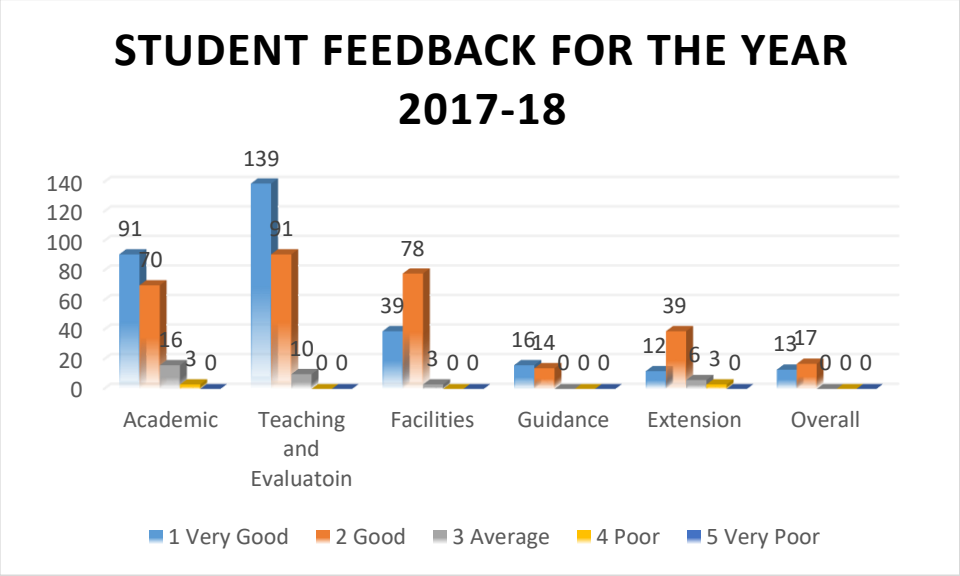
FEEDBACK ANALYSIS



ACTION TAKEN REPORT FOR THE FEEDBACK GIVEN BY STUDENTS, ALUMNI, INDUSTRY AND EMPLOYER FOR THE YEAR 2017-2018

Feedback 1: Advanced Electronics industry based papers can be included

New course papers related to nanofluids and nanoscale systems have been incorporated

17PH3024 NANOFLUIDS

Credit: 3:0:0

Course Objective:

- To know the basics of nanofluids
- To understand the basics of conductive and convective heat transfer
- To learn the application of nanofluids

Course Outcome:

Students will be able to

- Understand the fundaments of cooling and thermal support
- Synthesis nanofluids
- Understand the conduction of heat transfer
- Analyses the fundamentals of convective heat transfer
- Know about boiling and various cooling mechanism
- Find the various industrial application of nanofluids

Unit I - INTRODUCTION TO NANOFLUIDS: Fundamentals of Cooling - Fundamentals of Nanofluids – Making Nanofluids – Materials for Nanoparticles and Nanofluids – Methods of Nanoparticle Manufacture – Dispersion – Milestones in Thermal conductivity measurements – Milestones in Convection Heat Transfer – Mechanism and Models for enhanced thermal support: Structure based Mechanism and Models – Dynamics based Mechanism and Models

Unit II - SYNTHESIS OF NANOFLUIDS: Single step method – Two step method – Synthesis of colloidal Gold nanoparticles : Turkevich method – Brust method – Microwave Assisted Synthesis – Sonolysis – Electrochemical Reduction – Thermal Decomposition – Chalcogenides – Solvothermal Synthesis – Magnetic Nanofluids – Inert Gas Condensation

Unit III - CONDUCTION HEAT TRANSFER IN NANOFLUIDS: Conduction Heat Transfer Steady Conduction: Conduction in slab – Hollow cylinder – composite cylinder- Transient conduction: Lumped-parameter method – One Dimension Transient Conduction - Measurement of Thermal Conductivity of Liquids : Guarded Hot Plate method – Transient Hot wire – Temperature oscillation method (No derivation) – Thermal conductivity of Oxide nanofluids – Hamilton Crosser Theory (Al2O3 – Water and Al2O3 – Ethylene Glycol)

Unit IV - CONVECTION IN NANO FLUIDS: Fundamentals of Convective Heat Transfer – Newton's law of cooling – equations of fluid flow and heat transfer: Navier-Stokes equations, Reynolds number - Prandtl number - Nusselt number - Natural convection : Grashof number, Rayleigh number – Experimental study of natural convection - Convection in Suspensions and Slurries: Eulerian-Eulerian approach – Eulerian-Lagrangian approach

Unit V - POOL BOILING AND APPLICATION OF NANOFLUIDS: Fundamentals of Boiling: Nukiyama curve - Nucleate boiling –Experimental study of Pool Boiling of Water-Al2O3 Nanofluids – Applications of nanofluids: Vechile cooling, Transformer cooling, Biomedical applications

Reference Books

1. Nanofluids: Science and Technology, Sarit K. Das, Stephen U. Choi, Wenhua Yu, T. Pradeep, John wiley sons, 2007
2. Holman J.P., 'Heat Transfer', SI Metric Ed., Mc Graw Hill, ISE, 1972.
3. Heat and Mass Transfer, R.K. Rajput, S. Chand, 2008
4. Heat transfer Principles and applications, Binay K. Dutta, Prentice, Hall of India Pvt. Ltd, New Delhi, 2001.

Feedback 2: Develop the lab facilities for producting research studies

New lab infrastructure such as Pulsed laser deposition, thin film batteries, nanofluids based instruments were installed.

Feedback 3: Subjects related to Semiconductor memory devices and advanced materials can be incorporated

17PH2009 PHYSICS OF SEMICONDUCTOR MEMORIES & MICROPROCESSORS

Credits 3:0:0

Course Objective:

To impart knowledge on

- Various amplifier and oscillator circuits,
- Operational amplifier and its applications
- Microprocessor and its applications, Memory and other interfacing circuits

Course Outcome:

Students will be able to

- Identify the various amplifier and oscillator circuits
- Analyze an operational amplifier and its applications
- Examine the Microprocessor and its applications
- Evaluate the various Memories and other interfacing circuits
- Estimate the Data transfer schemes between peripherals and microprocessor
- Design the assembly programming language

Unit I - Introduction to Electronic Circuits – current voltage analysis of Zener diode and Zener regulator analysis - I.C regulator – Transistor Amplifier — Power Amplifiers circuits – Class A, Class AB circuits.

Unit II - Oscillators – Barkihausen Criterion – Colpits oscillator-Wien bridge oscillator and phase shift oscillators analysis– Positive feedback analysis-OP-amp comparators.

Unit III - Block diagram of Microcomputer - Architecture of Intel 8085 - Instruction formats, Addressing methods-types of Instruction - Intel 8085 - Instruction set - Development of simple assembly language programs and examples.

Unit IV - Memory and I/O devices and interfacing RAM, ROM, EPROM –CRT terminals-Printers-I/O ports-Key boards-ADC/DACs-memory interfacing.

Unit V - Asynchronous and synchronous data transfer schemes-interrupt driven data transfer-DMA data transfer- Simple applications of Microprocessors.

Text Book

1. Ramesh.S.Gaonkar “Microprocessor Architecture, Programming & Applications With 8085/8080a”, Penram International, 2006.
2. Albert Paul Malvino, “Electronic Principles”, Tata McGraw Hill, 8th Edition, 2015.

Reference Books

1. Millman .J. & Halkias.C , "Electronic Devices And Circuits", Tata McGraw Hill, 2007.
2. Adithya P. Mathur, “Introduction to Microprocessor”, Tata McGraw Hill, 3rd Edition, 2002.
3. Malvin Brown, Digital Computer Electronics (English) 3rd Edition, 2002.

MINUTES OF THE BOARD OF STUDIES
DIVISION OF PHYSICS
DEPARTMENT OF PRE-ENGINEERING PROGRAM
Date: 31.03.2017 Time: 10.30 AM

Venue: Department of Sciences - Conference Hall

Members Present

1. Dr. Daphy Louis Lovenia. Professor and Head, Department of Pre-Engineering Program
2. Dr. S. Rajesh, Professor, Physics, Karunya Institute of Technology and Sciences
3. Dr. Ebenezer Chellasamy - Resident Scientist, Kodaikanal Solar Observatory, Indian Institute of Astrophysics, Kodaikanal
4. Dr.A. Abiram, Dept of Physics, Karunya University
5. Dr.D.Khanna, Dept of Physics, Karunya University
6. Dr.B.Vidhya, Dept of Physics, Karunya University
7. Dr.A.Sakunthala, Dept of Physics, Karunya University
8. Dr. J. Suryakanth, Prof & Head, Dept of Physics, KPR Institute of Technology and Sciences – External Expert (Alumni)

The Meeting started with an opening prayer offered by Dr. Daphy Louis Lovenia. The Head of the Department welcomed the members. The HoD informed the committee members about the agenda of the meeting. It was conveyed that the condensed syllabus should be elaborated and be presented in five units format.

The External Expert Dr. Ebenezer Chellasamy - Resident Scientist, Kodaikanal Solar Observatory. Indian Institute of Astrophysics, Kodaikanal discussed on the importance of introducing new courses in the I B.Tech. and M.Sc. Physics curriculum to meet the latest developments in the science and technology. The courses to be taught should have industry oriented placements and skill oriented training leading to employability and entrepreneurship. The following are the list of new courses introduced for various programs that were discussed and deliberated thoroughly and incorporated into the curriculum.

1. Applied Physics
2. Applied Physics Lab
3. Physics for Agricultural Engineers
4. Mechanics and properties of matter
5. Heat and Thermodynamics
6. Spectroscopy

The External member Dr. J. Suryakanth (Alumni), Prof & Head, Dept. of Physics, KPR Institute of Technology and Sciences and the other committee members deliberated on the need to introduce technology oriented new courses for M.Sc. Nano science and technology (Int.) program so that the students can have skills in electronics circuitry and thin film devices enhancing their industrial employability.

1. Physics of semiconductor memories and microprocessors
2. Physics of linear integrated circuits and VLSI design
3. Vacuum and thin film technology
4. Condensed matter physics
5. Renewable energy sources
6. Electricity and Magnetism

Table 1
M.Sc (Physics) – 2017 Batch (90 credits)
Course Components

S.No	Subject Code	Program core- 52 credits & a full semester project Name of the Subject	Credits
1	17PH3001	Classical Mechanics	3:0:0
2	17PH3002	Statistical Mechanics and Thermodynamics	3:0:0
3	17PH3003	Mathematical Physics I	3:1:0
4	17PH3004	Semiconductor Physics	3:0:0
5	17PH3005	Quantum Mechanics I	3:0:0
6	17PH3007	Mathematical Physics II	3:1:0
7	17PH3010	Quantum Mechanics II	3:0:0
8	17PH3008	Atomic and Molecular Spectroscopy	3:0:0
9	17PH3009	Electromagnetic Theory	3:0:0
10	17PH3011	Nuclear and Particle Physics	3:0:0
11	17PH3012	Spectroscopy	3:0:0
12	17PH3013	Solid State Physics	3:0:0
13	17PH3025	General Physics Lab I	0:0:2
14	17PH3026	General Physics Lab II	0:0:2
15	17PH3027	Advanced Physics Lab I	0:0:4
16	17PH3028	Advanced Physics Lab II	0:0:4
17	17VE3002	Value Education III/ IV	2:0:0
		Total Credits	**52**
18	FSP3999	Full Semester Project	20
		Total	**72**

Table 2

S.No	Subject Code	**Soft Core- I (Nanoscience and Technology) Min. of 12 credits to be earned**	Credits
		Name of the Subject	
1	17PH3024	Nano Fluids	3:0:0
2	17PH3014	Physics of Nanomaterials	3:0:0
3	17PH3006	Physical Optics	3:0:0
4	17PH3021	Materials Characterization	3:0:0
5	16NT3002	Nanoelectronics	0:0:2
6	17PH3029	Materials Characterization Lab	3:0:0

Table 3

S.No	Subject Code	**Soft Core- II (Optics) Min. of 12 credits to be earned**	Credits
		Name of the Subject	
1	17PH3018	Radiation treatment and Planning	3:0:0
2	17PH3015	Photonics	3:0:0
3	17PH3033	Astrophysics	3:0:0
4	17PH3030	Computational Physics Lab	0:0:2
5	17PH3031	Simulations in Statistical Physics Lab	0:0:2
6	17PH3032	Heat and Optics Lab	0:0:2

Table 4

S.No	Subject Code	**Electives Min. of 12 credits to be earned**	Credits
		Name of the Subject	
2	17PH3016	Thin Film Technology	3:0:0
3	17PH3017	Renewable Energy Sources	3:0:0
4	17PH3022	Crystal Growth Techniques	3:0:0
5	17PH3023	Radiation Physics	3:0:0
6	17PH3033	Nanofluids	3:0:0

Table 5

Classification	**Credits**
Core Subjects	72
Soft core	12
Elective	6
Total Credits	90

LIST OF NEW SUBJECTS

S.No	Course Code	Name of the Course	Credits
1	17PH1001	Applied Physics	3:0:0
2	17PH1002	Applied Physics Lab	0:0:2
3	17PH1003	Physics for Agricultural Engineers	3:0:1
4	17PH2001	Mechanics and properties of matter	3:0:0
5	17PH2002	Semiconductor Physics-I	3:0:0
6	17PH2003	Heat and Thermodynamics	3:0:0
7	17PH2004	Semiconductor Physics-II	3:0:0
8	17PH2005	Semiconductor Physics Lab-I	0:0:2
9	17PH2006	Semiconductor Physics Lab-II	0:0:2
10	17PH2007	Semiconductor logic devices	3:0:0
11	17PH2008	Spectroscopy	3:0:0
12	17PH2009	Physics of semiconductor memories and microprocessors	3:0:0
13	17PH2010	Physics of linear integrated circuits and VLSI design	3:0:0
14	17PH2011	Photonics	3:0:0
15	17PH2012	Vacuum and thin film technology	3:0:0
16	17PH2013	Condensed matter physics	3:0:0
17	17PH2014	Properties of matter lab	0:0:2
18	17PH2015	Electricity and Magnetism	3:0:0
19	17PH3001	Classical Mechanics	3:0:0
20	17PH3002	Statistical Mechanics and Thermodynamics	3:0:0
21	17PH3003	Mathematical Physics I	3:1:0
22	17PH3004	Semiconductor Physics	3:0:0
23	17PH3005	Quantum Mechanics-I	3:0:0
24	17PH3006	Physical Optics	3:0:0
25	17PH3007	Mathematical Physics-II	3:1:0
26	17PH3008	Atomic and Molecular Spectroscopy	3:0:0
27	17PH3009	Electromagnetic Theory	3:0:0
28	17PH3010	Quantum Mechanics-II	3:0:0
29	17PH3011	Nuclear and Particle Physics	3:0:0
30	17PH3012	Spectroscopy	3:0:0
31	17PH3013	Solid State Physics	3:0:0
32	17PH3014	Physics of Nanomaterials	3:0:0
33	17PH3015	Photonics	3:0:0
34	17PH3016	Thin Film Technology	3:0:0
35	17PH3017	Renewable energy sources	3:0:0
36	17PH3018	Radiation Treatment and Planning	3:0:0
37	17PH3019	Medical Radiation Dosimetry	3:0:0
38	17PH3020	Research Methodology	3:0:0
39	17PH3021	Material characterization	3:0:0

40	17PH3022	Crystal Growth Techniques	3:0:0
41	17PH3023	Radiation Physics	3:0:0
42	17PH3024	Nanofluids	3:0:0
43	17PH3025	General Physics Lab-I	0:0:2
44	17PH3026	General Physics Lab-II	0:0:2
45	17PH3027	Advanced Physics Lab-I	0:0:4
46	17PH3028	Advanced Physics Lab-II	0:0:4
47	17PH3029	Materials characterization lab	0:0:2
48	17PH3030	Computational Physics lab	0:0:2
49	17PH3031	Simulations in statistical physics Lab	0:0:2
50	17PH3032	Heat and Optics lab	0:0:2
51	17PH3033	Astrophysics	3:0:0

The meeting came to an end with the closing prayer offered by Dr.A.Sakunthala.

Daphy Inbasekar S. Rajesh Dr. Ebenezer Chellasamy Dr. A. Abiram

Dr.D.Khanna, Dr.B.Vidhya, Dr.A.Sakunthala Dr. J. Suryakanth