

Curriculum: BSc majoring in Physics and Engineering Subjects				
Code	Year 1 - Semester 1	Credits	Internal Route	Prerequisites to enter the module
PHYS1514	Physics: Mechanics, optics, electricity	16		Must have passed MATM1534 previously or register simultaneously with MATM1534
MATM1534	Mathematics: Calculus 1	16		NSC Mathematics L6 (70%) or WTW/WTV164 (MATD1564) or WTW184 (MATM1584)
CHEM1513	Inorganic & Analytical Chemistry	12		NSC Physical Sciences L4 (50%)
CHEM1551	Analytical and Inorganic Chemistry Practicals	4		Co-register with CHEM1513 or after CHEM1552 + CHEM1642 passed
CSIL1511	Intermediate Computer Literacy (Test)	4		None
UFSS1504	UFS 101			None
EALN/AGAN1508	For students that score below 65 % in NBT language section			None
QALC1513	Academic Literacy, Language & Communication	12		None
CSIE1606	Programming and Problem Solving	12		None
Sub-total Semester 1		76		

Year 1 - Semester 2				
PHYS1624	Physics: Mechanics, thermodynamic, electric, magnetism	16		PHYS1514 or (60%PHYS1534) and MATM1534
MATM1644	Mathematics: Calculus and Algebra	16		(50% in MATM1534) or (50% in MATM1614)
MATM1622	Introduction to Advanced Mathematics	8		(60% in MATM1534) or (60% in MATM1544) or (60% in MATM1644) or MATM1614
MATA1684	Applied Mathematics: Engineering Statics	16		NSC Mathematics Level 5 or 50% in MATD1534 or MATD1564 or MATM1584
CSIE1606	Programming and Problem Solving	12		None
QEFO1520	Engineering Forum	0		None
QEDR1524	Engineering Drawings	16		None
Sub-total Semester 2		84		
Sub-total Year 1		160		

Code	Year 2 - Semester 1	Credits	Internal Route	Prerequisites to enter the module
PHYS2614	Physics: Mechanics, waves, optics	16		(PHYS1514 or 60% PHYS1534) and (PHYS1624 or 60% PHYS1644) and MATM1534 and MATM1644
PHYS2632	Physics Practical	8		Co-requisite: PHYS2614 or Pass PHYS2614 previously
MATM2614	Mathematics: Vector Analysis	16		50% in both MATM1544/1644 and MATM1622 or 50% in MATM1624
MATA2674	Applied Mathematics: Engineering Dynamics	16		MATA1614/MATA1684 + (MATM1544/MATM1644 or MATM1624)
MATA2654	Mathematics: Ordinary Differential Equations	16		(60% in MATM1544) or (60% in MATM1644) or (50% in both MATM1544 and MATM1622) or (50% in both MATM1644 and MATM1622) or 50% in MATM1624
PLUS			PLUS	
QMSC2613	Material Science	12	Mech	None
OR			OR	
CSIS2614	Computer Data Structures and Algorithms	16	Elec	CSIS1624 or 65% for CSIE1606
OR			OR	
QMAT2613	Engineering Materials	12	Civil	None
Civil sub-total Semester 1		84		
Mechanical sub-total Semester 1		84		
Electric/Electronic sub-total Semester 1		88		

Year 2 - Semester 2				
PHYS2624	Physics: Electronics	16		(PHYS1514 or 60% PHYS1534) and (PHYS1624 or 60% PHYS1644) and MATM1534 and MATM1644
PHYS2642	Physics: Electromagnetism	8		PHYS2614
MATA2684	Applied Mathematics: Dynamics of rigid bodies	16		MATA2674 or MATA1624
MATM2664	Mathematics: Sequences and series	16		(50% in MATM1624) or (50% in both MATM1544 and MATM1622) or (50% in both MATM1644 and MATM1622)
QSTR2624	Strength of Materials 1: Forces & stresses in members	16		PHYS1514 and MATM1534 and MATA1684 (min of 45% exam clearance)
QELT2723	Electrotechnique	12		Co-requisite: PHYS2624 and PHYS2642 simultaneously
QWOR2520	Workshop Practice	0		None
Sub-total Semester 2		84		
Civil sub-total Year 2		168		
Mechanical sub-total Year 2		168		
Electric/electronic sub-total Year 2		172		

Code	Year 3 - Semester 1	Credits	Internal Route	Prerequisites to enter the module
PHYS3714	Physics: Modern physics	16		PHYS2614
PHYS3732	Physics: Statistical physics 1	8		PHYS2614
PHYS3752	Physics Practical	8		PHYS2632 and co-requisite: PHYS3714 and PHYS3732
MATA2754	Scientific Computing (Mat.Lab)	16		(60% in MATM1544) or (60% in MATM1644) or (50% in both MATM1544 and MATM1622) or (50% in both MATM1644 and MATM1622) or 50% in MATM1624
MATA3774	Numerical Analysis (Elective only for NWU + 16 cr)	0		MATM2614 + (MATA2654 or MATM2754) (not for EnSci)
PLUS			PLUS	
QFLO3714	Fluid Mechanics	16		PHYS2614
QSTR3714	Strength of Materials 2: Stress/strain transformation, advanced stress calculations	16	Civil/ Mech	QSTR2624 (min of 45% exam clearance)
OR			OR	
QCLO3714	Computer Logic (C, Assembler)	16		QELT2723
QSIG3714	Signal Theory	16	Elec	QELT2723 (45%)
Sub-total Semester 1		80		

OPTION 1 FOR YEAR 3, SEMESTER 2: FOLLOW THE ENGINEERING ROUTE				
Year 3 - Semester 2				
Continue with Engineering modules				
QVAC3520	Practical Engineering Experience	0		None
QENV3724	Holistic Engineering Design	16		QSTR2624
PLUS			PLUS	
QSTR3724	Strength of Materials 3: Statically Indeterminate Structures	16		QSTR2624 (Co-requisite for 2nd opportunity)
GLGY2641/43	Engineering Geology + Practical (Civil + 16 cr)	16	Civil	GEOPI1514 and GEOH1624 or BSc Majoring in Physics and Engineering Subjects
QGE03624	Geotechniques	16		
QCIV3624	Civil Engineering	16		None
OR			OR	
QMAD3623	Machine Design	12		QSTR2624 (Minimum 45% exam clearance)
QSTR3724	Strength of Materials 3: Statically Indeterminate Structures	16	Mech	QSTR2624 (Co-requisite for 2nd opportunity)
QTHE3724	Engineering Thermodynamics	16		PHYS2614 (Minimum 45% exam clearance)
OR			OR	
QMPR3724	Microprocessors	16		QCLO3714
QPOW3724	Electrical Power Systems	16	Elec	QELT2723 and QSIG3714
Civil sub-total Semester 2		80		
Mechanical sub-total Semester 2		60		
Electric/electronic sub-total Semester 2		48		
Civil sub-total Year 3		160		
Mechanical sub-total Year 3		140		
Electric/electronic sub-total Year 3		128		
TOTAL DEGREE CREDITS				
Civil total		488		
Mechanical total		468		
Electric/electronic total		460		

Register for a second degree (for 2 more years) at another University in the disciplines of:
Civil, Electronic, Electrical, Mechanical, Mechatronic Engineering,
(Industrial, Aeronautical at WITS) **OR** enter the employment market

OPTION 2 FOR YEAR 3, SEMESTER 2: FOLLOW THE PHYSICS ROUTE				
Year 3 - Semester 2				
Continue with Physics modules				
PHYS3724	Physics: Solid State Physics	16	Physics	PHYS2614
PHYS3742	Physics: Statistical Physics 2	8	Physics	PHYS3732
PHYS3762	Physics: Practical Work	8	Physics	PHYS2632, co-requisite PHYS3724 and PHYS3742
PLUS ANY TWO			PLUS (TWO)	
MATA3784	Applied Maths: Dynamical Systems	16	Maths	MATM2614 + (MATA2654 or MATM2754)
MATM3744	Algebra	16	Maths	MATM2624
CSIS3744	Computer Networks	16	Comp	CSIS1624 or CSIE1606
<i>OR allowed 2nd sem Engineering Subjects from option 1</i>				
Sub-total Semester 2		64		
Sub-total Year 3		144		

Become a Physicist: study further for BSc Physics Hons, MSc or PhD
OR
enter the employment market