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# Department of Physics

## K L UNIVERSITY

(Deemed to be University U/S 3 of UGC act 1956)



### Minutes of the First Board of Studies Meeting

K L University  
Greenfields, Vaddeswaram,  
Guntur District, Andhra Pradesh

2012-2014

**COR-NSM-STD-REC-1 Standard for issuing the Notices for BOS meetings**

**Meeting Particulars**

Type of Meeting	Board of Studies,
Department Conducting the meeting	Department of Physics
Number of the Meeting	01
Date of Meeting	11-04-2012
Time of Meeting	10 :00 am
Venue of Meeting	FED conference hall, K.L.University

**Persons to Meet**

Serial Number	Name of the Person	Institution	Department of the Person	Designation of the person	Position of the person in the meeting	Primary Responsibility if any
1	Dr. A Srinivasa Rao	K L University	Dept. of Physics	Professor	Chairmen	To Recommend the Syllabus for Engineering Physics, Engineering Materials Courses and recommend the course structure for M.Sc Physics along with Lab
2	Dr. P Madhusudana Rao	J N T U, Hyderabad	Dept. of Physics	Professor & HOD	External Member	-do-
3	Dr. R Ramakrishna Reddy	S K University College of Engineering	Dept. of Physics	Professor	External Member	-do-
4	Dr. K Vijaya Kumar	K L University	Dept. of Physics	Professor	Internal Member	-do-
5	Dr. G Ramakrishna	K L University	Dept. of Physics	Professor	Internal Member	-do-
6	Dr. K S Ramesh	K L University	Dept. of Physics	Professor	Internal Member	-do-
7	Dr. K Srinivasa Ravi	K L University	Dept. of Physics	Professor	Internal Member	-do-
8	Dr. K S N Murthy	K L University	Dept. of Physics	Professor	Internal Member	-do-
9	M V V K Srinivas Prasad	K L University	Dept. of Physics	Asst. Professor	Internal Member	-do-

Agenda Items to Discuss.

Item Number	Agenda Item
PHY-BOS-1201	To resolve and recommend the syllabus of Engineering Physics course (11-BS 103) with Lab for I/IV B.Tech all branches.
PHY-BOS-1202	To resolve and recommend the syllabus of Engineering Materials course (11-ES 103) for I/IV B.Tech all branches.
PHY-BOS-1203	To resolve and recommend the syllabus of M.Sc Physics (Semester I, II, III, IV) along with Lab as per Annexure - I.
PHY-BOS-1204	To resolve and recommend the introduction of Ph.D programmes in the areas: Glass Science and Technology, Nanoscience and Technology, Solid State Ionics, Thin films and Atmospheric Sciences.

Notice Acknowledgement

Serial Number	Name of the Person	Designation	Institution	Signature
1	Dr. A Srinivasa Rao	Professor	K L University	<i>A. Srinivasa Rao</i> 14/11/20
2	Dr. P Madhusudana Rao	Professor	J N T U, Hyderabad	<i>P. Madhusudana Rao</i>
3	Dr. R Ramakrishna Reddy	Professor	S K University College of Engineering Anantapur	<i>ABSEY -</i> <i>Ramakrishna Reddy</i>
4	Dr. K Vijaya Kumar	Professor	K L University	<i>K. Vijaya Kumar</i>
5	Dr. G Ramakrishna	Professor	K L University	<i>G. Ramakrishna</i>
6	Dr. K S Ramesh	Professor	K L University	<i>K. S. Ramesh</i>
7	Dr. K Srinivasa Ravi	Professor	K L University	<i>K. Srinivasa Ravi</i>
8	Dr. K S N Murthy	Professor	K L University	<i>K. S. N. Murthy</i>
9	M V V K Srinivasa Prasad	Asst. Professor	K L University	<i>M. V. V. K. Srinivasa Prasad</i>

Authorized Signatory:

Signature:

COR-NSM-STD-REC-2	Standard for Recording the Minutes of the Meetings
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Particulars of the Meeting conducted

Type of Meeting	Board of Studies,
Department Conducting the meeting	Department of Physics
Number of the Meeting	01
Date of Meeting	11-04-2012
Time of Meeting	10 :00 am
Venue of Meeting	FED conference hall, K.L. University, Guntur

Persons Present

Serial Number	Name of the Person	Institution	Department of the Person)	Designation of the person	Position of the person in the meeting	Primary Responsibility if any
1	Dr. A Srinivasa Rao	K L University	Dept. of Physics	Professor	Chairmen	To Recommend the Syllabus for Physics Courses and recommend the course structure for M.Sc Physics
2	Dr. P Madhusudana Rao	J N T U, Hyd	Dept. of Physics	Professor & HOD	External Member	-do-
3	Dr. K Vijaya Kumar	K L University	Dept. of Physics	Professor	Internal Member	-do-
4	Dr. G Ramakrishna	K L University	Dept. of Physics	Professor	Internal Member	-do-
5	Dr. K S Ramesh	K L University	Dept. of Physics	Professor	Internal Member	-do-
6	Dr. K Srinivasa Ravi	K L University	Dept. of Physics	Professor	Internal Member	-do-
7	Dr. K S N Murthy	K L University	Dept. of Physics	Professor	Internal Member	-do-
8	M V V K Srinivas Prasad	K L University	Dept. of Physics	Asst. Professor	Internal Member	-do-

Resolutions

Agenda Item Number	Agenda Item Description	Important Objections	Resolution	Feedback Reference if any
PHY-BOS-1201	To resolve and recommend the syllabus of Engineering Physics course (11-BS 103) with Lab for I/IV B.Tech all branches.	—	It has been resolved that the syllabus is recommended by the BOS members for approval.	DEP-ACC-YRSRL
PHY-BOS-1202	To resolve and recommend the syllabus of Engineering Materials course (11-ES 103) for I/IV B.Tech all branches.	—	It has been resolved that the syllabus is recommended by the BOS members for approval.	
PHY-BOS-1203	To resolve and recommend the syllabus of M.Sc Physics (Semester I, II, III, IV) along with Lab as per Annexure – I.	—	It has been resolved that the syllabus is recommended by the BOS members for approval.	
PHY-BOS-1204	To resolve and recommend the introduction of Ph.D programmes in the areas: Glass Science and Technology, Nanoscience and Technology, Solid State Ionics, Thin films and Atmospheric Sciences.	—	It has been resolved that the syllabus is recommended by the BOS members for approval.	

Circulation and acknowledgements.

Serial Number	Name of the Person	Designation	Institution	Signature
1	Dr. A Srinivasa Rao	Professor	K L University	A. Srinivasa Rao 11/14/12
2	Dr. P Madhusudana Rao	Professor	J N T U, Hyderabad	P. Madhusudana Rao
3	Dr. K Vijaya Kumar	Professor	K L University	
4	Dr. G Ramakrishna	Professor	K L University	
5	Dr. K S Ramesh	Professor	K L University	
6	Dr. K Srinivasa Ravi	Professor	K L University	K. S. Ravi
7	Dr. K S N Murthy	Professor	K L University	
8	M V V K Srinivasa Prasad	Asst. Professor	K L University	

Authorized Signatory:

Signature:

**K L UNIVERSITY**  
**Department of Physics**

First year 2012 - 2013

L-P-T: 3-0-1

**Course Title** : **Engineering Physics**  
**Course Code** : **11-BS 103**  
**Branch** : **Common to all branches**

**Course content and overview:**

This course is offered for first year B.Tech (all branches) in a semester as one of the courses in basic Sciences (BS). Students are exposed to wave optics covering the aspects of interference and diffraction. The study of polarization helps the students to understand electromagnetic wave propagation in communications and also in stress analysis. Study on lasers like spontaneous and stimulated emission make the student to understand the distinction between a normal source and laser source. The types of lasers like ruby, He-Ne and semiconductor help the student to understand the light sources used in modern technology. The study on ultrasonics mainly the production, detection and Non Destructive Testing including the study of SONAR makes the student to understand the applications in the field of Industry and Medicine. The study on electrostatics mainly the calculation of electric field intensity using coulombs law and Gauss law gives an insight for the student to go into Electromagnetics. Similarly, Students are introduced to magnetostatics to understand the Gauss law and its applications. They are exposed to Amperes law and Biot-Savart's law to calculate magnetic field intensity for current carrying conductors of various of symmetric and unsymmetric systems. The study on Lorentz force on moving charges, and its usage to understand how to produce high energy particles in circular accelerators. The study on the phenomenon of Hall Effect finds application in science technology. Students are exposed to certain basic laws of electrical technology like Faraday's laws, Lenz's law. He will be exposed to Maxwell's equations, which are the fundamental laws used to solve the problems related to electromagnetism. Students are introduced to understand the physics part behind light emitters like LED and light detectors like photo diode and photo transistor. Students are introduced to the significance of alternate energy sources and exposed to one such an alternate source of energy namely SOLAR. The

A. Shrinivasa Rao  
P. Prabhakar Rao  
11/4/12  
11/4/12  
11/4/12

### Scope and Objective of the course:

This course explores the fundamental principles and concepts of Physics from different topics such as wave optics, ultrasonic's, electromagnetism, superconductivity, lasers and optoelectronic devices needed for all engineering students, which they can readily relate to the engineering problems that they would be addressing in their course work.

### Prescribed Text Books

#### Text Books:

1. University Physics, 6<sup>th</sup> edition, Francis W.Sears, Mark W Zemansky, Hugh D Young, Norsa Publishing House.
2. Engineering Physics, 8<sup>th</sup> Edition, R K Gaur and S L Gupta, Dhanpat Rai Publications.

#### Reference Books:

1. Solid State Physics, 6<sup>th</sup> Edition, S.O.Pillai, Newage International Publishers.
2. Applied Physics, P.K.Palanisamy, Scitech publications (India) Pvt.Ltd, Chennai.
3. Physics Volume II 5<sup>th</sup> Edition, Resnick, Halliday and Krane.
4. Engineering Physics, 2<sup>nd</sup> edition, P. K Palanisamy, Sci Tech publications (India) Pvt.Ltd, Chennai.

P. Madhukar 2/11/12  
A. Srinivasa Rao 11/4/12  
M. Srinivasa Rao 11/4/12 07



Engineering Physics (11-BS103)

List of Experiments

Expt. No.	Name of the Experiment
1	Frequency of A.C. supply using sonometer
2	Hall Effect
3	L C R series resonant circuit
4	Haidinger fringes
5	Diffraction Grating by Normal Incidence
6	Newton's Rings
7	Planck's constant
8	Solar Cell
9	Field along the axis of the coil
10	Laser diffraction grating
11	p-n junction diode characteristics
12	Determination of velocity of ultrasonic waves by Interferometer

Note: A student has to complete 10 experiments out of 12 experiments.

P. Prabhakar 11/4/12  
A. Sriniwasa Rao 11/4/12  
M. K. Ravi Kumar 11/4/12 08

# K L UNIVERSITY

## Department of Physics

First year 2012 - 2013

L-P-T: 3-0-0

**Course Title** : **Engineering Materials**

**Course Code** : **11-ES 103**

**Branch** : **Common to all branches**

### Course content and overview:

This course mainly deals with the fundamental principles, Phenomena's, laws and Properties of Engineering materials as relevant to engineering applications for modern day technologies. There is a symbiotic relation between Engineering Materials and Engineering. Broadly speaking without engineering materials there is no engineering. The main Concepts are magnetic materials-classification of materials, soft and hard magnetic materials, Hysteresis phenomena, magnetic materials for transformers, motors, magnetic recording, data storage, relays and sensors. Electrical materials types, electrical conduction mechanism, dielectric polarization methods, Ferro electricity and Piezo electricity and applications of electrical materials. This course is highly useful for mechanical as well as Civil engineers for focusing the concepts on Mechanical and thermal properties of materials-basic properties like stress, strain, ductility toughness, relationship between stress and strain, elasticity, Plasticity, fatigue-fracture, specific heat and thermal conductivity. Classification of ferrous and non-ferrous materials, types of steels and super alloys for automotive engine parts. Classification of construction materials like cement, bricks, stones, wood, glasses and paints. And also deals with composite materials-Laminates, filler resign, copper foil, polyesters for potential applications. Finally this course explores emerging materials such as Nano materials classification of nano materials and their Properties, different synthesis methods like physical vapour, sol -gel technique, CVD technique and their characterization and their potential applications in modern day technologies.

A. Srinivasa Rao  
11/4/12

P. Madhukrishna  
11/4/12  
11/4/2012

**Syllabus:**

**Magnetic Materials:** Basic concepts – magnetic moment, susceptibility, permeability; Types of magnetic materials – Diamagnetic, paramagnetic, ferromagnetic, antiferromagnetic and ferromagnetic materials, structure of ferrites, domain theory of ferromagnetism, magnetostriction effect, Hysteresis of ferromagnetic and ferromagnetic materials; Soft and hard magnetic materials; Applications - Magnetic materials for transformers, motors, magnetic storage, magnetic memories, magnetic tapes, magnetic recorder, relays, sensors and electromagnets.

**Electrical Materials:** Properties of materials – Ohm's law, electrical conductivity, electrical resistivity – conducting materials, semiconducting materials, insulating materials, dielectric materials; Electrical conduction – Ohm's law, electrical conductivity, resistivity;

Dielectric materials: Dielectric polarization – electronic, ionic, orientation or dipolar and space charge polarizations (qualitative treatment), frequency and temperature dependence of polarization, ferro electricity – spontaneous polarization and structure of barium titanate; definition of piezoelectricity.

**Mechanical and Thermal properties of materials:** Definitions – elasticity, plasticity, stress, strain, strength, hardness, brittle, ductility, creep, fatigue, fracture, malleability and toughness; relationship between stress and strain; deformation. Qualitatively treatment of temperature, specific heat and thermal conductivity.

**Classification of ferrous and nonferrous materials:** Metals classification, steel manufacturing process by Basic oxygen process and electric arc furnace process ; classification of carbon steels, Alloy steels; general affects of alloy steels ; Ni-steels, Cr-steels, Ni-Cr Steels; manufacturing process of cast iron, classification , properties and uses ; Aluminium extraction, properties, uses and alloys; Copper extraction, properties, uses and alloys

**Construction materials:** Refractories for furnaces. Composite materials: Laminates, properties of laminates, phenolic laminates, epoxy laminates, silicon laminates.

**Nano materials and Nanotechnology:** Basic concepts of nanotechnology. Properties and technological advantage of nano materials. Carbon nano tubes and applications. Nano material preparation by sol-gel method and chemical vapor deposition.

A. Srinivasa Rao  
P. Mahalingam  
11/4/12  
11/4/12  
11/4/2012

### Scope and Objective of the course:

- This course is designed to enable the students to appreciate the different aspects of engineering materials for their potential device applications in engineering and science and technology. The Students will be exposed to understand the significance of electric and magnetic forces on a moving charged particle and its usage to understand how to produce high magnetization materials like ferrites and how to use these materials in designing of transformers, motors, data storage, recording, relays and sensors for certain applications in science and technology.
- Students will be exposed to understand the basic conduction mechanism in conducting, semi conducting, Insulating and dielectric materials for electronic device applications. Students will know what are mechanical and thermal properties of materials by different synthesizing methods and its role in science and technology. He will come to know about types of alloys, their structures and their applications in automotive engine parts.
- This course is intended to provide for engineering students with background important basic concepts, manufacturing methods and applications of various metals, alloys for industrial applications. And also the students should learn the chemistry of construction materials such as cement bricks wood, paints and refractories and their potential applications, The primary object of this course how collectively engineering materials is important in engineering and also form a bridge of materials knowledge basic sciences and engineering disciplines.
- Finally the Students are exposed for certain emerging materials like Nano materials, CNTs and their fabrication methods, characterization and their potential applications in science and technology.

J. Praveen Kumar 11/4/12

A. Shrinivasa Rao 11/4/12

M. K. R. R. / 11/4/2012

**Books:**

Notes will be made available

**Prescribed Text Books:**

- T1. Material Science and Engineering by W. D. Callister, John Wiley and Sons Company, 2007.
- T2. Elements of material science and engineering, 6<sup>th</sup> Edition, by Van Vlack L.H., Addison Wesley, 1989.
- T3. Material Science by Dr. Arumugam, Anuradha Publications.
- T4. Modern magnetic materials, by O'Handley R.C, John Wiley & Sons, 2000.
- T5. Engineering materials by R.K.Rajput, Laxmi publications new Delhi-2006.

**Reference Books:**

- R1. Material Science by V Raghavan (TMH).
- R2. Material Science by K M Gupta Umesh Publications.
- R3. Material Science by O P Khanna Publications.
- R4. Solid State Physics, 6<sup>th</sup> Edition, S.O.Pillai, Newage International Publishers.
- R5. Building Materials by B.C punmia Lakshmi publications.
- R7. Engineering Material Science by S.C Rangawala Charotar publications.

P. Prabhakar Rao 2/11/12

A. Srinivasa Rao  
11/4/12  
11/4/2012