

Forman Christian College

Physics 100 (Bachelors of Studies): SYLLABUS – ‘Spring 2023’ – On Campus

This course meets the Bachelor of Studies degree requirements.

*This course is **NOT recommended** for students who have passed physics in Intermediate or A-levels or equivalent. Knowledge of elementary mathematics/pre-calculus is preferable.*

Professor: Dr. Sufian Aslam

Office: S-014 Armacost Science Block

042-9231581-88 ext:573

Email: sufianaslam@fccollege.edu.pk

Class meeting Time:

Sec	Lab S-027	Lessons S-007
B	2:00 – 3:50 (W)	11:00 – 12:15 Tu, Th
Office Hours	M W F	12:00 – 13:00 By appointment only (send an e-mail)

Availability outside Class Hours (above): – By appointment only (send an e-mail)

Course content:

Introduction to physics, lays emphasis on basic concepts that can be treated with elementary mathematics. These include applications of physics in everyday life to which the student can relate with. Concepts to be taken up are:

Scope of Physics; Communications; Basic Electricity; Kinematics and bodies in motion; Medical Physics.

This course is designed to provide students with a working knowledge of the elementary physics principles, as well as their applications, and to enhance their conceptual understanding of physical laws in the above areas.

Assessment:

Course assessment and evaluation is based on a blend of regular quizzes, homework sets and/or reports from the lab/activity period, midterm and final exams and other evaluative tools. This course meets the Bachelor of Studies Honours degree General Education requirements.

Duration:

One 16-week semester (5 - 6 weeks in summer) including examinations and preparation time.

Contact time: (Fall and Spring)

Three contact hours (lessons) of theory and two contact hours of laboratory work per week.

Student Learning Outcomes:

By the end of this course, it is hoped that students will be able to:

1. Understand and appreciate that most of the natural phenomena can be explained using laws of physics.
2. Develop understanding of the material studied by solving applicable problems.
3. Become familiar with physics principles applicable in other fields of science.
4. Become familiar with the techniques used in measurement and measuring instruments.

Note:

Work in this Course is set and graded CONTINUOUSLY: Thus, to excel in this Course, you need to engage in sustained hard work. To gain maximum benefit you should **lookup material before** Classes.

Credits:		<u>At Mid</u>	<u>After Mid</u>	<u>Total</u>
Theory/ Lab	Attendance/Participation	5	5	10
Tests/Quiz/ Assignments Laboratory Work	Minimum 5 Quiz/Assignments	15	10	30
	Practical Notebook counted as 1 assignment at end of course	–	5	
Mid–Term Test/Exam		20	–	20
Final Examination	20% Lab reports	–	8	40
	80% Final Exam	–	32	
Total		40	60	100
Grades would be calculated as per the University criteria (given in the student handbook/catalogue)				

Gradable Course Work comprises:

A minimum of 5–8 pieces of gradable work, which are likely to be in the form of 20–50–minute quiz of either TF/MCQ or short–questions or a combination, one being the midterm and the last being the final exam.

All examination, tests and assignments shall be CUMULATIVE, i.e., may or may not contain material from previous assignments and tests.

Homework:

2-3 pieces of Homework, which are likely to be in the form of papers of short questions from the text. The solutions to Homework may be reached independently or collaboratively (your choice). However, ALL Homework MUST be written up in your OWN words (see section below on **Academic Honesty**). As already mentioned, Homework assignments can be done in teams, but all team members **MUST turn in an individual set** of homework solutions neatly written or typed, uploaded in the relevant section on **Moodle**.

Laboratory Notebook: is in two parts Non-Electricity and Electricity worksheets. These are to be filled in from a set of Lab work, which involves

your participation within and writing up of about 10 – 12 sessions of laboratory experiments. (Filling tables, plotting graphs and extracting relevant data).

All submissions (Assignments and lab work) should **have their pages numbered and contain your roll number/name on each page.**

Setting and Marking of Gradable Work:

Each piece of Gradable Work is set within ONE WEEK of time indicated on the syllabus. The rules by which marks are allocated are identified each time a piece of Gradable Work is set. You will achieve maximum marks if you:

A) Demonstrate excellence in the following Learning Outcomes:

Thorough appreciation of the Course Content

- Understanding of how to use basic concepts and fundamental laws of physics to explain natural phenomena and apply the knowledge to solve numerical problems.
- Ability to use basic measuring instruments for the purposes of experimentation.
- Utilise, AS A MATTER OF ROUTINE, correct handling practices relating to physical quantities, units and data.
- Ability to self–learn, criticise, and report.

B) Demonstrate excellence in the following aptitudes:

- Use of the medium of English
- Legible writing, neat drawing, and neat calculations and graphing.
- You **MUST** bring into each Lab, or class, where appropriate, your **OWN** calculator to perform and check calculations.

Note:

It is **NOT** permitted for you to share material or calculators during Gradable Class work.

Since the experiments which will be performed by the class comprise the core of the course, **attendance is mandatory**, and will be recorded. Students must organize their work or Laboratory Worksheets in a Folder (to be graded independently of other assignments).

Required Work:

- Attend ALL classes. Arrive on time and stay the entire period.
- Perform all laboratory work and submit all homework assignments on time.
- Take the quizzes and exams.
- Explore, be attentive, interact – pose questions to me or to each other and figure things out.

Note:

1. An assignment/quiz will be posted/given to the class fortnightly (weekly in Summer semester) on the average (see syllabus below).
2. The Notebook/Lab Worksheets need to be e-mailed/submitted weekly.
3. Absences will be approved ONLY in the case of extenuating circumstances. Non-approved absences will quickly erode your course grade.
4. **Note that this Syllabus does NOT provide for makeup exams, re-sits, rescheduling and/or extensions.**
5. You can bring only a one A4 page of notes to the two examination (if held on campus) and no other references.
6. Bring your own calculators to all graded quizzes and exams – **MOBILE PHONES CANNOT BE A SUBSTITUTE FOR CALCULATORS.**

Midterm and Final exam

The exams will be given according to the university schedule, with questions like the quizzes in format.

Required Text:

Physics in Context, W. J. Zealney, M. Hynoski et al, Oxford University Press (ISBN: 0 19 550776 2) [2 vol. set] 2002 or later

Optional Text:

Fundamentals of Physics Extended version, David Halliday, Robert Resnick and Walker, Jerel, (7th Edition) John Wiley & Sons, 2002

University Physics with Modern Physics, Hugh D. Young, Roger A. Freedman, (eleventh edition) (ISBN 81–297–0464–1) Pearson Education Ltd. [LPE] Addison–Wesley, 2004

Syllabus (Chapters from the Textbook)

Weeks		Chapter	Topics	
Fall	Summer			
1 – 2	1	Introduction and Breadth of Physics	<u>Vol I</u> chapter 1	Quiz/ Assignment
3 – 5	2	Communication Physics	<u>Vol I</u> chapter 2	Quiz/ Assignment
6 – 8	3	Elements of electricity	<u>Vol I</u> chapter 3	Quiz/ Assignment
8		Mid Term Examination		
9 – 10	4	Elements of electricity	<u>Vol I</u> chapter 3	Quiz/ Assignment
11 – 15	5 - 6	Motion and kinetics or Medical Physics / Revision	<u>Vol I</u> chapter 4 or <u>Vol II</u> chapter 4	Quiz/ Assignment
		Final Examination		

Attendance and Participation:

In line with the University's expectation of % attendance, this Course rewards attendance and participation. You are to record your attendance on Moodle. Your instructor can also maintain a full record of Class and Lab attendance. Your 10 Attendance Credits are progressively reduced towards 0 if you miss classes. Missing Classes poses other dangers; for example, you may miss a piece of Class work or a Homework deadline. Missed Class works and Homework, or a piece of Lab work means you get no Credits for that piece of work, but there are also penalties for attending, but NOT fully participating.

Academic dishonesty, including plagiarism:

FCC does NOT allow activities, and acts stated above, to ensure that honest students are not disadvantaged. I will be vigilant of offences. I REQUIRE you to use your OWN words when answering questions in pieces of Class work. If, you HAVE committed **Academic dishonesty, including plagiarism**, you will be penalised as described in the Baccalaureate Student Handbook. But honesty is infinitely preferable to losing letter grades or failing.

When on campus

During graded work only allowing you to have at your desk, any Items provided by me (E.g., Question Paper, blank paper etc.).

You can bring only a one A4 page of notes to the two examination (if held on campus) and no other references.

Not allowing you to have at your desk all other UNNECESSARY Items. These include (but are not limited to) BAGS, NOTES and **MOBILE PHONES**. All such UNNECESSARY Items MUST be switched off and placed in your bags or left with the instructor at the front of the class.

Requiring you to sit in seats of MY choice.

Not allowing all forms of communication (verbal, written, electronic etc.) – The only exception is that you may raise your hand if you need my attention.

Requiring you to complete all washroom activities IN ADVANCE.

The penalty for breaking these rules depends on its severity. Use of a mobile phone during a quiz, for example, results in 0 (ZERO) marks for that piece of work AND you will be required to leave the room. In other cases, you may first receive a warning.

Concessions:

- Days when lab is held, are also counted as Attendance days.
- Homework and Gradable written work will ONLY be accepted if submitted by the **end of the working day of the deadline**. Late homework will NOT be accepted unless it is accompanied by proof of an extenuating circumstance.
- If Gradable Work is MISSED for unplanned reasons, concessions may be given, but ONLY in EXCEPTIONAL circumstances – e.g.,

DOCTOR'S NOTE indicating serious illness, but other reasons may be accepted at the discretion of the instructor.

Lab PHYS 100: Experiments (Actual ones if changed shall be notified):

0	Laboratory practices safety and other instructions
1	Measurement of a volume of a cuboid/ prism/ sphere, using a Vernier calliper
2	Measurement of the volume of a sphere/piece of wire using a micrometre screw gauge
3	Verify the law of mass and the law of amplitude for a simple pendulum
4	Verify the law of lengths for a simple pendulum
5	Verify that intensity of light and distance have an inverse square relationship
6	Learn the essential workings of the AC/DC laboratory kit and use of a multi-meter (Voltmeter/Ampere meter)
7	Measure current and resistance in a circuit and verifying Ohm's Law
8	Measure the resistance of resistors in series
9	Measure the resistance of resistors in parallel
10	Measure the resistance of resistors in series and parallel

Evaluation of the Course:

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered online by the Office of Institutional Research and Quality Assurance Cell (QEC) in the two weeks before the Finals.

Additional informal formative surveys may also be administered, by me, within the course as an optional evaluation tool.

1. What You Will Get Out of Completing This Course

- a. When you have completed this course, you will have accomplished the following:

You will have... Learned to

1. Understand and appreciate that most of the natural phenomena can be explained using fundamental laws of physics.
2. Develop an understanding of the material studied by solving applicable problems.
3. Become familiar with physics principles applicable in other fields of science.
4. Become familiar with some techniques used in measurement and measuring instruments.

To Succeed in This course, What Will You Need to Do?

1. Be ready to spend 3 – 5 hours each week on this course, other than on-line meeting time.
2. Be on-time for class and, when you are instructed, to post your work.
 - ***Have a back-up plan for how to access the Internet if you have trouble with your own computer.***
 - When posting on the forum with the class and other participants, be respectful and courteous.

2. What You Can Expect from Me

- a. I, as the Teacher, will make every effort to reply to any specific question within 48 hours of when I receive it.
- b. I will treat all participants with respect. If you feel I am not doing this, please let me know what I am doing that you find disrespectful, and I will change that if I can.
- c. I will do everything I can think of to make this learning experience, enjoyable, and enlightening.

3. Technical Issues

- a. To participate in this course, you will need access to the following software and hardware:

- b. Please make sure that your computer meets the following requirements. It is important to use supported internet browsers (**Microsoft Edge, Google Chrome or Firefox**) while using “Moodle” or “Zoom” etc. to ensure a successful experience.

	Fully Supported Browsers
WINDOWS/MAC	Microsoft Edge (WINDOWS only) Firefox Google Chrome
Android Mobile iPhone™	All Quiz, if on Moodle should be attempted through the Web Browser Moodle APP on Mobile Phones is not supported.

Minimum Technical Skills:

As University students are expected to demonstrate competency in Computer Technology. To be successful in this course, you will need the following technical skills: For the most part, you will only need to be able to do the following technically:

- Use electronic mail with attachments.
- Send messages and Receive documents or attach documents in your official FCC email.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics, or hyperlinks.
- Open documents in *Microsoft Word, Excel or Adobe Acrobat Reader* (PDF).
- Use the University LMS (**Moodle™**) for this course material and for attempting online quizzes, if so required.
- Go to other websites on the Internet.

Lab Work – On Campus Demonstration and conduct of Experiments (if feasible) otherwise link to online experiments that are opensource relating to content and questions concerning the experiments (plotting graphs and extrapolating data – even if measurement is not possible)