

Course Outline

1. COURSE INFORMATION

Session Offered	Fall 2015	
Course Name	Electrical Power Generation	
Course Code	ENR TECH 3EP3	
Date(s) and Time(s) of lectures	Mondays, 6:30 pm – 9:30 pm	
Program Name	Bachelor of Technology	
Calendar Description	Basic electric circuits, basic electrical theorems, network analysis, phasors, three phase systems, transformers, motors, electric power generation, power plant components (transformers, motors, breakers, synchronous machines)	
Instructor(s)	Dr. Chi Tang	E-Mail: cktang@mcmaster.ca Office Hours & Location: 3 pm to 10 pm, ETB-214

2. COURSE SPECIFICS

Course Description			
Instruction Type	Code	Type	Hours per term
	C	Classroom instruction	36
	L	Laboratory, workshop or fieldwork	12
	T	Tutorial	
	DE	Distance education	
	Total Hours		48
Resources	ISBN	Textbook Title & Edition	Author & Publisher
	ISBN: 9780131776913	Electrical Machines, Drives, and Power Systems, 6 th Edition	Theodore Wildi, Prentice Hall
	Other Supplies	Source	
Prerequisite(s)	Registration in Energy Engineering Technologies		
Corequisite(s)			
Antirequisite(s)			
Course Specific Policies			
Departmental Policies	<p>Students must maintain a GPA of 3.5/12 to continue in the program.</p> <p>In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of “out-of-class” work for every scheduled hour in class. “Out-of-class” work includes reading, research, assignments and preparation for tests and examinations.</p> <p>Where group work is indicated in the course outline, such collaborative work is mandatory.</p> <p>The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception.</p>		

	Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class.	
	Instructor has the right to submit work to software to identify plagiarism.	
3. SUB TOPIC(S)		
Week 1	<ul style="list-style-type: none"> • Course Structure and Outlines • Basic Electric Quantities • Phasor Representation, • Three Phase Power System 	Ch. 1, 2
Week 2	<ul style="list-style-type: none"> • Basic Electric Circuits • Basic Electrical Theorems • Alternating Current Network Analysis 	Ch. 1, 2
Week 3	<ul style="list-style-type: none"> • Single Phase Transformer • Transformer Equivalent Circuit 	Ch. 7, 9
Week 4	<ul style="list-style-type: none"> • Three Phase Transformer • Instrument Transformers 	Ch. 8, 10, 11, 12
Week 5	<ul style="list-style-type: none"> • DC Machines 	Ch. 4, 5
<i>Mid-term recess (Monday, October 12 to Saturday, October 17)</i>		
Week 7	Midterm Exam	
Week 8	<ul style="list-style-type: none"> • Induction Motors • Induction Generators 	Ch. 13
Week 9	<ul style="list-style-type: none"> • Synchronous Machines – Part 1 	Ch. 16, 17
Week 10	<ul style="list-style-type: none"> • Synchronous Machines – Part 2 	Ch. 16, 17
Week 11	<ul style="list-style-type: none"> • Power Plants – Part I Coal-fired Plants Oil-fired Plants Gas-fired Plants (Simple Cycle/Combined Cycle) 	Ch. 24
Week 12	<ul style="list-style-type: none"> • Power Plants – Part II Nuclear Plants Hydro Plants 	Ch. 24
Classes end – Tuesday December 8, 2015		
Final examination period: Wednesday December, 9, 2015 to Tuesday, December 22, 2015		
All examinations MUST BE written during the scheduled examination period.		
List of experiments		
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
<i>Mid-term recess (Monday, October 12 to Saturday, October 17)</i>		
Lab 6		
Lab 7		

Lab 8	
Lab 9	
Lab 10	
Lab 11	
Lab 12	

Note that this structure represents a plan and is subject to adjustment term by term.

The instructor and the University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.

4. ASSESSMENT OF LEARNING *including dates*	Weight
Assignments	10
Mid-term test	30
Project	
Labs	20
Final examination (tests cumulative knowledge)	40
TOTAL	100%

Percentage grades will be converted to letter grades and grade points per the University calendar.

5. LEARNING OUTCOMES

1. Be able to analyse 3-phase circuits as encountered in power generation and distribution
2. Be able to model, analyse, and understand the operating principles of power transformers
3. Be able to model, analyse, and understand the operating principles of DC machines and their roles in power generation
4. Be able to model, analyse, and understand the operating principles of AC machines and their roles in power generation
5. Be able to explain various types of conventional power plants and identify their operating characteristics
6. Be able to explain various types of renewable energy power plants and identify their operating characteristics
7. Develop a good understanding of the Ontario power generation industry

6. POLICIES

Anti-Discrimination

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.

<http://www.mcmaster.ca/policy/General/HR/Anti-Discrimination%20policy.pdf>

Academic Integrity

You are required to exhibit honestly and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences e.g. the grade of zero on

an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, located at: <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>.

The following illustrates only three forms of academic dishonesty:

1. Plagiarism. E.g. the submission of work that is not own or for which other credit has been obtained
2. Improper collaboration in group work
3. Copying or using unauthorized aids in tests and examinations.

Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)

The McMaster Student Absence Form is a self-reporting tool for **Undergraduate Students** to report absences that last up to 3 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period.

You may submit a maximum of 1 Academic Work Missed requests per term. It is YOUR responsibility to follow up with your Instructor immediately regarding the nature of the accommodation.

If you are absent more than 3 days or exceed 1 request per term you **MUST** visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation.

This form should be filled out immediately when you are about to return to class after your absence. <http://www.mcmaster.ca/msaf/>

E-Learning Policy

Consistent with the Bachelor of Technology's policy to utilize e-learning as a complement to traditional classroom instruction, students are expected to obtain appropriate passwords and accounts to access Avenue To Learn for this course. Materials will be posted by class for student download. It is expected that students will avail themselves of these materials prior to class. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail account, and program affiliation may become apparent to all other students in the course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about this disclosure please discuss this with the course instructor. Avenue can be accessed via <http://avenue.mcmaster.ca>.

Communications

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

Turnitin (Optional)

This course will be using a web-based service (Turnitin.com) to reveal plagiarism. Students submit their assignment/work electronically to Turnitin.com where it is checked against the internet, published works and Turnitin's database for similar or identical work. If Turnitin finds similar or identical work that has not been properly cited, a report is sent to the instructor showing the student's work and the original source. The instructor reviews what Turnitin has found and then determines if he/she thinks there is a problem with the work. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to

normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/turnitin/students/>

Protection of Privacy Act (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades and all other personal information at all times. For example, the submission and return of assignments and posting of grades must be done in a manner that ensures confidentiality.

<http://www.mcmaster.ca/univsec/fippa/fippa.cfm>

Academic Accommodation of Students with Disabilities Policy

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information consult McMaster's policy for Academic Accommodation of Students with Disabilities

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

Students must forward a copy of the SAS accommodation to the instructor of each course and to the Program Administrator of the B.Tech. Program immediately upon receipt. If a student with a disability chooses NOT to take advantage of a SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. <http://sas.mcmaster.ca>

Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.

<http://judicialaffairs.mcmaster.ca/pdf/SCC.pdf>