

Course Outline

1. COURSE INFORMATION

Session Offered	Fall 2017	
Course Name	Physics	
Course Code	ENGTECH 1PH3	
Date(s) and Time(s) of lectures	C01: Tuesday 8:30-10:30 & Thursday 9:30-11:20 C02: Tuesday 10:30-12:30 & Thursday 12:30-14:20 C03: Tuesday 15:30-17:20 & Thursday 16:30-18:20 C04: Wednesday 8:30-10:30 & Friday 9:30-11:20	
Program Name	Automotive and Vehicle Technology/ Biotechnology/ Process Automation Technology	
Calendar Description	Sound, light, kinematics, forces, work, energy, fluid and thermal physics.	
Instructor(s)	Reza Ushaksaraei Nicoleta Ladanyi Mandeep Saini Daisy Korah	E-Mail: ushakr@mcmaster.ca E-Mail: ladanyi@mcmaster.ca E-Mail: sainima@mcmaster.ca E-Mail: korahd@mcmaster.ca Office Hours & Location: TBA

2. COURSE SPECIFICS

Course Description	Kinematics in one and two dimensions, forces and Newton's laws of motion, dynamics of uniform circular motion, work and energy, impulse, momentum, simple harmonic motion and elasticity, fluids, temperature and heat, heat transfer, sound, reflection and refraction of light, interference and the wave nature of light.		
Instruction Type	Code	Type	Hours per term
	C	Classroom instruction	52
	L	Laboratory, workshop or fieldwork	12
	T	Tutorial	
	DE	Distance education	
	Total Hours		64
Resources	ISBN	Textbook Title & Edition	Author & Publisher
	9 th Ed: 978-0-470-87952-8 8 th Ed: 978-0-470-22355-0 7 th Ed: 978-0-471-66315-7	Physics, 10 th Edition, 9 th Edition, 8 th Edition or 7 th Edition	Cutnell & Johnson, Wiley Publication
	978-0-666-33107-6	Physics Lab Manual	McMaster University
	Other Supplies	Source	
	Lab coat and safety glasses	McMaster Bookstore	
Prerequisite(s)	Registration in B.Tech. I.		
Corequisite(s)	None		
Antirequisite(s)	None		
Course Specific Policies	<p>Students must pass both Theory and Lab components (50% minimum) for passing this course.</p> <p>Regular attendance and active participation in all classroom sessions are essential for success in this course.</p> <p>Formal lab reports are to be submitted for all laboratories completed.</p>		

	<p>It is the student's responsibility to make up work for missed lectures and laboratories.</p> <p>Late lab reports will not be accepted.</p> <p>All work must be shown to get full credit.</p> <p>Rewrites for missed tests, quizzes and examinations will only be allowed for medical or compassionate reasons, and supporting documentation must be provided.</p>	
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> <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.</p> <p>Instructor has the right to submit work to software to identify plagiarism.</p>	
3. SUB TOPIC(S)		
Week 1	<p>Introduction to mathematical concepts</p> <p>Units and dimensional analysis.</p> <p>Mathematical concepts.</p> <p>Vectors and scalars. Vector addition and subtraction.</p>	Chapter 1
Week 2	<p>Kinematics in one dimension</p> <p>Displacement, speed and velocity, acceleration.</p> <p>Kinematics in two dimensions</p> <p>Projective motion.</p>	Chapter 2 Chapter 3
Week 3	<p><u>Quiz#1</u></p> <p>Force and Newton's laws of motion</p> <p>Force and mass. Newton's laws of motion. Gravitational force.</p> <p>Normal force. Static and dynamic friction forces. Tension force.</p> <p>Forces in equilibrium and unbalanced forces.</p>	Chapter 4
Week 4	<p><u>Quiz#2</u></p> <p>Dynamics of uniform circular motion</p> <p>Dynamics of uniform circular motion (horizontal and vertical).</p> <p>Centripetal acceleration. Banked curves.</p> <p>Satellites in circular orbits. Weightlessness and artificial gravity.</p>	Chapter 5
Week 5	<p><u>Term test#1</u></p> <p>Work and energy</p> <p>Work. Kinetic and potential energy. Conservative and nonconservative forces. Conservation of mechanical energy.</p> <p>Work –energy theorem.</p>	<u>Chapters#1-5</u> Chapter 6
Mid-term Recess: Monday, October 9 th to Sunday, October 15 th , 2017		
Week 7	<p>Impulse and momentum</p> <p>Impulse and momentum.</p> <p>Conservation of linear momentum.</p>	Chapter 7

Week 8	<u>Quiz#4</u> Fluids Fluid statics. Mass density and pressure. Pascal's principle. Archimede's principle. Fluids dynamics. Equation of continuity. Bernoulli's principle. Viscous flow.	Chapter 11
Week 9	<u>Term test#2</u> Temperature and heat Temperature. Linear and volume thermal expansion. Heat and internal energy. Specific and latent heat. Humidity.	<u>Chapters 6,7,10,11</u> Chapter 12
Week 10	Transfer of heat Convection, Conduction and radiation.	Chapter 13
Week 11	<u>Quiz#5</u> Waves and sound Nature of waves. Transverse, longitudinal, periodic waves. Nature of sound. Speed, level and intensity. Doppler effect.	Chapter 16
Week 12	Reflection of light: Mirrors Reflection of light. Spherical mirrors. Mirror equation. Refraction of light: Lenses and optical instruments Refraction of light. Snell's law. Total internal reflection. Lenses. Lens equation. Interference and the wave nature of light. Interference of light.	Chapter 25 Chapter 26 Chapter 27
Week 13	<i>Review.</i>	
<p>Classes end: Wednesday, December 6, 2017 Final examination period: Friday, December 8 to Thursday, December 21, 2017 All examinations MUST be written during the scheduled examination period.</p> <p>FINAL EXAMINATIONS will be scheduled, conducted and invigilated by the Office of the Registrar. All students entering the examination room must produce a McMaster photo identification card. No other identification will be accepted. In addition, for classes that allow you to use a calculator, you must use the "CASIO FX 991" during all tests and exams. The CASIO FX 991, is the only calculator allowed in the exam room.</p>		
List of experiments { labs are conducted Every Other Week }		
Lab 1	Vectors	
Lab 2	Force and Acceleration	
Lab 3	Simple Pendulum	
Lab 4	Archimede's Principle	
Lab 5	Latent Heat	
Lab 6	Ray Optics	
<p>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.</p>		
4. ASSESSMENT OF LEARNING *including dates*		Weight
Quizzes (TBA)		15
Mid-term test 1 (TBA)		20
Mid-term test 2 (TBA)		20
Labs		15
Final examination (tests cumulative knowledge) (TBA)		30
TOTAL		100%
Percentage grades will be converted to letter grades and grade points per the University calendar.		
5. LEARNING OUTCOMES		

1. Apply kinematic principles in one and two dimensions using equations that involve position, velocity and acceleration, and time.
2. Use Newton's laws to study the static equilibrium, the dynamic of a single particle, and systems of two or more objects, perform calculations related to static and kinematic force and friction.
3. Identify work, energy, impulse and momentum, solve problems that call for application both of conservation of energy and Newton's laws.
4. Define density and pressure, explain Pascal and Archimede's principles, apply them in the study of fluids, solve applications that involve buoyancy, and apply fluid flow continuity and Bernoulli's equation to fluids in motion.
5. Define appropriate terms and apply formulas related to temperature, thermal expansion, specific and latent heat and heat transfer.
6. Describe the nature of waves and sound and complete related calculations using appropriate formulas for different types of wave propagation. Recognize the wave nature of light, perform calculations on the reflection, refraction and interference of light, understand the principles used to build mirrors and lenses used in technology applications and solve problems related to constructive or destructive interference.

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/Discrimination_Harassment_Sexual_Harassment-Prevention&Response.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 an on-line self-reporting tool for Undergraduate Students to report absences for:

- 1) Relief for missed academic work worth less than 25% of the final grade resulting from medical or personal situations lasting up to three calendar days:
 - Students may submit a maximum of one academic work missed request per term. It is the responsibility of the student to follow up with instructors immediately (within the 3 day period that is specified in the MSAF) regarding the nature of the accommodation. All work due in that time period however can be covered by one MSAF.
 - MSAF cannot be used to meet religious obligation or celebration of an important religious holiday, for that has already been completed or attempted or to apply for relief for any final examination or its equivalent.

- 2) For medical or personal situations lasting more than three calendar days, and/or for missed academic work worth 25% or more of the final grade, and/or for any request for relief in a term where the MSAF has not been used previously in that term:

Students must visit their Associate Dean's Office (Faculty Office) and provide supporting documentation.

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. McMasterUniversity 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 McMasterUniversity.

<http://judicialaffairs.mcmaster.ca/pdf/SCC.pdf> and <http://www.mcmaster.ca/policy/Students-AcademicStudies/StudentCode.pdf>