# Requirements for a Major in the Physics Department

**The Department of Physics warmly welcomes all students to the new academic year.**

The table below outlines the courses required for a major in the Department of Physics.

*Please note that the scheduling is a guide and electives and foundation courses must be accounted for.*

| MAJORS | YEAR 1 | | YEAR 2 | | YEAR 3 | | ELECTIVES |
|---|---|---|---|---|---|---|---|
| | SEMESTER 1 | SEMESTER 2 | SEMESTER 1 | SEMESTER 2 | SEMESTER 1 | SEMESTER 2 | |
| **GENERAL PHYSICS** | **MATH1141**<br>**MATH1185**<br>**PHYS1411**<br>**PHYS1412** | **ELET 1400**<br>**PHYS1421**<br>**PHYS1422** | **PHYS2300**<br>**PHYS2351**<br>**PHYS2386** | ELET2420 | MATH2230<br>**PHYS3386** | **PHYS2396**<br>PHYS3200<br>**PHYS3351** | Any 3 of the following:<br>PHYS3399; PHYS3565 (highly recommended)<br>Level 2 or 3 PHYS course<br>Level 2 or 3 ELET course |
| **ENERGY AND ENVIRONMENTAL PHYSICS** | | | **PHYS2300**<br>**PHYS2351**<br>PHYS2671 | ELET2420<br>**PHYS2600**<br>**PHYS3661** | ELET3600<br>**PHYS2386**<br>**PHYS3671** | ELET3611<br>**PHYS2396**<br>PHYS3681 | |
| **MEDICAL PHYSICS** | | | ELET2460<br>**PHYS2300**<br>**PHYS2351**<br>**PHYS2386** | **PHYS2200**<br>**PHYS2296**<br>PHYS2396 | PHYS3300<br>PHYS3341 | **PHYS3389** | Any 2 of the following:<br>MATH2230; PHYS3399<br>Level 2 or 3 PHYS course<br>Level 2 or 3 ELET course |
| **MATERIALS SCIENCE** | | **PHYS1421**<br>**PHYS1422** | **PHYS2300**<br>**PHYS2351**<br>**PHYS2386** | **PHYS2500**<br>**PHYS2561**<br>PHYS2671 | PHYS3500<br>**PHYS3562** | PHYS2396<br>**PHYS3561**<br>PHYS3565 | Any 1 of the following:<br>MATH2230; PHYS3399<br>Level 2 or 3 PHYS course<br>Level 2 or 3 ELET course |
| **ELECTRONICS** | | **ELET 1400**<br>**ELET1405**<br>**PHYS1421**<br>**PHYS1422** | **ELET2405**<br>**ELET2430**<br>**ELET2470** | **ELET2410**<br>**ELET2415** | ELET3405 | ELET3490 | Any 5 of the following:<br>Level 2 or 3 ELET course |
| *There are two streams that some electronics students choose to "specialise" in. These are Telecommunications and Robotics & Instrumentation. There are some courses that need to be done in any of these streams and they are listed below. Please note that these are suggestions and are not meant to restrict your choice of courses or course combinations.* | | | | | | | |
| TELECOMMUNICATIONS | **MATH1141**<br>**MATH1185**<br>**PHYS1411**<br>**PHYS1412** | **ELET 1400**<br>**ELET1405**<br>**PHYS1421**<br>**PHYS1422** | **ELET2405**<br>**ELET2430**<br>ELET2450<br>ELET2460 | **ELET2410**<br>**ELET2415**<br>ELET2480 | **ELET2470**<br>ELET3405<br>ELET3470<br>ELET3480 | ELET3450<br>ELET3460<br>ELET3490 | |
| ROBOTICS AND INSTRUMENTATION | | | | | **ELET2470**<br>ELET3405<br>ELET3430<br>ELET3480 | ELET3440<br>ELET3490 | |

Courses in **bold** are required for a minor.

A major in Physics/Electronics requires 36 credits of advanced level (level 2 and level 3) courses.

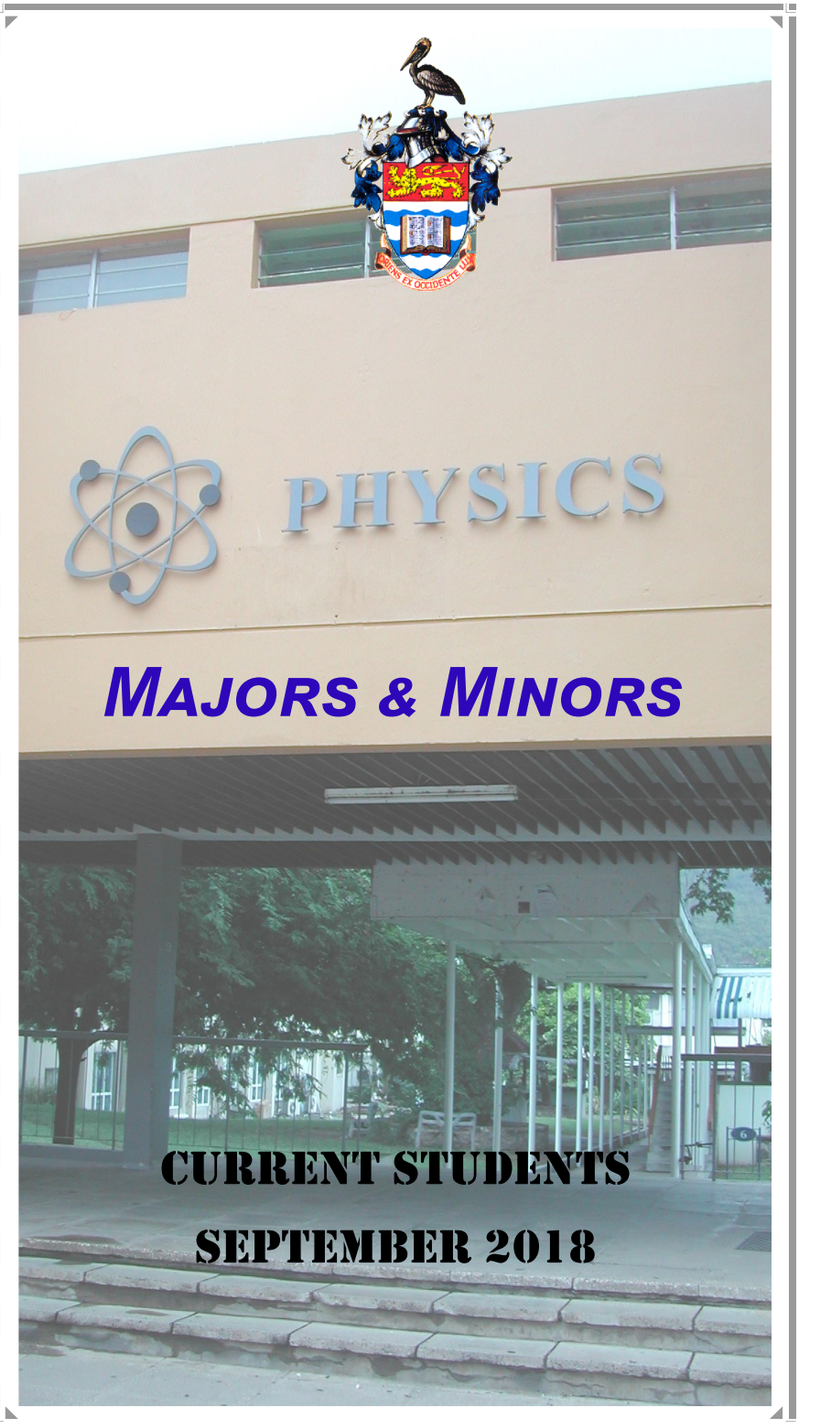
A minor in Physics/Electronics requires 18 credits of advanced level (level 2 and level 3) courses.

Additional Physics/Electronics courses may be needed to complete a major.

*If pursuing a double major, a single advanced level course CANNOT count towards 2 majors. Therefore, due to overlapping core courses, a double major within the department MUST have Electronics as one of the majors. Note well, ELET2420 is a core course for almost all non-electronics major, so it cannot be counted towards the Electronics major as a free elective.*

The Mathematics courses listed are those required to complete Physics majors. For more information on Mathematics courses, please contact the Department on Mathematics. Students pursuing both MATH1142 and MATH1151 otherwise do not need to do MATH1185.

Contact us in the Department of Physics: (876)927-2480; (876)977-1595(Fax); www.myspot.mona.uwi.edu/physics; Email: physics@uwimona.edu.jm



# Physics Courses

| Level | Course Code | Course Title | Pre-requisites | Co-requisites *can be done prior to the course | Semester | Credits |
|---|---|---|---|---|---|---|
| 0 | PHYS0411 | Introduction to Mechanics | CXC Physics **OR** CSEC Physics **OR** GCE O-Level Physics | | 1 | 3-P |
| 0 | PHYS0412 | Introduction to Oscillations & Heat | | | 1 | 3-P |
| 0 | PHYS0421 | Introduction to Electricity & Magnetism | | | 2 | 3-P |
| 0 | PHYS0422 | Introduction to Nuclear Physics & Optics | | | 2 | 3-P |
| 1 | ELET1400 | Introduction to Electronics | CAPE Physics (Units I & II) **OR** GCE A-Level Physics **OR** PHYS0411, PHYS0412, PHYS0421, PHYS0422 **OR** CXC Physics/CSEC Physics/GCE O-Level Physics and CAPE Mathematics (Units I & II)/GCE A-Level Mathematics/MATH0100, MATH0110 | | 1, 2 | 3 |
| 1 | ELET1405 | Practices in Basic Electronics | | ELET1400 | 2 | 3 |
| 1 | PHYS1411 | Mechanics | | | 1 | 3 |
| 1 | PHYS1412 | Waves, Optics & Thermodynamics | | | 1 | 3 |
| 1 | PHYS1421 | Electricity & Magnetism | | | 2 | 3 |
| 1 | PHYS1422 | Modern Physics | | | 2 | 3 |
| 2 | ELET2405 | Practices in Electronics Design I | ELET1400, ELET1405 | Level 2 Electronics or Electronics Engineering course | 1 | 3 |
| 2 | ELET2410 | Analysis and Design of Analog Circuits | ELET1400, PHYS1411, PHYS1412, PHYS1421, PHYS1422, GCE A-Level Mathematics OR CAPE Mathematics (Units I & II) OR MATH0100, MATH0110 | | 2 | 3 |
| 2 | ELET2415 | Practices in Electronics Design II | ELET1400, ELET1405 | Level 2 Electronics or Electronics Engineering course | 2 | 3 |
| 2 | ELET2420 | Semiconductor Devices | ELET1400, PHYS1411, PHYS1412, PHYS1421, PHYS1422, GCE A-Level Mathematics OR CAPE Mathematics (Units I & II) OR MATH0100, MATH0110 | | 2 | 3 |
| 2 | ELET2430 | Digital Circuits & Microprocessors | | | 1 | 3 |
| 2 | ELET2450 | Embedded Systems | | | 1 | 3 |
| 2 | ELET2460 | Signals & Systems | | | 1 | 3 |
| 2 | ELET2470 | Electric Circuit Analysis | | | 1 | 3 |
| 2 | ELET2480 | Communication Systems | | | 2 | 3 |
| 2 | PHYS2200 | Practices in Medical Physics 1 | PHYS1411, PHYS1412, PHYS1421, PHYS1422 | PHYS2296 | 2 | 3 |
| 2 | PHYS2296 | Physics of the Human Body | | | 2 | 3 |
| 2 | PHYS2300 | General Physics Lab I | | PHYS2351, PHYS2386 | 1 | 3 |
| 2 | PHYS2351 | Quantum Mechanics and Nuclear Physics | | MATH1185 | 1 | 3 |
| 2 | PHYS2386 | Electromagnetism & Optics | | | 1 | 3 |
| 2 | PHYS2396 | Computer Applications in Physics | | | 1, 2 | 3 |
| 2 | PHYS2500 | Materials Science Lab I | | PHYS2561 | 2 | 3 |
| 2 | PHYS2561 | Fundamentals of Materials Science | PHYS1411, PHYS1412, PHYS1421, PHYS1422, GCE A-Level Chemistry/CAPE Chemistry (Units I & II)/CHEM0901, CHEM0902 | | 2 | 3 |
| 2 | PHYS2600 | Fluid Dynamics and Environmental Physics Lab | PHYS1411, PHYS1412, PHYS1421, PHYS1422 | PHYS2671 | 2 | 3 |
| 2 | PHYS2671 | Fluid Dynamics | | | 1, 2 | 3 |
| 3 | ELET3405 | Practical Analysis of Advanced Electronic Circuits and Systems | ELET2405, ELET2415 | | 1 | 3 |
| 3 | ELET3430 | Instrumentation and Measurements | ELET2410, ELET2430 | | 1 | 3 |
| 3 | ELET3440 | Introduction to Robotics | ELET2430, ELET2450 | | 2 | 3 |
| 3 | ELET3450 | Satellite Communication & Global Navigation Satellite Systems | ELET2480 | | 2 | 3 |
| 3 | ELET3460 | Digital Signal and Image Processing | ELET2460 | | 2 | 3 |
| 3 | ELET3470 | Wave Transmission & Fibre Optics | ELET2480 | | 1 | 3 |
| 3 | ELET3480 | Wireless Communication Systems | | | 1 | 3 |
| 3 | ELET3490 | Electronics Research Project | ELET2410 OR ELET2450 | | 1, 2 | 4 |
| 3 | ELET3600 | Energy Systems Laboratory | PHYS3671, PHYS3681 | ELET3611 | 1 | 3 |
| 3 | ELET3611 | Integrating Alternative Energy | ELET2420 | PHYS3671, PHYS3681 | 2 | 3 |
| 3 | PHYS3200 | Advanced General Physics Lab | PHYS2300 | PHYS3351, PHYS3386 | 2 | 3 |
| 3 | PHYS3300 | Advanced Practices in Medical Physics | PHYS2200 | | 1 | 3 |
| 3 | PHYS3341 | Biomedical Optics and Biomechanics | PHYS2296 | | 1 | 3 |
| 3 | PHYS3351 | Modern Physics 2 | PHYS2351 | | 2 | 3 |
| 3 | PHYS3386 | Electromagnetism | ELET2480 OR PHYS2386 | | 1, 2 | 3 |
| 3 | PHYS3389 | Medical Radiation Physics & Imaging | PHYS2296 | | 2 | 3 |
| 3 | PHYS3395 | Astronomy & Cosmology | PHYS1411, PHYS1412, PHYS1421, PHYS1422 | | 2 | 3 |
| 3 | PHYS3399 | Research Project (Non-Electronics) | Head of Department's Permission | | 1, 2 | 4 |
| 3 | PHYS3500 | Advanced Materials Science Laboratory | PHYS2500 | | 1 | 3 |
| 3 | PHYS3561 | The Physics of Crystalline Materials | PHYS2561 | | 2 | 3 |
| 3 | PHYS3562 | The Physics of Non-Crystalline and Amorphous Materials | | | 1 | 3 |
| 3 | PHYS3565 | Thermodynamics and Kinetics of Materials | | | 2 | 3 |
| 3 | PHYS3661 | Physics of the Atmosphere & Climate | PHYS1411, PHYS1412, PHYS1421, PHYS1422 | | 2 | 3 |
| 3 | PHYS3671 | Solar Power | PHYS3661 | | 1 | 3 |
| 3 | PHYS3681 | Wind & Hydro Power | PHYS2671, PHYS3661 | | 2 | 3 |
| 1 | MATH1141 | Introduction to Linear Algebra & Analytic Geometry | GCE A-Level Mathematics **OR** CAPE Mathematics (Units I & II) **OR** MATH0100, MATH0110 | | 1 | 3 |
| 1 | MATH1185 | Mathematics for Scientists & Engineers | | | 1 | 3 |
| 2 | MATH2230 | Engineering Mathematics II | MATH1185, MATH1141 | | 1 | 3 |