

DEPARTMENT OF PHYSICS

SYLLABI FOR B.Sc PHYSICS

CURRICULAM AND SCHEME OF EXAMINATIONS (CBCS)
(APPLICABLE TO STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2017-2018 ONWARDS)



KONGUNADU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
COIMBATORE -641029

2017- 2018

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KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS) COIMBATORE-641 029

B.Sc., PHYSICS

Curriculum and Scheme of Examination under CBCS

(APPLICABLE TO STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2017 –2018 ONWARDS)

Semester	Part	Subject code	Title of the Paper	Instruction hours / cycle	Exam. Marks			Duration of Exam. Hrs.	Credit
					CIA	ESE	Total		
I	I	15TML103®	LAN –Tamil I/Hindi I/ French I / Malayalam I / Sanskrit I	6	25	75	100	3	3
	II	15ENG101	LAN–English I	6	25	75	100	3	3
	III	15UPH101	C.P.1– Properties of Matter and Sound	6	25	75	100	3	5
		15UPH2CL	C.Pr.1-Practical I	3	-	-	-	-	-
		15UMA1A1	Allied Subject I Mathematics – I	7	25	75	100	3	5
	IV	15EVS101	Environmental Studies**	2	-	50	50	3	2
II	I	15TML202®	LAN- Tamil II / Hindi II/ French II /Malayalam II / Sanskrit III	6	25	75	100	3	3
	II	15ENG202	LAN- English II	6	25	75	100	3	3
	III	15UPH202	C.P.2 – Heat and Thermodynamics	6	25	75	100	3	5
		15UPH2CL	C.Pr.1-Practical I	3	40	60	100	3	2
		15UMA2A2	Allied Subject I Mathematics –II	7	25	75	100	3	5
	IV	16VED201	Value Education Moral and Ethics**	2	50		50	3	2
III	I	15TML303®	LAN - Tamil III/Hindi III/ French III / Malayalam III / Sanskrit III	6	25	75	100	3	3
	II	15ENG303	LAN –English III	6	25	75	100	3	3
	III	15UPH303	C.P.3 – Mechanics	4	25	75	100	3	5
		15UPH4CM	C.Pr.2 Practical II	3	-	-	-	-	-
		15UCH3A3	Allied Subject II Chemistry –I	4	20	55	75	3	4
		15UCH4AL	Allied Practical Chemistry Practical	3	-	-	-	-	-
	IV	15UGA3S1	Skill based Subject 1 – General Awareness	2	25	75	100	3	3
	IV	17TBT301/ 17TAT301/ 17UHR3N1	Basic Tamil*/Advanced Tamil** / Non Major Elective-I**	2	75		75	3	2

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IV	I	15TML404 [@]	LAN – Tamil IV/Hindi IV/ French IV / Malayalam IV Sanskrit IV	6	25	75	100	3	3
	II	15ENG404	LAN – English IV	6	25	75	100	3	3
	III	15UPH404	C.P.4 – Electricity and Magnetism	4	25	75	100	3	5
		15UPH4CM	C.Pr.2 – Practical II	3	40	60	100	3	2
		15UCH4A4	Allied Subject II Chemistry –II	4	20	55	75	3	4
		15UCH4AL	Allied Practical Chemistry Practical	3	20	30	50	3	2
	IV	15UPH4S2	Skill based Subject –2 Medical Instrumentation	2	25	75	100	3	3
		17TBT402/ 17TAT402/ 17UWR4N2	Basic Tamil* / Advanced Tamil** / Non Major Elective- II**	2	-	75	75	3	2
V	III	15UPH505	C.P.5 – Astrophysics	4	25	75	100	3	4
		15UPH506	C.P.6 – Optics and Laser Physics	4	25	75	100	3	4
		15UPH507	C.P.7 – Principles of Electronic Devices and Circuits	4	25	75	100	3	4
		15UPH508	C.P.8 – Quantum Mechanics and relativity	4	25	75	100	3	5
		17UPH5E1	Major Elective Paper – I Principles of Communication Systems / Mathematical Physics	4	25	75	100	3	5
		15UPH6CN	C.Pr.3 – Practical III - General	3	-	-	-	-	-
		15UPH6CO	C.Pr.4 – Practical IV - Electronics , Digital Electronics and Microprocessors	2	-	-	-	-	-
		15UPH6CP	C.Pr.5 – Practical V - Programming in C	2	-	-	-	-	-
	IV	15UPH5S3	Skill Based Subject 3 - Programming in C	3	25	75	100	3	3
VI	III	15UPH609	C.P.9 – Atomic and Solid State Physics	4	25	75	100	3	4
		15UPH610	C.P.10 – Fundamentals of Digital Electronics	4	25	75	100	3	4
		15UPH611	C.P.11 – Nuclear Physics	4	25	75	100	3	5
		17UPH6E2	Major Elective Paper - II Energy Sources and Nanoscience / Object oriented programming in C++	4	25	75	100	3	5

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		17UPH6E3	Major Elective Paper - III Electronic Instrumentation / Introduction to Biophysics	4	25	75	100	3	5
		15UPH6CN	C.Pr.3 Practical III - General	3	40	60	100	3	2
		15UPH6CO	C.Pr.4 – Practical IV - Electronics , Digital Electronics and Microprocessors	2	40	60	100	3	2
		15UPH6CP	C.Pr.5 – Practical V – Programming in C	2	40	60	100	3	2
	IV	15UPH6S4	Skill Based Subject 4 – Introduction to Microprocessor	3	25	75	100	3	3
	V	12NCC/NSS/Y RC/PYE101\$\$	Extension Activities*	-	50	-	50	-	1
			Total	180			3800		140

@ Malayalam – 15MLM 101 - 404
 @ Hindi/ French/ Sanskrit – 15HIN/FRN/SAN 101 - 404

* No End of Semester Examinations (ESE), only Continuous Internal Assessment (CIA)
 ** No Continuous Internal Assessment (CIA), only End of Semester Examinations (ESE)

Major Elective Papers

1. Principles of Communication Systems
2. Energy Source and Nanoscience
3. Electronic Instrumentation
4. Mathematical Physics
5. Object oriented programming in C++
6. Introduction to Biophysics

Non - Major Elective papers

1. Human Rights
2. Women's Rights

Note:

In core/allied subjects no. of papers in both theory and practical are included wherever applicable. However the total credits and marks for core /allied subjects remain the same as stated below.

MAJOR ELECTIVE PAPER 1: PRINCIPLES OF COMMUNICATION SYSTEMS

Total Hours of Teaching: 60

Total Credits: 5

Objectives

To enable the learners to understand

- i. Modulation, demodulation, transmission lines and antennas
- ii. Radio, cellular, fiber optic, television and satellite communications

UNIT I

12 hrs

Modulation and Demodulation

Amplitude modulation- Theory of AM- modulation index – Single side band generation – Suppression of carrier-Frequency modulation-Expression for FM wave- PM definition- Comparative advantages and disadvantages of FM, PM and AM – Basic principles of demodulation-The diode detector - Ratio detector .

UNIT II

12 hrs

Transmission Lines and Antennas

Line equations of transmission lines- Short circuited and open ended lines – Standing wave ratio- relation between SWR and reflection coefficient - Types of transmission lines - Properties of transmission lines - Mechanism of electromagnetic radiation from resonant circuit - Elementary dipole antenna-current and voltage distribution in a half-wave dipole antenna – Principle of radiation of a half-wave dipole antenna-directional pattern- Derivation of E and H in principle of radiation of half-wave.

UNIT III

12 hrs

Radio and Cellular Communications

Classification of Radio Transmitters -AM radio transmitter stages –note on AM radio broadcast transmitters - Principle of superheterodyne receiver-Block diagram of the stages of superhet - AM receiver - Block diagram of stages of a FM radio receiver – difference between AM and FM receivers – Cellular communications (Elementary ideas).

UNIT IV

12 hrs

Fiber Optic Communications

Fiber cable construction - Fiber optic cable applications – Acceptance angle and numerical aperture – Propagation of light through an optical fiber (Single mode, Multimode, Step index, Graded index) – Fiber configuration (Single mode step index, Multimode step index and Multimode graded index fibers) - Light sources and detectors – Optical connectors and couplers – Transmitter for fiber optic communication – High performance circuit(LED digital transmitter) – Fiber optic receiver – High performance receiver – Repeaters – Fiber optic based modems : Transreceivers.

UNIT V

12 hrs

Television and Satellite Communications

Principle of picture transmission and reception – gross structure of a television – Picture elements – Scanning, image continuity and persistence of vision – Horizontal and vertical blanking pulses – TV camera tubes: image orthicon – Vidicon – The block diagram of a basic TV transmitter – Block diagram of a monochrome TV receiver. Introduction on satellite communications – **Satellite links and Satellite construction*** – Different domestic satellites.

*** Self study**

Books for study:

- | | |
|--|--|
| 1 Communication Electronics | Deshpande N.D, Deshpande D.A and Rangole P.K,
Tata McGraw Hill Publishers Ltd (1996). |
| 2 Optical Fibres and Fibre Optic Communication | Subir.Kumar, Sarkar ,S.Chand & Co, New Delhi (2001). |
| 3. Basic Television and Video Systems | Bernard Grob, McGraw Hill, New York (1997). |

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Book for reference:

1. .Electronic Communication Systems
2. Electronics Communication Systems

George Kennedy, Tata McGraw Hill Publishers Ltd,
New Delhi (2008).
Sanjeeva Gupta, Khanna Publications, Salem (1992).

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SEMESTER – VI
MAJOR ELECTIVE PAPER II - ENERGY SOURCES AND NANOSCIENCE

17UPH6E2

Total Hours of Teaching: 60

Total Credits: 5

Objectives

To enable the learner to

- i. Know about the Conventional Energy Sources and Renewable energy sources.
- ii. To gain knowledge about Nano science and Nano technology.

UNIT I

12 hrs

Conventional Energy Sources

World's reserve - commercial energy sources and their availability – various forms of energy – renewable and conventional energy system – comparison – Coal, oil and natural gas – applications – Merits and Demerits

UNIT II

12 hrs

Solar Energy

Renewable energy sources – solar energy – nature and solar radiation – components – solar heaters – crop dryers – solar cookers – water desalination (block diagram) – Photovoltaic generation – merits and demerits

UNIT III

12hrs

Other forms of energy sources

Energy from Biomass:

Biomass energy - photosynthesis - Biomass conversion technologies (wet processes , dry processes)

Wind Energy:

Principles of wind energy conversion – The nature of the wind – Power in the wind- Applications of wind Energy.

Geothermal energy & Ocean thermal energy:

Nature of Geothermal fields - Geothermal sources – An introduction to Energy from the Oceans

UNIT IV

Development of Nano materials

12 hrs

Introduction - Solid materials and their strength – Perspective of length – Nanoscience and Nano technology - Quantum Structures – Quantum confinement – Top down and Bottom up approach – Synthesis of nanomaterials – Arc discharge method – Coprecipitation method

UNIT V

Overview of Nanomaterials

12 hrs

Nanomaterials and Nanostructures in nature – Super hydrophobic surfaces - Fundamental approaches for cleaning – Self-cleaning and easy cleaning materials: Self-cleaning and easy cleaning glasses and tiles – Self-cleaning paints , textiles and other materials.

Books for study:

1. Renewable energy sources and emerging Technologies D.P. Kothari, K.C. Singal & Rakesh Ranjan Prentice Hall of India pvt. Ltd., New Delhi (2008).
2. Non Conventional Energy Sources, G.D.Rai, Fifth Edition, Khanna Publishers, New Delhi, (12th reprint 2014).
3. Principles of Nanoscience and Nanotechnology M.A.Shah & Tokeer Ahmed , Narosa Publishing house(2010)
4. Nanomaterials, Nanotechnologies and design: Micheal F. Ashby , Paulo J. Ferreira , An introduction for Engineers and Architects Daniel L.Schodek , Elsevier Science (2009)

Book for Reference:

1. Renewable Energy sources and their Environmental impact
2. Non-Conventional Energy Resources
3. Nano Crystals : synthesis , properties and Applications

S.A. Abbasi and Nasema Abbasi
PHI Learning Pvt. Ltd., New Delhi (2008).
D.S.Chauhan & S.K.Srivastava, New Age
International Publishers (2004).
C.N.R.Rao , P.J.Thomas and G.U . Kulkarni ,
Springer (2007)