PHYSICS 1101 – INTRODUCTION TO PHYSICS I
COURSE SYLLABUS

1. COURSE DESCRIPTION

Physics 1101 – Introduction to Physics I (3 lecture hours, 3 laboratory hours, 0.5 course): An introductory algebra-based course in physics covering the foundation principles of kinematics, forces, conservation of energy and momentum, torque, equilibrium, geometric optics and optical instruments. Fundamental physics concepts are introduced with examples from biological applications.

Pre- or Co-requisites: Grade 12U Advanced Functions (MHF4U) or Mathematics 0110A/B.

Anti-requisites: Physics 1201A/B, Physics 1401A/B, Physics 1501A/B, the former Physics 1028A/B, the former Physics 1301A/B.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to meet the necessary requisites.

2. COURSE OBJECTIVES

- Develop basic understanding of fundamental physics concepts related to linear and rotational motion and equilibrium, work and conservation of energy, momentum, and geometric optics.
- Develop problem-solving and critical-thinking skills.
- Read and interpret problems related to physical principles and to apply the correct physical principles to determine the requested quantities.
- Understand and apply various physics concepts in relation to biological models or processes.
- Engage in critical analysis of a problem individually and through team effort, effectively communicating your approach to others through lab reports, forums, and in-class peer instruction.

3. COURSE LEARNING OUTCOMES

By the end of the course, students will be expected to meet the specific learning outcomes identified in the course document *Learning Objectives and Outcomes*. Use the document as a checklist to ensure complete coverage and understanding of the required topics or skills.

Land Acknowledgement

Western University is situated on the traditional territories of the Anishinaabeg, Haudenosaunee, Lunaapeewak and Attawandaron peoples, who have longstanding relationships to the land and region of southwestern Ontario and the City of London. The local First Nation communities of this area include Chippewas of the Thames First Nation, Oneida Nation of the Thames, and Munsee Delaware Nation. In the region, there are eleven First Nation communities and a growing Indigenous urban population.

Western values the significant historical and contemporary contributions of local and regional First Nations and all of the Original peoples of Turtle Island (North America).

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4. INSTRUCTIONAL TEAM

Course Instructor

Dr. Tamie Poepping
Associate Professor, Department of Physics and Astronomy
Physics and Astronomy Building (PAB), PAB236

Zoom Office Hours Wednesdays 1:30-2:30 p.m. on Zoom via link on OWL course Overview. You will need to use your UWO email when registering on Zoom to access the zoom meeting

Course Administrator

Dr. Maryam Tabeshian
Department of Physics & Astronomy

Lab Instructor

Dr. Shailesh Nene, Department of Physics and Astronomy
Material Science Addition (MSA), MSA-2203

Contact Info

1. For all **confidential queries**, please use our course help desk: https://help.sci.uwo.ca/servicedesk/customer/portal/8
See the '*Contact Course Team*' button on OWL. Based on your input, he system will automatically route your question to the most appropriate person on our instructional team.
Note: We will ***not*** respond to:

- email to our personal email addresses;
- email from addresses other than your UWO email account **(@uwo.ca**) as we cannot ensure the legitimacy of the sender from other sources; also, emails from other sources often won't make it through the UWO spam filter.

2. Post **administrative** or **technical** questions on the relevant forums on the course OWL site.

3. Post **physics** questions under the relevant chat group topic on the Perusall site, where you will do you collaborative reading assignments.

5. COURSE DELIVERY

Lectures: 3 lecture hours per week – Mon/Wed/Fri 11:30 AM - 12:20 PM, in AHB-1R40.

The Online Western Learning (OWL) system at http://owl.uwo.ca will be the home base and launching platform for all learning components. Students are responsible for checking the course OWL site on a regular basis. This is the primary method by which information will be disseminated to all students in the class outside of in-person lectures. Log in using your UWO username and password, then find the PHYSICS 1101A 001 FW21 OWL site. Key buttons or tabs to explore:

- ***Getting Started***: This starting point will introduce key elements of the course structure, such as the Course Outline, Labs, book access, and the tools being used (TopHat, Perusall, and JIRA).
- ***Announcements***: important notices and reminders will be posted here. You can set your Preferences (menu beside your name in top banner) to send an email daily or for each posting.
- ***Forums***: for getting help on Administrative and Technical issues.
- ***Gradebook***: Grades for all course evaluation components will be posted here. Grades from external sites (TopHat, Gradescope, Perusall) will be imported about 2-3 times during the term.

If students need assistance on technical issues in OWL, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk, which can be contacted by phone at 519-661-3800 or ext. 83800.

TopHat platform: TopHat will be the primary source for the learning material including e-book, lesson modules, assignments, quizzes (except lab quizzes on OWL), lab manuals, and in-class polling tool for interactive feedback during class time.

Perusall: Perusall is your e-book platform with collaborative annotation assignments where you can read and collectively discuss the course material with your peers as we progress through the course. Use the Chat board to post physics-related questions under the appropriate topic, so that everyone can collectively benefit from (and contribute to) the discussion.

Laboratories: 3 hour labs approximately every two weeks; see Course Schedule for details.

- There will be 1 online lab (Measurements quiz) + 4 laboratory experiments during the Fall term.
- The Lab tabs on OWL (see below) will be the primary source for all details related to the labs.
- Direct all lab-related questions to the lab instructor, Dr. Shailesh Nene via physlab1@uwo.ca.
- Each lab section (004 to 006) is divided into 2 subsections (C and D). On OWL, under Getting Started, you will find your lab schedule and section assignments. You must attend your assigned subsection room.
- Labs are located on the second floor of the Materials Science Addition (MSA) building. See Western's campus maps if needed.
- The complete lab manual is available for reading in your **TopHat** platform. The worksheets are also posted as individual sets for each lab so they can be downloaded.
- **Lab worksheets:** download the lab worksheets from TopHat. These can be completed electronically, or alternatively printed, completed, and scanned (or photographed), for submission via the Gradescope link on OWL. Worksheets should be submitted before the end of your lab session; if necessary you have until the end of the following Sunday as indicated on GradeScope, but no late submissions will be accepted.
- **Pre-lab quiz on OWL**: for each experiment lab, read the manual and complete the corresponding pre-lab quiz on OWL *before* proceeding to the lab session. You need a quiz score of ≥75% but have unlimited attempts. Failure to meet this requirement will lead to zero on the lab, irrespective of the mark you receive for the lab worksheet.
- The first **Measurements & Uncertainties Lab (Lab 01)** is an exception – after reading the lab manual and working through the exercises, complete the online OWL quiz; no worksheets need to be submitted. You need a quiz score of ≥75% to pass. You have 3 attempts with no time limit.

Drop-in Physics Help Centre: Help on course topics will be available on various days as per the schedule posted on OWL when it becomes available. We will strive to find a selection of times to enable access for everyone. The teaching assistants (TAs) in the Help Centre are physics and astronomy graduate students or volunteer undergraduate students specializing in physics (organized by the Physics & Astronomy Student Association, PASA). The drop-in location is in the new Math Hub in the basement of the Physics and Astronomy Building (PAB).

Contingency plan for an in-person class pivoting to 100% online learning*:* In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

6. COURSE MATERIAL

Visit The Book Store at Western (UCC Lower Level or online at https://bookstore.uwo.ca). To find your course material, go to our OWL Getting Started tab, follow the link for 'Book Access'. This will bring up a personal list of materials for your registered courses. Purchase the course e-code bundle for Physics 1101. The full-price version provides lifetime access to the course content; Physics 1102 in the second/winter term will use the same platforms and will not require a separate purchase. There is a six-month option (~$100) by special request at the bookstore if you only plan to take one term of physics, but beware this cannot be extended later if you decide to take Physics 1102.

The course package will provide access to the textbook and learning platforms:

e-book ***Physics: An Algebra-Based Approach (2nd Ed.),*** by O'Meara et al. The text is a resource for assigned readings and homework problems (see Course Schedule). Your purchase will include digital access to the book in two locations: Perusall, for collaborative reading and discussion, and TopHat, for problem-solving assignments and quizzes.

TopHat Access to TopHat is *required* for completing the online assignments and quizzes. See the '*TopHat Instructions'* document on OWL under the *Getting Started* tab.

Perusall Access to Perusall is required for completing pre-lecture readings and discussion assignments.

Lab Manual ***Physics Laboratory Manual 2021-2022 for Physics 1101*** *(required).* The lab manual is included in your package and accessible through the TopHat platform.

Follow the instructions from your bookstore receipt to redeem the bookstore code; this will generate your two access codes for TopHat and Perusall. To access your digital materials, you will need to follow the corresponding TopHat and Perusall links in the course OWL site and then enter the appropriate access codes when prompted.

- **TopHat:** On OWL, follow the TopHat button. You will need to register using your Western email address, the course ID (**066837**), and your purchased access code. Follow the steps carefully in the PDF posted on OWL under *Getting Started*, ensuring that you redeem the bookstore receipt code to obtain the actual TopHat access code. Failure to use your Western email address will result in no grades given to your assignments and quizzes. If you have issues accessing TopHat, contact Support on the TopHat site or visit the related thread on the OWL forum.
- **Perusall:** On OWL, select the Perusall button. Then in *Perusall*, the first time you click on the book ***Physics: An Algebra-Based Approach*** in the Perusall Library or on a reading assignment from the e-book in Perusall, you will be prompted to purchase access to the book. Click "*Enter an access code*" in the top bar, and then enter the access code you received after redeeming the bookstore code. If you have issues, refer to the OWL forum on 'Technical issues' or use the "? Help" button in the top banner in Perusall. *Do not purchase the e-book directly through Perusall, as we have negotiated a bundled discount and you need the other items in the bookstore bundle.*

7. COURSE EVALUATION

The overall course grade will be calculated as follows:

Weekly Reading & Discussion Posts	5%	• Best 10 of 12 weeks counted; completed on Perusall.
Assignments	5%	• Best 5 of 6; completed on TopHat.
Tutorials	3%	• 4 total; participation required for 3 of 4.
Labs	10%	• 5 total; see below for further details.
Quizzes	6%	• Best 3 of 4; see course schedule.
Midterm Test	31%	• In-person; Saturday October 23, 9:00 AM-12:00 PM
Final Examination	40%	• Date & time to be announced by Registrar's Office.

See the document ***Physics 1101 Course Schedule*** for details of timelines and deadlines.

Weekly reading & discussion assignments on Perusall: Weekly assignments involve collaborative readings of the course e-book (or other posted text/video content) in Perusall, followed by posting comments and/or responses to stimulate discussion. Follow the Perusall link in OWL, and then find Assignments in the left sidebar in Perusall. One of the first assignments is on '*How Perusall Works*'.

Assignments on TopHat: 6 assignments are to be completed to help you gain deeper understanding of physics concepts and problem-solving. Your best 5 of 6 scores will be counted.

Tutorials: Students are required to attend and participate in the tutorials, which complement the labs and will occur in the week prior to each experimental lab (2 to 5); see the Course Schedule. The tutorials will focus on developing computational skills and collaborative problem solving. Your tutorial grade will be based on participation including working code from your group at the end of the tutorial.

Labs: This course is listed as a lab-component course, and thus *to pass the course, a student **must** obtain a passing grade for the laboratory component.*

- Students are required to complete **all 4 experiment labs plus the online Measurements Lab (quiz)**. The final lab mark will be the average of the 5 marks. An incomplete or failed lab will be recorded as a zero and included in your lab average score. One lab may be missed with appropriate documentation (see Academic Considerations and Academic policies below).

***Quizzes on TopHat*:** Your understanding of the course content will be assessed over the term through 4 quizzes available on TopHat. The quizzes are timed assessments to provide practice problem solving under a time constraint as will be applicable for the midterm test and final exam.

- ***Quiz dates:*** Wednesdays 8:00 a.m.–8:00 p.m.; Sept. 29, Nov. 10, Nov. 24, Dec. 9.
- Each will be available for a 12-hour window on the dates shown above. You will have one hour to complete a quiz once you have started. *Do not open the quiz until you are ready to take the full quiz*.
- You are expected to work independently on the quiz. Communicating contents of the quizzes to others in any fashion (verbally, via social media, email, printouts, or any other means) or working collaboratively is considered cheating; see 10.B below regarding cheating.

Midterm test: The midterm test will be in-person on Saturday Oct. 23, 9:00 a.m. to 12:00 p.m. (noon). A formula sheet will be provided and available for preview in advance. A calculator will be allowed.

Final examination: The final exam will be in-person. The date and time will be determined and announced by the Office of the Registrar in November. A formula sheet will be provided and available for preview in advance. A calculator will be allowed.

Grades: *All scores* will be transferred to the Gradebook on OWL. Any errors, or appeals to your scores, must be reported to your instructor (via physics1101@uwo.ca) *within two weeks* of their initial posting. *Please note*: *a*) your *final exam* mark will only be posted to OWL after the end of the exam period, *b*) your *final course grade* must come officially from the Registrar's Office and will not be posted on OWL, and *c*) *final course grades* may need to be adjusted in order to conform to department policy.

8. ACADEMIC CONSIDERATIONS

Academic Consideration for Student Absence — Students who experience an extenuating circumstance (illness, injury, or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

(i) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:
- an absence must be no more than 48 hours in duration;
- the assessments must be worth no more than 30% of the student's final grade (For Physics 1101, this means an SRA cannot be used for the midterm test, final exam, or make-up test/exam);
- no more than two SRAs may be submitted during the academic year.

(ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.

(iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors (via physics1101@uwo.ca) within 24 hours of the end of the period covered. Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. *All documentation required for*

absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a ***student's Home Faculty****.*

Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation and visit the Faculty of Science website on Academic Consideration. For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:
www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf
and for the Student Medical Certificate (SMC), see:
www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Religious Accommodation – Students should consult the University's list of recognized religious holidays and give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar.

9. ACCOMMODATION AND ACCESSIBILITY

Students with disabilities should work with Western's Accessible Education (formerly Services for Students with Disabilities, SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. For more information, refer to the Academic Accommodation for Students with Disabilities policy.

10. ACADEMIC POLICIES

Please refer to the UWO Academic Policies http://www.uwo.ca/univsec/academic_policies/ for further details on the policies in practice here. The website for Registrarial Services is www.registrar.uwo.ca.

In accordance with policy, www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

A. Make-up Policy

a) ***Weekly reading assignments*** – As the weekly readings are to prepare for the week's material, no makeup content will be available. The best 10 of 12 weekly scores are counted, which allows you to miss 2 weeks of contributing to the reading discussions without penalty.
b) ***Assignments*** – 6 assignments will be available online over the course term; the best 5 of 6 are counted, thus your lowest mark will be dropped, which allows you to miss 1 assignment without penalty – preserve and apply it wisely as no make-up assignments will be given.
c) ***Labs*** – No makeup labs are offered; however, one lab may be missed with appropriate documentation or self-reported absence (see Academic Considerations above). In all other cases, an incomplete lab will be recorded as a zero and included in your lab average score.
d) ***Tutorials*** – Attendance and participation is required for at least 3 of the 4 tutorials, which allows you to miss 1 tutorial without penalty; no make-up tutorials will be given, and further absences will be recorded as a zero and included in your average score.
e) ***Quizzes*** – 4 quizzes are scheduled over the course term; the best 3 of 4 are counted, thus your lowest mark will be dropped, which allows you to miss 1 quiz without penalty.
f) ***Midterm test*** – A make-up midterm test will be offered **Thursday, October 28, 7:00 PM – 10:00 PM** for those with approved Academic Consideration. You may ***not*** use a self-reported absence for the midterm test as it is worth >30% of your final grade. If the make-up test is also missed due to an approved absence, the grade component will be reweighted to the Final Exam.
g) ***Final Examination*** – In accordance with Senate Policy, a Special Examination will be held within thirty days of the regular final examination for students who were unable to write the regular examination for medical or other documented reasons. Requests for such a Special Examination must be made to the Associate Dean, Faculty of Science via an Academic Counsellor. Note that if you fail to write the scheduled Special Examination, permission to write another Special

Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered (e.g., the following December for this course).

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately (via physics1101@uwo.ca). It is the student's responsibility to make alternative arrangements with their instructor once academic consideration has been approved and the instructor has been informed. In the event of a missed final exam, a "*Recommendation of Special Examination*" form must be obtained from the Dean's Office immediately. For further information, see http://www.uwo.ca/sci/undergrad/academic_counselling/.

B. Cheating and Plagiarism

"Success (and failure) will come and go, but integrity is forever" - Amy Rees Anderson

What is Academic Integrity? Please review this site (from the Centre for Teaching and Learning) and course OWL tab on **Academic Integrity** – your learning should matter to you!

University Policy states that cheating, including plagiarism, is a major scholastic offence. Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following: www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning.

As per the UWO Academic Policies:

- Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing, such as footnotes or citations.
- All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).
- Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

C. Online Course Conduct & Netiquette:

Note that disruptive behaviour of any type during classes or online components, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a session or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

Only students using their UWO credentials will be permitted to access the course elements. If, for privacy reasons, you wish to use a pseudonym, you must have the pseudonym pre-approved by the course coordinator before being allowed to participate in any online component.

If you are experiencing any online harassment or bullying through the course platforms, report the behaviour immediately to your instructor. Perusall has a built-in option (look for the exclamation icon) to flag inappropriate comments or plagiarized content with automatic notification sent to the instructor. Anyone posting inappropriate content or abusing the option to flag inappropriate content will be

banned from further interactions, which eliminates any further grades or marks related to the collaborative platforms.

General considerations of "netiquette":

- Use your computer and/or laptop if possible (as opposed to a cell phone or tablet).
- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. "Flaming" is never appropriate.
- Be professional and scholarly in all online postings. Use proper grammar and spelling. Cite the ideas of others appropriately.

D. Remote Proctoring Software In the event of a health-related lock-down, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring site: remoteproctoring.uwo.ca/.

E. Complaints and Suggestions: If you have a concern about something, please let us know. We rely on your feedback. Please contact initially the person most directly concerned – this will usually be your instructor. If that is not satisfactory, or if there is something more general bothering you, talk it over with the Physics & Astronomy Department Chair or the Associate Chair of Undergraduate Affairs (for contact information see http://www.physics.uwo.ca).

11. SUPPORT SERVICES

Accessibility — Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: www.uwo.ca/se/digital/.

Counseling — Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/

Learning Skills — Learning-skills counsellors at the Student Development Centre (www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Mental Health — Students who are in emotional/mental distress should refer to Mental Health @Western (www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Science Student Donation Fund — This course gratefully acknowledges support from the Science Student Donation Fund. If you are a B.Sc. or B.M.Sc. student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you contribute to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of lab equipment integral to teaching this course. However, you may opt out of the Fee by the end of September of each academic year by completing the online form

linked from the Faculty of Science's Academic Counselling site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the chair of the department or email the Science Students' Council at ssc@uwo.ca. In the front pages of your lab manual, you will find examples of some the lab equipment partially funded through the Science Student Donation Fund.

Student Council — Additional student-run support services are offered by the USC, westernusc.ca/your-services/#studentservices.

COURSE SCHEDULE FALL 2021

	Week	DATE	CHAPTER	TOPIC	READING (prep reading; due before Monday class)	SUGGESTED PRACTICE PROBLEMS (Chapter number indicated at start in bold. For answers, see 'Answers to Exercises & Questions' on TopHat)	ASSIGNMENT (due Sunday 23:55, except where noted)	QUIZ / TEST (Quiz: 1-hr limit; open Mon. 06:00, due Wed. 23:55)	TEAM TACKLE COMPUTATIONAL SKILLS TUTORIAL	LABS (pre-lab quiz on OWL due BEFORE lab)
		Sept 8-10, 2021		**Welcome - Course Intro**	*Syllabus*					
				Measurements	1.1-1.5	**1**-26,39,73				
MOTION & FORCES	**1**	Sept 13-17	Kinematics: 1-D Motion	Position, velocity, acceleration (PVA)	2.1-2.2	**2**-1,5,13,17,53,59	**Assign #1 (due Sun. Sept. 26, 23:55) Kinematics**			**1. Measurements & Uncertainties Lab** (complete OWL quiz)
				Constant acceleration & kinematic equations	2.3-2.5	**2**-21,77,90				
				Acceleration due to gravity		**2**-33,35,37,41,51,97,99				
	2	Sept 20-24	Kinematics: 2-D Motion	Vectors (incl. trig), 2-D velocity, acceleration	3.1-3.4, 4.1-4.2	**2**-77; **3**-9,11,13,18,25,21; **4**-4,7,11,49,53				Lab Schedule updated with sub-sections assigned
				Constant acceleration (kinematic equations),	4.3-4.4	**4**-13,15,19,21,23				
				Uniform circular motion	4.5	**4**-27,30,31,57,85				
	3	Sept 27-Oct 1	Dynamics: Newton's Laws	Forces & Newton's 2nd Law	5.1-5.3	**5**-11,29,45,47,49	**Assign #2 (due Sun. Oct. 10, 23:55) Dynamics & Forces**	**Quiz #1 (Wed Sept 29) on Assign 1**	**PVA**	
				Newton's 1st Law	5.4-5.6	**5**-43,59				Pre-lab Quiz on OWL
				Newton's 3rd Law	5.7	**5**-73,83,113				
	4	Oct 4-8	Dynamics: Applying Newton's Laws	Friction	6.1	**6**-5,11,49				**2. PVA lab**
				Circular Motion & Centripetal Acceleration	4.5, 6.2	**4**-71; **6**-17,21,37				
ENERGY			Work & Energy	Work	7.1	**7**-3,19,87				
	5	Oct 11	*THANKSGIVING*							
		Oct 12-15	Work & Energy	Kinetic Energy, & Work-energy theorem	7.2	**7**-29,31	**Assign #3 (due Wed. Oct. 20, 23:55) Work & Energy**			
				Potential Energy, Conservation of Energy	7.3-7.4	**7**-37,39,43,47,61				
	6	Oct 18-22	Work & Energy	Conservative & non-conservative forces	7.5	**7**-51,53			**Work & Energy**	
MOMENTUM			Momentum	Momentum, Impulse	8.1-8.2	**8**-9				Pre-lab Quiz on OWL
				MIDTERM REVIEW			**Assign #4 (due Sun. Nov. 7, 23:55) Momentum & Collisions**	**Midterm Test - Sat Oct 23**		
	7	Oct 25-29	Momentum	Conservation of Momentum, Inelastic collisions	8.3	**8**-17,21,25				**3. Work & Energy lab**
				Elastic collisions	8.3	**8**-31,81				
				Conservation of Momentum in 2D	8.4	**8**-63,95				
	8	Nov 1-7	*FALL READING WEEK*							
ROTATION	**9**	Nov 8-12	Rotational Motion	Angular quantities, constant angular accel.	10.1-10.2	**10**-7,11,17,43	**Assign #5 (due Sun. Nov. 21, 23:55) Rotation & Equilibrium**	**Quiz #2 (Wed Nov 10) on Assign 2-4**	**Momentum & Collisions**	
				Rotational KE - Moment of Inertia	10.3	**10**-77,89				Pre-lab Quiz on OWL
		(Nov 12: course drop deadline)		Torque, vectors	10.4	**10**-33,35,37				
	10	Nov 15-19	Dynamics of Rotational Motion	Angular Momentum	10.5	**10**-39,41				**4. Momentum & Collisions lab**
			Statics & Stability	Centre of Mass	11.1	**11**-1,3				
				Equilibrium	11.2-11.3	**11**-9,13,69				
OPTICS	**11**	Nov 22-26	Geometric Optics	Optics: reflection, refraction	15.1-15.3	**15**-13,17,95	**Assign #6 (due Sun. Dec. 5, 23:55) Optics**	**Quiz #3 (Wed Nov 24) on Assign 5**	**Ray Optics**	
				Optics: total internal reflection	15.4	**15**-29,31,41				Pre-lab Quiz on OWL
				Optics: lenses	15.5	**15**-53,63,65,105				
	12	Nov 29-Dec 3	Optical Instruments	Optical instruments: Magnifier	17.3	**17**-17,19,71,69				**5. Microscope lab**
				Optical instruments: Microscope	17.4	**17**-21,73				
				Optical instruments: Eye	17.1-17.2	**17**-9,11,13,63				
	13	Dec 6-8	Optical Instruments	Optical instruments: Eye						
				Optics - review				**Quiz #4 (Wed Dec 9) on Assign 6**		
		Dec 9	*UWO Study Day*	*No Classes / No Exams*						
		Dec 10-21	***Exam period***					Final Exam (date TBA)		