A01](#)Associated Term: First Term: Sep - Dec 2014  
Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, UndergraduateMain Campus  
Lecture Schedule Type  
Face to Face Instructional Method  
1.500 Credits  
[View Catalog Entry](#)

### Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	2:30 pm - 3:50 pm	MW	David Strong Building C103	Sep 03, 2014 - Dec 03, 2014	Lecture	Poman P. So (P)

[ELECTRICITY AND MAGNETISM - 11161 - ELEC 216 - A02](#)Associated Term: First Term: Sep - Dec 2014  
Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, UndergraduateMain Campus  
Lecture Schedule Type  
Face to Face Instructional Method  
1.500 Credits  
[View Catalog Entry](#)

### Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	2:30 pm - 3:50 pm	MW	Engineering Comp Science Bldg 125	Sep 03, 2014 - Dec 03, 2014	Lecture	Jens Bornemann (P)

[ELECTRICITY AND MAGNETISM - 11162 - ELEC 216 - B01](#)Associated Term: First Term: Sep - Dec 2014  
Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, UndergraduateMain Campus  
Lab Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
[View Catalog Entry](#)

### Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
------	------	------	-------	------------	---------------	-------------

Every Week	4:00 pm - 6:50 pm	M	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA
---------------	----------------------	---	-------------------------	--------------------------------	-----	-----

[ELECTRICITY AND MAGNETISM - 11163 - ELEC 216 - B02](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	2:30 pm - 5:20 pm	T	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11164 - ELEC 216 - B03](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	11:30 am - 2:20 pm	W	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11165 - ELEC 216 - B04](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	4:00 pm - 6:50 pm	W	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11166 - ELEC 216 - B05](#)

Associated Term: First Term: Sep - Dec 2014

Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, Undergraduate

Main Campus  
Lab Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
[View Catalog Entry](#)

#### Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	11:30 am - 2:20 pm	Th	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

#### [ELECTRICITY AND MAGNETISM - 11167 - ELEC 216 - B06](#)

Associated Term: First Term: Sep - Dec 2014  
Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, Undergraduate

Main Campus  
Lab Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
[View Catalog Entry](#)

#### Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	2:30 pm - 5:20 pm	F	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

#### [ELECTRICITY AND MAGNETISM - 11168 - ELEC 216 - B07](#)

Associated Term: First Term: Sep - Dec 2014  
Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, Undergraduate

Main Campus  
Lab Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
[View Catalog Entry](#)

#### Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	5:30 pm - 8:20 pm	T	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

#### [ELECTRICITY AND MAGNETISM - 11169 - ELEC 216 - B08](#)

Associated Term: First Term: Sep - Dec 2014  
Registration Dates: Jun 16, 2014 to Sep 19, 2014  
Levels: Law, Undergraduate

Main Campus  
Lab Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	7:00 pm - 9:50 pm	W	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11170 - ELEC 216 - B09](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	6:30 pm - 9:20 pm	Th	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11171 - ELEC 216 - B10](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	7:00 pm - 9:50 pm	M	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11172 - ELEC 216 - B11](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	3:30 pm - 6:20 pm	Th	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11173 - ELEC 216 - B12](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	5:30 pm - 8:20 pm	F	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11174 - ELEC 216 - B13](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Lab Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	11:30 am - 2:20 pm	M	Elliott Building 129	Sep 03, 2014 - Dec 03, 2014	Lab	TBA

[ELECTRICITY AND MAGNETISM - 11176 - ELEC 216 - T01](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus  
 Tutorial Schedule Type  
 Face to Face Instructional Method  
 0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	1:30 pm - 2:20 pm	T	Fraser Building 159	Sep 03, 2014 - Dec 03, 2014	Tutorial	Mostafa Esmaeili (P)

[ELECTRICITY AND MAGNETISM - 11177 - ELEC 216 - T02](#)

Associated Term: First Term: Sep - Dec 2014  
 Registration Dates: Jun 16, 2014 to Sep 19, 2014  
 Levels: Law, Undergraduate

Main Campus



Tutorial Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
[View Catalog Entry](#)

**Scheduled Meeting Times**

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	4:30 pm - 5:20 pm	Th	Engineering Comp Science Bldg 125	Sep 03, 2014 - Dec 03, 2014	Tutorial	Trevor R. Beugeling (P)

Release: 8.5.1