BSC. MAJOR IN PHYSICS

The Department of Computer Science, Mathematics & Physics offers a Major and Minor in Physics. If you want to find out how does the Universe work, or what is light, or what is gravity, you can learn the answers to all these questions by applying for the Major or Minor in Physics, and prepare yourself for an exciting career in Science and engineering.

Students will discover:

- how electromagnetic waves are produced
- why your phone could not function without quantum mechanics
- how light and matter interact
- how a car engine functions according to the laws of thermodynamics
- how we can calculate the age of the Universe
- what is the sun's energy source.

The Physics major requires that students take ten (10) advanced courses in Physics.

Students will take courses in:

- Electromagnetism
- Lasers
- Quantum Mechanics
- Special Relativity
- Thermodynamics
- Sustainable Energy

Provided below is a complete list of all the courses offered in the Major in Physics:

MAJOR IN PHYSICS:

LEVEL I

PHYS1200 Physics I: Mechanics of Translational Motion
PHYS1205 Physics II: Rotation, Waves and Thermodynamics
PHYS1210 Physics III: Electric Fields, Currents and Circuits
PHYS1220 Physics IV: Magnetism, Electromagnetic Waves and Optics
MATH1190 Calculus A
MATH1195 Calculus B

LEVEL II

PHYS2400 Mathematical Methods in Physics I
PHYS2405 Mathematical Methods in Physics II
PHYS2410 Modern Physics
PHYS2415 Theory of Classical Mechanics
PHYS2420 Advanced Physics Laboratory I

LEVEL III
PHYS3420 Electromagnetic Theory I
PHYS3480 Theory of Quantum Mechanics
PHYS3485 Theory of Statistical Mechanics

AND Six (6) Credits From Physics Elective Courses:
ELET2215 Microprocessor Systems
ELET2220 Circuit Simulation and Applications
ELET2225 Discrete Component Electronics
ELET2230 Digital Communication Systems I
ELET2235 Automation Technology and Applications
ELET2240 Sensor and Actuation Devices
ELET3215 Microcontroller Technology
ELET3220 Control Systems
ELET3230 Essentials of Digital Signal Processing (DSP)
ELET3235 Digital Communication Systems II
ELET3240 Digital Communication Systems III
ELET3250 Biomedical Instrumentation
ELET3255 Wireless Communications
ELET3260 Advanced Microprocessors and Systems
PHYS2425 Computational Methods in Physics
PHYS3445 Fundamentals of General Relativity and Cosmology
PHYS3450 Fluid Mechanics
PHYS3455 Lasers and Optical Systems
PHYS3460 Physics of Sustainable Energy Systems
PHYS3465 Electromagnetic Theory II
PHYS3470 Biological Physics
PHYS3475 Fundamentals of Solid-State Physics
PHYS3490 Physics One-Semester Research Project
PHYS3495 Physics Two-Semester Research Project
PHYS3955 Physics Internship

MINOR IN PHYSICS (Fifteen (15) Credits):

Twelve Credits (12) Credits From:

PHYS2400 Mathematical Methods in Physics I
PHYS2405 Mathematical Methods in Physics II
PHYS2410 Modern Physics
PHYS2415 Theory of Classical Mechanics

AND at Most Three (3) Credits From:

PHYS2420 Advanced Physics Laboratory I
PHYS2425 Computational Methods in Physics
PHYS2420 Advanced Physics Laboratory I
PHYS2425 Computational Methods in Physics
PHYS3420 Electromagnetic Theory I
PHYS3445 Fundamentals of General Relativity and Cosmology
PHYS3450 Fluid Mechanics
PHYS3455 Lasers and Optical Systems
PHYS3460 Physics of Sustainable Energy Systems
PHYS3465 Electromagnetic Theory II
PHYS3470 Biological Physics
PHYS3475 Fundamentals of Solid-State Physics
PHYS3480 Theory of Quantum Mechanics
PHYS3485 Theory of Statistical Mechanics

Equivalences between Old and New Physics Courses For the Purpose of Fulfilling Major and Minor Requirements.

Old Course	**New Course**
PHYS1100 Mechanics	PHYS1200 Physics I: Mechanics of Transitional Motion
PHYS1101 Electricity & Magnetism	PHYS1210 Physics III: Electric Fields, Currents and Circuits
PHYS1102 Optics, Thermodynamics & Modern Physics	PHYS1205 Physics II: Rotation Waves and Thermodynamics
No Equivalent	PHYS1220 Physics IV: Magnetism, Electromagnetic Waves and Optics
PHYS2100 Mathematical Methods in Physics	PHYS2400 Mathematical Methods in Physics I
PHYS2101 Quantum Mechanics and Special Relativity	PHYS2410 Modern Physics
PHYS2102 Solid State Physics	PHYS3475 Fundamentals of Solid-State Physics
PHYS2103 Classical Mechanics	PHYS2415 Theory of Classical Mechanics
PHYS2105 Computational Physics I	PHYS2425 Computational Methods in Physics

PHYS2106 Advanced Physics/Technology Laboratory I	PHYS2420 Advanced Physics Laboratory I
PHYS2107 Advanced Physics/Technology Laboratory II	Any Physics Elective
No Equivalent	PHYS2405 Mathematical Methods in Physics II
PHYS3100 Quantum Mechanics	PHYS3480 Theory of Quantum Mechanics
PHYS3101 Electrodynamics	PHYS3420 Electromagnetic Theory I
PHYS3102 Optics and Lasers	PHYS3455 Laser and Optical Systems
PHYS3103 Astrophysics Cosmology	PHYS3445 Fundamentals of General Relativity and
PHYS3105 Statistical Mechanics	PHYS3485 Theory of Statistical Mechanics
PHYS3106 Physics Research Project	PHYS3490 Physics One-Semester Research Project
PHYS3107 Fundamentals of Photovoltaic Systems	PHYS3460 Physics of Sustainable Energy Systems
None	PHYS3450 Fluid Mechanics
None	PHYS3465 Electromagnetic Theory II
None	PHYS3470 Biological Physics
None	PHYS3495 Physics Two-Semester Research Project

If persons want to:

- Become an Engineer
- Pursue an advanced Science degree
- Work as a Technician
- Teach Science and Mathematics
- Acquire a solid scientific background to use in any profession

Then this degree is for you!

For further details on the Physics programme, contact the Discipline Coordinator for the Physics programme – Dr. Carlos Hunte, via email at carlos.hunte@cavehill.uwi.edu, or via telephone at (246) 417-4382 or (246) 417-4365.