K.S.R.M COLLEGE OF ENGINEERING

UGC-Autonomous
Kadapa,AP
www.ksrmce.ac.in

Dated: 20-09-2021

Lr./KSRMCE/Principal Office /2021-22/

Principal Office Orders

As per the decisions of the Academic Council meeting held on 09-09-2021 the undersigned members are been appointed as the Board of studies for PHYSICS for a period of 2 years.

S.No.	Name	Designation
1.	Sri Y Ramana Reddy	Asst.Prof ,KSRMCE
2	Dr. K.Venugopal Reddy	Prof&HOD, NIT,Warangal
3	Prof. V.R.K.Murthy	Prof in Physics(Rtd.,)VIT,Amaravathi
4	Dr. K.Thyagarajan	Prof&HOD in Physics ,JNTUACE,Pulivendula
5	Dr.R.Joyce stella	Asst.Prof KSRMCE
6	Sri D.Mallikarjuna Reddy	Asst.Prof KSRMCE
7.	Sri R.Jayaprakash Reddy	Industry Expert
8.	Sri.D.Gangi Reddy	Alumni

The orders will come in to force for with immediate effect.

V.S.S.Murty
Principal

PRINCIPAL
K.S.R.M. COLLEGE OF ENGINEERING
KADAPA-516005, (A.P.)

Cc to:

The Management for information
The HoD of H&S for necessary actions
The Members for Information
The Website Committee for upload

BOARD OF STUDIES MEETING – 2021-22

K.S.R.M COLLEGE OF ENGINEERING

AUTONOMOUS

Minutes of the Meeting

Date	**22-09-2021**	**Day**	**Wednesday**
Time	**11.30 am – 1.00 pm**	**Venue**	**Virtual meeting: http://meet.google.com/ncg-tfdg-yvj**
Dept./SS	**Humanities and Sciences (Physics)**	**Convener**	**Sri. Y. Ramana Reddy**

MembersPresent:08 **Members Absent: 00**

S. No	Name	Designation	Signature	S.No	Name	Designation
1.	Sri. Y. Ramana Reddy	Assistant Prof., in Physics, KSRMCE				
2.	Prof .K. Thyagarajan	Professor and HOD, JNTUP				
3.	Prof . K. Venugopal Reddy	Professor and HOD, NIT, Warangal				
4.	Prof. V.R.K Murthy	Professor of Physics, VIT, Andhra Pradesh				
5.	Sri. R. Jaya Prakash Reddy	Industry Expert				
6.	Sri. D. Gangi Reddy	Alumni				
7.	Sri. D. Mallikarjuna Reddy	Assistant Prof., KSRMCE				
8.	Dr. R. Joyce Stella	Assistant Prof., KSRMCE				

Sri. Y. Ramana Reddy, welcomed all the members to the meeting and presented the agenda of the meeting.

Theresolutionsare:

	Todo item	Discussion	Resolution	Coordinator/in-charge
1	To finalize the curriculum and syllabus for IISemAI & ML Branch under R20 Regulations.	The Board of Chairman has presented the syllabus designed by the faculty after taking the feedback from all stakeholders and comparing with premier institute syllabus	The committee suggested few modifications in Applied Physics syllabus andhas finally approved the syllabus.	Sri.Y. Ramana Reddy
2..	To finalize & approve the certification course syllabus	The Board of Chairman has presented the syllabus designed by the faculty after taking the feedback from all stakeholders.	The committee has approved the certification course syllabus	Sri.Y. Ramana Reddy

Sri. Y. Ramana Reddy, Convener have proposed the Vote of thanks and concluded the meeting.

Convener

HOD H&S

Dr. I. SREEVANI M.Sc.,Ph.D.
Head of Humanities & Sciences
K.S.R.M College of Engineering
KADAPA 516 005

Course Title	APPLIED PHYSICS				B. Tech. II - Sem (AI&ML)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
20AP206	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		2	0	0	2	40	60	100
Mid Exam Duration: 90 Min					End Exam Duration: 3Hrs		

Course Objectives:

- To make a bridge between the physics in school and engineering courses.
- To identify the importance of the optical phenomenon i.e. interference, diffraction related to its Engineering applications.
- To understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications, along with engineering applications.
- To explain the significant concepts of dielectric and magnetic materials that leads to potential applications in the emerging micro devices.
- To enlighten the concepts of Quantum Mechanics and to provide fundamentals of de-Broglie waves, quantum mechanical wave equation and its applications, the importance of free electron theory and band theory of solids.
- Evolution of band theory to distinguish materials, basic concepts and transport phenomenon of charge carriers in semiconductors. To give an impetus on the subtle mechanism of superconductors using the concept of BCS theory and their fascinating applications.

Course Outcomes:

CO1	**Analyze** the differences between interference and diffraction with applications
CO2	**Identifies** the Engineering applications of lasers and the applications of optical fibers in various fields.
CO3	**Understands** the response of dielectric and magnetic materials to the applied electric and magnetic fields.
CO4	**Interpret** the concepts of classical and quantum free electron theories
CO5	**Elaborate** the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductors.

Unit-I: Wave Optics **10hrs**

Interference- Principle of superposition – Interference of light – Conditions for sustained interference - Interference in thin films (Reflection Geometry) – Colors in thin films – Newton's Rings – Determination of wavelength and refractive index.

Diffraction- Introduction – Fresnel and Fraunhofer diffraction – Fraunhofer diffraction due to single slit, double slit and N-slits (qualitative) – Grating spectrum.

Unit Outcomes:
The students will be able to

- Explain the need of coherent sources and the conditions for sustained interference.
- Identify engineering applications of interference.
- Analyze the differences between interference and diffraction with applications.

Unit-II: Lasers and Fiber optics **8hrs**

Lasers-Introduction – Characteristics of laser – Spontaneous and Stimulated emission of radiation – Einstein's coefficients – Population inversion – Lasing action – Pumping mechanisms – Nd-YAG laser – He-Ne laser – Semiconductor diode laser- Applications of lasers.

Fiber optics-Introduction – Principle of optical fiber – Acceptance Angle – Numerical Aperture – Classification of optical fibers based on refractive index profile and modes – Block diagram of Optical fiber Communication system – Propagation Losses (qualitative) – Applications.

Unit Outcomes:
The students will be able to

- Understand the basic concepts of LASER light Sources.
- Apply the concepts to learn the types of lasers.
- Identifies the Engineering applications of lasers.
- Explain the working principle of optical fibers.
- Classify optical fibers based on refractive index profile and mode of propagation.
- Identify the applications of optical fibers in various fields.

Unit-III: Dielectric and Magnetic Materials **8hrs**

Dielectric Materials-Introduction – Dielectric polarization – Dielectric polarizability, Susceptibility and Dielectric constant – Types of polarizations: Electronic, Ionic and Orientation polarizations (Qualitative) – Lorentz internal field – Clausius-Mossotti equation.

Magnetic Materials-Introduction to magnetic materials (Origin of magnetic moment of an atom and Classification of magnetic materials) –Weiss theory of ferromagnetism-soft ferrites and hard ferrites- Hysteresis – Soft and Hard magnetic materials- Applications magnetic materials.

Unit Outcomes:
The students will be able to

- Explain the concept of dielectric constant and polarization in dielectric materials.
- Summarize various types of polarization of dielectrics.
- Interpret Lorentz field and Claussius-Mosotti relation in dielectrics.
- Classify the magnetic materials based on susceptibility and their temperature dependence.
- Explain the applications of dielectric and magnetic materials.
- Apply the concept of magnetism to magnetic devices.

Unit IV: Quantum Mechanics, Free Electron Theory **10hrs**

Quantum Mechanics- Dual nature of matter – Schrodinger's time independent and dependent wave equation – Significance of wave function – Particle in a one-dimensional infinite potential well.

Free Electron Theory-Classical free electron theory (Merits and demerits only) – Quantum free electron theory – Equation for electrical conductivity based on quantum free electron theory – Fermi-Dirac distribution – Density of states – Fermi energy.

Unit Outcomes:

The students will be able to

- Explain the concept of dual nature of matter.
- Understand the significance of wave function.
- Interpret the concepts of classical and quantum free electron theories.
- Explain the importance of K-P model
- Classify the materials based on band theory.
- Apply the concept of effective mass of electron.

Unit – V: Semiconductors and Superconductors **10hrs**

Semiconductors- Introduction – Intrinsic semiconductors – Electrical conductivity – Fermi level – Extrinsic semiconductors –Dependence of Fermi energy on carrier concentration and temperature – Drift and diffusion currents – Einstein's equation – Direct and indirect band gap semiconductors – Hall effect – Hall coefficient – Applications of Hall effect.

Superconductors- Introduction – Properties of superconductors – Meissner effect – Type I and Type II superconductors – BCS theory – Josephson effects (AC and DC) –High T_c superconductors – Applications of superconductors.

Unit Outcomes:

The students will be able to

- Classify the energy bands of semiconductors.
- Interpret the direct and indirect band gap semiconductors.
- Identify the type of semiconductor using Hall effect.
- Identify applications of semiconductors in electronic devices.
- Explain how electrical resistivity of solids changes with temperature.
- Classify superconductors based on Meissner's effect.
- Explain Meissner's effect, BCS theory & Josephson effect in superconductors.

Text books:

1. Engineering Physics – Dr. M.N. Avadhanulu& Dr. P.G. Krishnasagar,S. Chand and Company
2. Optics- AjoyGhatak, McGraw Hill Publishers,6th edition,1stJanuary,2018.
3. Fundamental of Physics- Halliday, Resnick and Walker, Wiley publications.
4. Solid State Physics, Hall H E, paramount Publications

Reference Books:

1. Engineering Physics – K.Thyagarajan, McGraw Hill Publishers
2. Semiconductor Devices-S.M.Sze , Wiley Publications.
3. Lasers & Non-linear Optics Nelkon M parker P, Arnold Heinemann Publications
4. Semiconductor physics and devices- Basic principle – Donald A, Neamen, McGraw Hill

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B.Tech. II Sem (R20UG)									
S.No.	Course Code	Course Name	Category	Hours per Week			IM	EM	Credits
				L	T	P	40	60	
1	2023201	Biology for Engineers	BSC	2	0	0	40	60	2
2	20AP202	Applied Physics	BSC	2	0	0	40	60	2
3	2039202	Introduction to machine learning	ESC	1	0	0	40	--	0
4	2039203	Data Structures	ESC	3	0	0	40	60	3
5	2021204	Mathematics for Intelligent Systems	BSC	2	0	0	40	60	2
6	2039205	Object Oriented Programming through Java	ESC	3	0	0	40	60	3
7	2014206	Principles of Measurements & Sensors	ESC	3	0	0	40	60	3
8	2039207	Data Structures Lab	ESC	0	0	3	40	60	1.5
9	2024209	Communication Skills lab	HS	0	0	3	40	60	1.5
10	2039208	Java Programming Lab	ESC	0	0	3	40	60	1.5
11	20MC211	Community work / NSS	MC	2	0	0	40	--	0
		Total					**440**	**540**	**19.5**

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