PHYSICS 1028 – PHYSICS FOR THE BIOLOGICAL SCIENCES I
COURSE SYLLABUS

1. COURSE DESCRIPTION

Physics 1028 – Physics for the Biological Sciences I (3 lecture hours, 3 laboratory/tutorial hours, 0.5 course): Fundamental physics concepts are introduced with examples of biological and medical applications. Topics include kinematics, forces, energy, linear momentum, collisions, rotational motion, torque and angular momentum, geometric optics and microscopes.

Pre-requisites: One of the following: Grade 12U Advanced Functions (MHF4U), Mathematics 0110A/B.
Anti-requisites: Physics 1021, 1301A/B, 1302A/B, 1401A/B, 1402A/B, 1501A/B, 1502A/B, the former Physics 1020, 1024, 1026.

Note: It is the **student's responsibility** to ensure that all pre-requisite, co-requisite and anti-requisite conditions are met or that special permission to waive these requirements has been granted by the Faculty. As per the *UWO Academic Policies*, "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 have the necessary prerequisites."

2. COURSE OBJECTIVES

- Develop basic understanding of fundamental physics concepts related to linear and rotational motion, work and conservation of energy, and geometric optics.
- Develop problem-solving and critical-thinking skills.
- 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. CONTACT INFORMATION

Course instructors Dr. Mahi Singh, Professor, Physics & Astronomy (Sept 6 – Sept 27)
Dr. Shantanu Basu, Professor, Physics & Astronomy (Sept 30 – Oct 18)
Dr. Eugene Wong, Professor, Physics & Astronomy (Oct 21 – Dec 5)

Course coordinator Eugene Wong, PhD, FCCPM
Physics and Astronomy Building (PAB), PAB233

Course administrator Dr. Maryam Tabeshian, Physics & Astronomy

Course e-mail address phys1028@uwo.ca for **administrative** (not physics) issues only.

- Emails are handled by the course administrator and then pass onto instructors.
- You may not get a response if you send email to individual instructors. Please allow 2-3 working days for a response.
- Post **all** physics-related questions to the **OWL Forum anonymously** (see below). Physics-related questions will **not** be answered in emails.
- *Note: We will not read or respond to email from addresses other than your UWO email account **(@uwo.ca**).*

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

Lab e-mail Contact physlab1@uwo.ca for all concerns related to the labs.

4. COURSE DELIVERY

Lectures: 3 lecture hours per week – Mon/Wed/Fri (NSC 145)
Lecture section 001: 11:30 - 12:20 Lecture section 002: 14:30 - 15:20

***Online Western Learning (OWL)*:** Selected materials will be available via OWL http://owl.uwo.ca. Note that there are two different OWL websites for this course: one will cover the class or lecture components, and the second will cover the lab components. Course materials are subject to minor changes, so check regularly for updates and notices on both Physics 1028 OWL sites by logging in at http://owl.uwo.ca using your UWO username and password.

The **Class OWL** (***Physics 1028A 001 FW19***) will provide access to the following:

- ***Announcements***: important notices and reminders will be posted here. You can set your Preferences (person icon beside Log Out) to send you an email daily or for each posting.
- ***Discussion Forum***: Please post questions on course content or physics problems on the OWL discussion forum, so that everyone can benefit from (and contribute to) the responses. Do not email instructors or the TAs directly – they may be ignored.
- ***Gradebook***: Grades for all course evaluation components will be posted here. For items completed online (e.g. WebAssign below), their grades will be incorporated into OWL at the end of term. Only the final lab grade will be shown on the Class OWL; grades for individual labs will be posted on the Lab OWL.
- ***Resources***: lecture notes, course schedule (incl. assignments, quizzes, exams), Help Centre schedule.
- ***Syllabus***: this course summary document, which is our course 'contract'.

The **Lab OWL** (***Physics 1028A 003 FW19***) will provide access to the following:

- ***Announcements***: Important notices related to the labs.
- ***Gradebook***: Grades for individual labs and pre-lab assignment(s). Each lab section (003 to 014) is divided into 4 subsections: A, B, C, D. A schedule for each lab sub-section will be posted to the Lab OWL. You must attend your assigned subsection. Your assigned 'subsection' will also be communicated here.
- ***Lab Assignments***: Pre-lab homework.
- ***Lab Schedules***: Schedules posted for each of the lab sections (and corresponding subsections) showing lab and room assignments for the thirteen weeks of the term. You must attend your assigned lab subsection.

Laboratories: 3 hour labs are scheduled on a two-week rotation starting the week of September 23.

- Direct all laboratory questions to the lab instructor, Dr. Shailesh Nene (details above).
- The Lab site on OWL will be the primary source for all details related to the labs.
- Labs are located on the second floor of the Materials Science Addition (MSA). See the department webpage for a map: www.physics.uwo.ca/undergraduate/current_students/labyr1.
- A lab orientation lecture will be posted on the lab site. You must familiarize yourself with the contents of this lecture *before attending your first lab*.
- A **mandatory online lab assignment** will be available via the Lab OWL, and due the week prior to the start of labs. You *must pass this assignment with* $\geqslant$*70%* in order to receive a grade for your first lab.

WebAssign.net: Assignments and quizzes are to be completed using the online WebAssign tool that accompanies the textbook. Note, WebAssign access is required (see below) but the book is not.

***Personal response system*:** For interactive learning, we will be implementing virtual clickers using Western's campus-wide access to iClickers (by Reef Education) on any wireless or Wi-Fi enabled device (e.g. smart phone, tablet, laptop) to access the site during class. Register and sync to this course by selecting the iClickers link in the Class OWL. Then you will need to '**Sign Up**' for an account (see small link *below* the regular sign in). Enter 'Western University' as your institution, then select 'Western University Ontario' from the options. You only need to use this link once to allow you

to sync with the Physics 1028 polling site; after that you may also choose to go directly to the Reef student website or the Reef Student application on your mobile device. Go to http://reef-education.com or download the REEF Polling for iClicker app for your Apple or Android device to sign into your REEF account. Note: you will receive a 0 grade for this if you do not use your Western email username as your iClicker account username.

Drop-in Help Centre: Help on lecture material will be available on various days as per the schedule posted on our Physics 1028 OWL Bulletin Board. 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.

5. COURSE MATERIAL

The following course materials can be purchased at the UWO Bookstore:

Textbook "*University Physics",* Pearson Collections 1028A **custom etext** for the first 6 weeks of the term (recommended).
"*College Physics"* by **Serway and Vuille** (Nelson) full or custom printed textbook or ebook for the last 6 weeks of the term (recommended).

WebAssign WebAssign.net access is required for completing the online assignments and quizzes. You can access WebAssign directly through our OWL course page. **If you are registered in the course as of August 26, 2019, an account has been created on WebAssign for you if you have not created one already. You should have received an email from WebAssign indicating you have been added to a new WebAssign Class. Those with an existing account were not provided a new password, but those without an account were provided with a randomly generated one.** Once you logged in, you will have immediate access with a 14-day grace period, after which you need to enter your access code purchased from the bookstore.

WebAssign access code can be purchased with or without Serway's ebook, and with and without the physical copy of the textbook.

Lab Manual ***Physics Laboratory Manual 2019-2020 for Physics 1028*** *(required)*
The lab manual is sold separately and must be new each year. Be sure to buy the correct package (i.e. NOT the version for Physics 1301/1401/1501).

Calculator ***Sharp EL-510RNB*** *Scientific Calculator (or 510R / 510RN).* It is the same one required for chemistry and biology. This is the *only* calculator allowed in the exams.

6. COURSE EVALUATION

Overall:

Assignments – online	10%	(5 assignments)
Quiz – online	2%	(1 quiz)
Clickers	2%	
Midterm Examination	38%	(Saturday October 19, 9:00 a.m. – 12:00 noon)
Final Examination	38%	(date and time to be announced by Registrar's Office)
Labs	10%	(see P1028 Lab site on OWL for further details)

Part I (Prof Singh Sept 6 – Sept 27 and Basu Sept 30 – Oct 18):

Introduction/Review of Newton's Laws, Applications of Newton's Laws, Work and Energy Young (Chapters 1-7)		
Assignments – online	4%	(2 assignments: Assign1 week 1-3, Assign 2 week 4-6)
Midterm Examination	38%	(Saturday October 19, 9:00 a.m. – 12:00 noon)
Makeup Midterm Exam		Friday October 25th

Part II (Prof Wong Oct 21 – Dec 5):

Momentum, Rotational Motion and Dynamics, Optics Serway (Chapters 6-8, 22-25)		
Clickers	2%	(minimum of 4 in-class clicker session participation)
Assignments – online	6%	(3 assignments: Assign 4: week 6-8, Assign 5: week 8-10, Assign 6 week 10-12)
Quiz – online	2%	(1, week 10)
Final Examination	38%	(date and time to be announced by Registrar's Office)
Makeup Final Exam		Jan 11, 9 am – 12 pm WSC 55

Assignments – Your grade will be based on your 5 assignment scores.

Unit Quizzes – there will be 1 timed online quiz after the midterm.

Clickers – iClickers will be used at least once per week in part II of the course during lecture. Each clicker session participation will count for 0.5% of the course grade. Two percent course grade will be given to those who participated 4 or more times. Participation means answering clicker questions, but not on the correctness of the responses. Note: you will receive a 0 grade for this if you do not use your Western email username as your iClicker account username.

Any errors, or appeals to your assignment or quiz scores, must be reported to your instructor (via phys1028@uwo.ca) *within two weeks* of the due date.

Labs – lab reports will count for 10% of your grade. All questions related to lab administration or scheduling should be directed to the lab instructor Dr. Shailesh Nene. You are responsible for understanding both the physics concepts and the methodology in the labs, which will be tested on your examinations. Students are required to complete **all 4 labs plus the 1 online lab homework**. The final lab mark will be the average of the 4 lab marks. The exception is that one lab may be missed with appropriate documentation (see Accommodations below). ****In order to pass the course, a student must obtain a passing grade for the laboratory component.****

Examinations will consist of written midterm and final exams.

- **Dates** – The Midterm Exam has been set (see Course Schedule). The Final Exam will be scheduled for a date within the university final exam period; the date will be announced by the Registrar's Office, usually by late October. Students needing to make travel arrangements are advised to book a travel date *after the end of the final exam period* as exams can get rescheduled within that period. No makeup exams will be given to accommodate travel.
- **Examination format** will consist of a combination of multiple-choice questions – some are designed to test conceptual understanding of topics covered in class and others are numerical problems that test problem-solving abilities and physics concepts. Exams also will include questions based on the laboratory experiments. Examinations will be *closed* book with a formula sheet provided.
- The final exam is cumulative covering approximately 10-20% pre-midterm and 80-90% post-midterm materials. The final exam may also contain multi-select multiple choice questions: that is, there maybe more than 1 correct answer, and to receive full mark for the question, you will have to have selected all the right choices. *If you have selected an incorrect answer as part of your response, you will receive no mark, regardless of how may correct ones you have chosen.* If you have selected part but not all the correct answers, you will get part marks (for example, if there were 2 correct answers but you only selected one of them, you will get 50% mark for the question).
- **Calculators** will be required. Only *Sharp EL-510* series (R, RN, or RNB) calculators will be permitted. If you are in doubt about your calculator, show it to us ***before*** the examination date.
- **Seating** – Students will be assigned to write in a particular room using seat-planning software; you must attend the correct room (and seat if specified).
- **Prohibited items** – no extra written material, and no PDAs, advanced calculators, computers, cell phones, music players, or devices capable of connecting to the internet, etc., are permitted during exams, not even as a clock.

Exam scores will be posted in the Gradebook on the *OWL* site (http://owl.uwo.ca). Any errors, or appeals to your scores, must be reported to your instructor (via phys1028@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.

> ***Important****:* In order **to pass Physics 1028,** a student must obtain: a passing mark in the laboratory component. Students not meeting this requirement will be assigned a final course mark of no more than 40%.

7. ADMINISTRATIVE POLICIES

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

A. Academic considerations/accommodations:

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reporting of absence or via the Dean's Office/Academic Counselling unit of your Home Faculty. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca.

For further information, please consult the university's policy on academic consideration for student absences:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf.

***B. Make-up Policy*:**

a) *Lab Marks* – Make-up policy for the laboratory are given in the Physics Lab Outline on the associate physics lab OWL site.

b) *Online Assignments* – 5 assignments will be available online over the course term. Extension to a missed assignment will only be granted with either a self-reporting of absence or via approval from the Dean's Office/Academic Counselling unit of your Home Faculty.

c) Online Quizzes – One online quiz will be given after the midterm exam. If you miss the quiz and want to take the online makeup quiz on a later date, you must submit a self-reporting absence or provide documentation to an Academic Counselor in your Faculty Dean's Office, who will determine if you should be accommodated.

d) *Clicker participations* – There will be no makeup for in-class clicker participations. If you missed most lectures during the term and wished to be accommodated for the clicker participation marks, you will need to provide documentation to an Academic Counselor. If approved, the 2% clicker grade will be shifted to the final exam.

e) *Midterm Examination* – We will provide one make-up exam that may be written only with the permission of an Academic Counselor in the Faculty of Science Office. Approval from an Academic Counselor is required if you have direct exam conflicts or multiple exam situations, e.g. 3 exams in 23 hours: see https://registrar.uwo.ca/academics/examinations/exam_conflicts.html.

f) *Final Examination* – If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam). Note that if you fail to write a 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 (i.e. the following December for this course). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_conflicts.html).

C. Cheating and Plagiarism

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: http://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.

- 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.
- There is one online quiz in this course, and you must take this timed quiz by yourself. It is considered cheating if you **share** or **receive** parts or whole questions and/or answers with your fellow students verbally, in writing or electronically.

***D. Classroom Conduct*:** Disruptive behavior will not be tolerated in class, in clicker responses, in the labs, or the course OWL forums. Please respect the rights of your classmates to benefit from the lecture by limiting your conversations to those essential to the class. Students who persist in loud or rude behavior will be asked to leave.

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).

8. 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 661-2147 if you have any questions regarding accommodations.

The policy on Accommodation for Students with Disabilities can be found here: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Learning-skills counsellors at the Student Development Centre (http://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.

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

Additional student-run support services are offered by the USC, http://westernusc.ca/services.