

# ENGINEERING PHYSICS

COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2009 BATCH											
Semester I						Semester – II					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
CS 101	Computer Programming	2	0	2	6	CH 103	Chemistry	2	1	0	6
HS 101	Economics	3	0	0	6	PH 103	Electricity and Magnetism	3	1	0	6
MA 105	Calculus	3	1	0	8	IC 102	Data Analysis and Interpretations	2	1	0	6
PH 105	Modern Physics	2	1	0	6	CH 117	Chemistry Lab.	0	0	3	3
ME 113	Workshop Practice	0	1	3	4	ME 119	Engineering Graphics and Drawing	0	1	3	5
PH 117	Physics Lab	0	0	3	3	MA 106 And MA 108	Linear Algebra and Ordinary Differential Equations I	3 3	1 1	0 0	4 4
NC 101#	National Cadet Corps (NCC)	0	0	0	P/NP	NC 102#	National Cadet Corps (NCC)	0	0	0	P/NP
NO 101#	National Sports Organization (NSS)	0	0	0	P/NP	NO 102#	National Sports Organization (NSS)	0	0	0	P/NP
NS 101#	National Service Scheme (NSS)	0	0	0	P/NP	NS 102#	National Service Scheme (NSS)	0	0	0	P/NP
					33						34
# Any one of these three P/NP courses						# Any one of these three P/NP courses					



## ENGINEERING PHYSICS

***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2008 BATCH***

***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2008 BATCH***

<b>Sem III</b>							<b>Sem IV</b>						
<b>Course code</b>	<b>Course Name</b>	<b>Credit Structure</b>					<b>Course Code</b>	<b>Course Name</b>	<b>Credit Structure</b>				
		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>				<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	
EP 222	Classical Mechanics	3	0	0	6		MA 214	Numerical Analysis	3	1	0	8	
MA 205 And MA 207	Complex Analysis And Diff. Eqns II	3	1	0	4		ES 200	Environmental Studies: Science and Engg	3	0	0	3	
		3	1	0	4		And HS 200	Environmental Studies	3	0	0	3	
EP 201	Optics	2	1	0	6		EP 401	Photonics	2	1	0	6	
EP 203	Thermodynamics	2	1	0	6		EP 226	Waves and Ossillations	2	1	0	6	
IC 211	Experimentation and Measurements Lab	0	0.5	3	4		EP 216	Electronics Laboratory II (Digital Electronics)	1	0	3	5	
EP 215	Electronics Laboratory I	0	0	3	3		EP 213	Physics Laboratory I (GPL)	0	0	3	3	
EE 101	Introduction to Electrical and Electronic Circuits	3	1	0	8								
					41							34	
COURSES FOR HONOURS REQUIREMENT							COURSES FOR HONOURS REQUIREMENT						
PH 542	Non-linear Dynamics	2	1	0	6		PH 306	Continuum Mechanics	2	1	0	6	
COURSES FOR MINOR REQUIREMENT							COURSES FOR MINOR REQUIREMENT						
EP 222	Classical Mechanics	2	1	0	6		EP 210	Introduction to Quantum Mechanics	2	1	0	6	

COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2009 BATCH

Semester V						Semester – VI					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
EN 301	Introduction to Renewable Energy Technologies	3	0	0	6	PH 304	Statistical Physics	2	1	0	6

BT 251	Molecular Cell Biology	2	1	0	6	PH 422	Quantum Mechanics - II	2	1	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Reading Literature/ Sociology	3	0	0	6	EP 224	Electromagnetic Theory – I	2	1	0	6
EP 307	Quantum Mechanics I	3	1	0	8	EP 214	Physics Laboratory II	0	0	3	3
EP 317	Electronics Laboratory III	1	0	3	5		Department Elective - I	2	1	0	6
EP 351	Works Visit				PP/ NP		Department Elective I/Open Elective	2	1	0	6
					31						33
COURSE FOR HONOURS REQUIREMENT						COURSE FOR HONOURS REQUIREMENT					
EP 322	Supervised Learning	0	0	0	6	EP 408	Methods in Experimental Nuclear & Particle Physics	2	1	0	6
COURSE FOR MINOR REQUIREMENT						COURSE FOR MINOR REQUIREMENT					
EP 331	E M Theory and Relativity	2	1	0	6	EP 404	Solid State Physics	2	1	0	6

***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech. ) w.e.f. 2009 BATCH***

COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech. ) w.e.f. 2009 BATCH													
Semester VII							Semester – VIII						
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure					
		L	T	P	C			L	T	P	C		
PH 505	Nuclear Physics	2	1	0	6	EP 412	Physics of Quantum Devices	3	0	0	6		
PH 430	Condensed Matter Physics	2	1	0	6		Institute Elective - II	3	0	0	6		
PH 440	Atomic and Molecular Physics	2	1	0	6		Department Elective II	3	0	0	6		
EP 411	Analytical Techniques	2	0	2	6		Department Elective III	3	0	0	6		
EP 311	Physics Laboratory III (Opt,Spec)	0	0	3	3		Department Elective IV	3	0	0	6		
	Institute Elective - I	3	0	0	6								
					33						30		
COURSE FOR HONOURS REQUIREMENT						COURSE FOR HONOURS REQUIREMENT							
EP 491	Seminar Project *	0	0	0	6	EP 492	Research Project **	0	0	0	6		
COURSE FOR MINOR REQUIREMENT						COURSE FOR MINOR REQUIREMENT							
PH 332	Thermal and Statistical Physics	2	1	0	6	PH 510	Light Matter Interactions	2	1	0	6		

\* Subject to a minimum CPI of 7.5.

Other students may have to take a Departmental Elective to fulfill the Honours Requirement of 5 Courses

\*\*Subject to obtaining a BB Grade in Seminar Project and approval of Guide. Other students may have to take a Departmental Elective to fulfill the Honours requirement of 5 Courses.

## Odd Semester Electives

### Departmental Electives

EP 406	: Applied Solid State Physics
EP 419	: Quantum Optics
PH 523	: Quantum Mechanics - III
EP 503	: Advanced Magnetic Materials and Applications

## Even Semester Electives

### Departmental Electives

PH 525*	: Electromagnetic Theory - II
PH 537	: Group Theoretical Methods in Physics
PH 540	: Elementary Particle Physics
PH 544	: General Theory of Relativity
PH 534	: Quantum Information and Computing
EP 403	: Advanced Statistical Physics
PH 508	: Theoretical Nuclear Physics
PH 522	: Theoretical Condensed Matter Physics
EP 438	: Advanced Simulation Techniques in Physics
EP 502	: Superconductivity and Low Temperature Physics
EP 503	: Advanced Magnetic Materials and Applications
EP 432	: Physics of Nanostructures and Nanoscale Devices
EP 440	: Nanomaterials, Nanostructures and Nanofabrication
MM 474	: Science and Technology of Thin Films
AE 415	: Flight Mechanics
EE 724	: Nano-electronics
EE 606	: Fibre Optics Communications

- Electromagnetic Theory-II will be redesigned as a course of relativistic formulation of electrodynamics. It will be a compulsory course for



Msc students in their fourth semester and can be offered as an elective to EP students in the even semester.

# ENGINEERING PHYSICS

COURSE CURRICULUM FOR THE NEW PROGRAMME ( Dual Degree ) w.e.f. 2009 BATCH											
Semester I						Semester – II					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
CS 101	Computer Programming	2	0	2	6	CH 103	Chemistry	2	1	0	6
HS 101	Economics	3	0	0	6	PH 103	Electricity and Magnetism	3	1	0	6
MA 105	Calculus	3	1	0	8	IC 102	Data Analysis and Interpretations	2	1	0	6
PH 105	Modern Physics	2	1	0	6	CH 117	Chemistry Lab.	0	0	3	3
ME 113	Workshop Practice	0	1	3	4	ME 119	Engineering Graphics and Drawing	0	1	3	5
PH 117	Physics Lab	0	0	3	3	MA 106 And MA 108	Linear Algebra and Ordinary Differential Equations I	3 3	1 1	0 0	4 4
NC 101#	National Cadet Corps (NCC)	0	0	0	P/NP	NC 102#	National Cadet Corps (NCC)	0	0	0	P/NP
NO 101#	National Sports Organization (NSS)	0	0	0	P/NP	NO 102#	National Sports Organization (NSS)	0	0	0	P/NP
NS 101#	National Service Scheme (NSS)	0	0	0	P/NP	NS 102#	National Service Scheme (NSS)	0	0	0	P/NP
					33						34
# Any one of these three P/NP courses						# Any one of these three P/NP courses					



# ENGINEERING PHYSICS

COURSE CURRICULUM FOR THE NEW PROGRAMME ( Dual Degree) w.e.f. 2009 BATCH											
Sem III						Sem IV					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
EP 206	Classical Mechanics	3	0	0	6	MA 214	Numerical Analysis	3	1	0	8
MA 205 And MA 207	Complex Analysis And Diff. Eqns II	3	1	0	4	ES 200  And HS 200	Environmental Studies: Science and Engg And Environmental Studies	3	0	0	3
		3	1	0	4			3	0	0	3
EP 201	Optics	2	1	0	6	EP 401	Photonics	2	1	0	6
EP 203	Thermodynamics	2	1	0	6	EP 226	Waves and Oscillations	2	1	0	6
IC 211	Experimentation and Measurements Lab	0	0.5	3	4	EP 216	Electronics Laboratory II (Digital Electronics)	1	0	3	5
EP 215	Electronics Laboratory I	0	0	3	3	EP 213	Physics Laboratory I (GPL)	0	0	3	3
EE 101	Introduction to Electrical and Electronic Circuits	3	1	0	8						
					41						34
COURSES FOR HONOURS REQUIREMENT						COURSES FOR HONOURS REQUIREMENT					
PH 542	Non Linear Dynamics	2	1	0	6	PH 306	Continuum Mechanics	2	1	0	6

COURSE CURRICULUM FOR THE NEW PROGRAMME ( Dual Degree ) w.e.f. 2009 BATCH											
Semester V						Semester – VI					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
EN 301	Introduction to Renewable Energy Technologies	3	0	0	6	PH 304	Statistical Physics	2	1	0	6
BT 251	Molecular Cell Biology	2	1	0	6	PH 422	Quantum Mechanics - II	2	1	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Reading Literature/ Sociology	3	0	0	6	EP 224	Electromagnetic Theory – I	2	1	0	6
EP 307	Quantum Mechanics I	3	1	0	8		Department/Open Elective – I	2	1	0	6
EP 317	Electronics Laboratory III (Microprocessors)	1	0	3	5	EP 214	Physics Laboratory II (SS,NP)	0	0	3	3
EP 351	Works Visit				PP/ NP	PH 430	Condensed Matter Physics	2	1	0	6
					31						33
COURSE FOR HONOURS REQUIREMENT						COURSE FOR HONOURS REQUIREMENT					
EP 491	Seminar	2	1	0	6	EP 408	Methods in Experimental Nuclear & Particle Physics	2	1	0	6

***COURSE CURRICULUM FOR THE NEW PROGRAMME ( Dual Degree) w.e.f. 2007 BATCH***

<b>Semester VII</b>							<b>Semester – VIII</b>						
<b>Course code</b>	<b>Course Name</b>	<b>Credit Structure</b>					<b>Course Code</b>	<b>Course Name</b>	<b>Credit Structure</b>				
		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>				<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	
PH 505	Nuclear Physics	<b>2</b>	<b>1</b>	<b>0</b>	<b>6</b>		EP 432	Physics of Nanostructures and Nanoscale Devices	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	
EP 425	Introduction to Nanoscience and Nanotechnology	<b>3</b>	<b>1</b>	<b>0</b>	<b>6</b>			Institute Elective - II	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	
PH 440	Atomic and Molecular Physics	<b>2</b>	<b>1</b>	<b>0</b>	<b>6</b>			Department Elective I	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	
EP 411	Analytical Techniques	<b>2</b>	<b>0</b>	<b>2</b>	<b>6</b>			Department Elective II	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	
EP 311	Physics Laboratory III (Opt,Spec)	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>			DD Elective I	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	
	Institute Elective - I	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>		EP 439	Advanced Laboratory Techniques in Nanoscience	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	
					<b>33</b>							<b>36</b>	
<b>COURSE FOR HONOURS REQUIREMENT</b>							<b>COURSE FOR HONOURS REQUIREMENT</b>						
EP 431	Semiconductor Physics	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>		EP 440	Nanomaterials	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	

***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech./Dual Degree and 5yr. Int. M.Sc.) w.e.f. 2007 BATCH***

<b>Semester IX</b>						<b>Semester – X</b>					
<b>Course code</b>	<b>Course Name</b>	<b>Credit Structure</b>				<b>Course Code</b>	<b>Course Name</b>	<b>Credit Structure</b>			
		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>			<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	Departmental Elective -III	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	EP 594	DD Project II	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>
	DD Elective II	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>						
EP 593	DD Project Stage I	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>						
					<b>42</b>						<b>36</b>

### **Odd Semester Electives**

#### Departmental Electives

EP 407	: Applied Nuclear Physics
EP 419	: Quantum Optics
PH 523	: Quantum Mechanics - III

#### DD Electives

EP 513	: Optical properties of Nanostructured Materials
EE 701	: Introduction to MEMS
EE 669	: VLSI Technology
ME 623	: Cryogenic Engineering - I

### **Even Semester Electives**

#### Departmental Electives

EP 502	: Superconductivity and Low Temperature Physics
PH 525*	: Electromagnetic Theory - II
PH 537	: Group Theoretical Methods in Physics
PH 540	: Elementary Particle Physics
PH 544	: General Theory of Relativity
PH 534	: Quantum Information and Computing
EP 403	: Advanced Statistical Physics
PH 508	: Theoretical Nuclear Physics
PH 522	: Theoretical Condensed Matter Physics
EP 438	: Advanced Simulation Techniques in Physics
EP 503	: Advanced Magnetic Materials and Applications

#### DD Electives

EP 440	: Nanomaterials, Nanostructures and Nanofabrication
MM 474	: Science and Technology of Thin Films
AE 415	: Flight Mechanics
EE 724	: Nano-electronics
EE 606	: Fibre Optics Communications

\* Electromagnetic Theory-II will be redesigned as a course of relativistic formulation of electrodynamics. It will be a compulsory course for Msc students in their fourth semester and can be offered as an elective to EP students in the even semester.



