Madanapalle Institute of Technology & Science

Affiliated to JNTUA, Anantapur & Approved by AICTE, New Delhi
(AUTONOMOUS)
Recognised Research Center
Recognised by UGC under the sections 2(f) and 12(B) of the UGC act 1956

Estd 1998

GREEN CAMPUS

BOS members for Department of Physics

1. **Chairman:** HoD. Department of Physics, MITS

2. **Members:** Ratified & Senior Faculty of the Department

3. **Experts in the subject:**

   1. **Dr. Ariful Rahaman**
   Associate Professor
   VIT University, Vellore-632014
   Tamil Nadu
   Email: arahaman@vit.ac.in
   Phone: +91 9698439988

   2. **Dr. Y. Nazeer Ahammed**
   Associate Professor
   Yogi Vemana University,
   KADAPA.
   Email: nazeer@yogivemanauniversity.ac.in
   Phone: +919491944454

4. **Expert nominated by the V.C.:**
   Prof. R. Padma Suvarna
   Head, Professor of Physics
   JNTUA College of Engineering, Anantapuramu.
   Email: padmajntua@gmail.com
   Phone: +919441079332

5. **Industry Expert:**
   Mr. M. Ravi Sankar,
   DIO/Scientist D
   National Informatics Center,
   Ministry of Electronics & Information Technology,
   Govt. Of India.
   Chickballapur,
   Bangalore – 560017
   Email: mr.shankar@nic.in
   Phone: +919538802663

Department of PHYSICS
MITS
Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

Re: R20_Revised Syllabus_BoS Meeting_Reg.

padma jntu <padmajntua@gmail.com>
Tue 3/2/2021 3:53 PM
To: Physics Department <physicshod@mits.ac.in>

Sir,
I am approving the syllabus in its original form

On Mon, Mar 1, 2021 at 3:31 PM Physics Department <physicshod@mits.ac.in> wrote:

> Dear Sir/Madam,
>
> Greetings
>
> Thank you very much for your presence, participation, and the suggestions in the BoS Meeting.
>
> Please find the attachments for the modified/revised syllabus copies of the courses as per the discussion conducted in the BoS Meeting today. I have incorporated all the resolutions suggested by the members in the meeting.
>
> Requesting you to acknowledge the same and send your approval through email.
>
> Best regards,
> Dr. Virendra Kumar Verma
> Head, Department of Physics,
> Madanapalle Institute of Technology & Science,
> Madanapalle-517325, Andhra Pradesh, India.

--
Regards,
Dr. R.Padma Suvarna
Professor and Head
Department of Physics
JNTUA - CEA
Ananthapuramu-515 002.

Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

Re: R20_Revised Syllabus_BoS Meeting_Reg.

Y Nazeer Ahammed <ynahammed@gmail.com>
Tue 3/2/2021 4:57 PM
To: Physics Department <physicshod@mits.ac.in>
Cc: padmajntua@gmail.com <padmajntua@gmail.com>; mr.shankar@nic.in <mr.shankar@nic.in>; arahaman@vit.ac.in <arahaman@vit.ac.in>

Sir,

Thank you very much for sending revised syllabus copies and I am approving the same. Kindly do the needful.

With regards,

Yours sincerely,

Prof. Y. Nazeer Ahammed
Department of Physics
Yogi Vemana University
Kadapa-516005, A.P.

On Mon, Mar 1, 2021 at 3:31 PM Physics Department <physicshod@mits.ac.in> wrote:

> Dear Sir/Madam,
>
> Greetings
>
> Thank you very much for your presence, participation, and the suggestions in the BoS Meeting.
>
> Please find the attachments for the modified/revised syllabus copies of the courses as per the discussion conducted in the BoS Meeting today. I have incorporated all the resolutions suggested by the members in the meeting.
>
> Requesting you to acknowledge the same and send your approval through email.
>
> Best regards,
> Dr. Virendra Kumar Verma
> Head, Department of Physics,
> Madanapalle Institute of Technology & Science,
> Madanapalle-517325, Andhra Pradesh, India.

--

Prof.Y. Nazeer Ahammed
Atmospheric Science Laboratory

Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 ...

Re: R20_Revised Syllabus_BoS Meeting_Reg.

Ariful Rahaman S K <arahaman@vit.ac.in>
Tue 3/2/2021 1:33 PM
To: Physics Department <physicshod@mits.ac.in>

Dear Sir,

Good afternoon sir.
I declare that I accept the modified/revised syllabus copies as per the discussion in BoS meeting held on 01.02.2021 in Online mode.

Thank you.

with regards,

Dr. Ariful Rahaman
Associate Professor
Dept. of Manufacturing Engineering
School of Mechanical Engineering
VIT-Vellore
Vellore-632014

From: Physics Department <physicshod@mits.ac.in>
Sent: 01 March 2021 15:31:04
To: padmajntua@gmail.com; ynahammed@gmail.com; mr.shankar@nic.in; Ariful Rahaman S K
Subject: R20_Revised Syllabus_BoS Meeting_Reg.

Dear Sir/Madam,

Greetings

Thank you very much for your presence, participation, and the suggestions in the BoS Meeting.

Please find the attachments for the modified/revised syllabus copies of the courses as per the discussion conducted in the BoS Meeting today. I have incorporated all the resolutions suggested by the members in the meeting.

Requesting you to acknowledge the same and send your approval through email.

Best regards,
Dr. Virendra Kumar Verma
Head, Department of Physics,
Madanapalle Institute of Technology & Science,
Madanapalle-517325, Andhra Pradesh, India.

Verma
Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

Re: R20_Revised Syllabus_BoS Meeting_Reg.

RAVI SANKAR MANGAPOTI <ravi.mangapoti@gmail.com>
Tue 3/2/2021 8:05 PM
To: Physics Department <physicshod@mits.ac.in>

Dear Sir, As per the discussion in BOS yesterday i.e. on 01.02.2021, all the changes in the syllabus can be adopted from the current academic year.
I am sending approval for the same.

Thanking you,

with regards

रवि शंकर मंगापोटी / Ravi Sankar Mangapoti
वैज्ञानिक डी / Scientist D
भारत सरकार / Government of India
इलेक्ट्रॉनिकी और सूचना प्रौद्योगिकी मंत्रालय / Ministry of Electronics & Information Technology
राष्ट्रीय सूचना विज्ञान केन्द्र(एन.आई.सी) / NATIONAL INFORMATICS CENTRE(NIC)
अनंतपुर/ANANTHAPURAMU
आंध्र प्रदेश/ANDHRA PRADESH
Mobile: +91-9538802663
Emergency Contact: +91-9491776565
Office Email : apapr@nic.in
Personal Email: mr.shankar@nic.in

On Tue, Mar 2, 2021 at 6:08 PM Physics Department <physicshod@mits.ac.in> wrote:

> Dear Sir,
>
> Greetings
>
> Thank you very much for your presence, participation, and the suggestions in the BoS Meeting.
>
> Please find the attachments for the modified/revised syllabus copies of the courses as per the discussion conducted in the BoS Meeting today. I have incorporated all the resolutions suggested by the members in the meeting.
>
> Requesting you to acknowledge the same and send your approval through email.
>
> Best regards,
> Dr. Virendra Kumar Verma
> Head, Department of Physics,

Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

BoS Meeting_Dept. of Physics_MITS_Madanapalle_Reg.

Physics Department <physicshod@mits.ac.in>

Sun 2/28/2021 6:58 PM

To: nazeer@yogivemanauniversity.ac.in <nazeer@yogivemanauniversity.ac.in>; padmajntua@gmail.com <padmajntua@gmail.com>; mr.shankar@nic.in <mr.shankar@nic.in>; arahaman@vit.ac.in <arahaman@vit.ac.in>
Cc: Virendra Kumar Verma <vkverma@mits.ac.in>; S. Victor Vedanayakam <victorvedanayakams@mits.ac.in>

3 attachments (89 KB)

20PHY101_Engineering Physics_CIVIL & ME.docx; 20PHY102_Applied Physics_EEE_ECE & CS.docx; 20PHY201_Physics Lab_All.docx;

DEPARTMENT OF PHYSICS
Board of Studies Meeting

Dear Sir/Madam,

Greetings

We are privileged to have you in our Board of Studies in the Department of Physics, MITS Madanapalle.

As per telephonic conversation, we have fourth meeting of Board of Studies in online mode through Microsoft Team which will be held on 01.03.2021 at 01:00 PM for the approval of the syllabi of Physics courses offered by Department of Physics, MITS. I have attached the revised syllabus of the following subjects. I request all the members to go through the revised syllabus so that we can have discussion in BoS meeting for any further modification.

Subjects:

1. Engineering Physics (20PHY101) [For CE & ME]
2. Applied Physics (20PHY102) [For EEE, ECE & CS]
3. Physics Laboratory (20PHY201) [For All]

Tomorrow, I will send the meeting link to all.
Looking forward for your esteemed presence.

Note: The deleted contents are striked and added contents are highlighted by red colour in the revised syllabus.

Thank you very much.

Best regards,
Dr. Virendra Kumar Verma
Head, Department of Physics,
Madanapalle Institute of Technology & Science,

Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

DEPARTMENT OF PHYSICS

Board of Studies Meeting

Minutes of Meeting

Date: 01.03.2021

The IV Board of Studies meeting is held today on 01.03.2021 from 01:00 PM - 02:00 PM by online mode through Microsoft Teams for the approval and evaluation of the syllabus of the two Physics, three Open Electives and one Physics Practical Courses offered by Department of Physics, MITS.

The following members attended the meeting.

Members Present:

Sl. No.	Name	Position on BoS
1.	Dr. Virendra Kumar Verma	Chairman
2.	Dr. R. Padma Suvarna	University Nominee
3.	Dr. Y. Nazeer Ahammed	Subject Expert
4.	Dr. Ariful Rahaman	Subject Expert
5.	Mr. M. Ravi Sankar	Industry Expert
6.	Dr. S. Victor Vedanayakam	Member
7.	Dr. Lokendra Pr Singh	Member
8.	Dr. M. Chandra Sekhar	Member
9.	Dr. B. Jagadeesh Babu	Member
10.	Dr. N. Nanda Kumar Reddy	Member
11.	Dr. Sunku Sreedhar	Member
12.	Dr. Santosh Kumar Pal	Member
13.	Dr. Thirupathy Gadipelly	Member
14.	Dr. G. Shwetha	Member
15.	Dr. Nagarjuna Neella	Member

BoS Chairman & HoD of Physics, Dr. Virendra Kumar Verma explained in detail regarding the syllabus of Physics and Open Electives for B. Tech. Programme to be offered in new regulation R20 from the academic year 2020-2021.

Board members reviewed the following syllabi

1. 20PHY101 Engineering Physics
2. 20PHY102 Applied Physics
3. 20PHY201 Physics Laboratory
4. 20PHY301 Optical Physics and its Applications
5. 20PHY302 Laser Physics & Advanced Laser Technology
6. 20PHY303 Thin Film Technology and Its Applications

We have revised and updated above listed physics syllabus of different courses for B. Tech programme on par with many reputed institutions and according to AICTE & JNTUA guidelines to cover the fundamentals of physics for engineering students to cope up with their core subjects. All physics syllabus of R20 regulations are sent to each BOS Member. All the members are requested to go through the syllabus and thoroughly check for further corrections /modifications /criticisms.

Resolutions:

BOS committee has gone through the proposed syllabi for "*Engineering Physics* (for CE & ME)", "*Applied Physics* (for EEE, ECE & CS)", "*Physics Laboratory* (for all branches)", and open elective courses "*Optical Physics and its Applications*", "*Laser Physics & Advanced Laser Technology*", & "*Thin Film Technology and its Applications*" and resolved the necessary changes for the current syllabus.

Engineering Physics (20PHY101)

1. The board suggested to include "*vectors and algebra of vectors*" in Unit-I which will be useful for the vectorial representation in further topics.

2. According to BoS members, Unit-II is fine and suggested to keep same.

3. The committee members suggested to include "*reflection and transmission of waves at the boundary*" in Unit-III which helps to understand the concepts of formation of stationary waves.

4. Understanding and manipulating the polarization of light is crucial for many optical applications. Hence, the committee members suggested to include the topics "*Polarization, Types of polarization, Polarization by reflection, refraction and double refraction, Nicol's prism, Half wave and Quarter wave plates*" & "*Superposition of waves*" and exclude "*expression for fringe width, intensity distribution graph*" and "*Michelson interferometer*" in the Unit-IV.

5. In Unit-V, BOS suggested to exclude "*semiconductor p-n junction diode*" and include "*Fiber Optics: Principle, Construction and working of optical fiber, Acceptance angle, Numerical aperture, Types of fiber, Fiber optic communication system*" to make the students to understand the fundamental concepts of communication system.

Applied Physics (20PHY102)

6. The topic "*reflection and transmission of waves at the boundary*" in Unit-I is added with the suggestion of committee members. This topic will help students to understand the concepts of formation of stationary waves.

7. In Unit-II, BOS committee suggested to exclude "*expression for fringe width, intensity distribution graph*" and "*Michelson interferometer*" and include the topics "*Polarization, Types of polarization, Polarization by reflection, refraction and double refraction, Nicol's prism, Half wave and Quarter wave plates*" as the polarization of light is crucial for many optical applications.

8. In Unit-III, the topic "*group velocity and phase velocity*" in wave-packet section is added which will help students to understand the difference and relation between group and phase velocity.

9. The committee members suggested to include "*Drift and Diffusion Current, Hall effect*" to understand the physics of charge transport in metal and semiconductor samples and exclude "*Introduction to solids and semiconductors*" and "*p-n junction I-V characteristic*" in Unit-IV.

10. In Unit-V, Board members suggested to include the topics "*Fiber Optics: Principle, Construction and working of optical fiber, Acceptance angle, Numerical aperture, Types of fiber, Fiber optic communication system*" to make the students to understand the fundamental concepts of communication system and exclude "*semiconductor p-n junction diode*".

Physics Laboratory (20PHY201)

11. The Fiber optics topic is added in theory subject. Hence, BoS members suggested to include experiment "*Determination of the numerical aperture of a given optical fiber and hence to find its acceptance angle*" in Physics Laboratory Course. The experiments "*Biot -Savart Law with Helmholtz Coil*" and "*The Wheatstone Bridge*" are can be deleted from Physics Laboratory Course as these topics are not covered in theory subject.

Open Elective Courses

12. The open elective courses "Optical Physics and its Applications", "Laser Physics & Advanced Laser Technology" and "Thin Film Technology and its Applications" were retained the same and unanimously resolved to continue the existing Syllabus with the acceptance of all the BoS members.

It is resolved that the present syllabi brought before the BoS is thoroughly discussed and can be adopted from the current academic year with the suggested modifications.

Head

Department of Physics

Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

Members Present:

Sl. No.	Name	Position on BoS	Signature
1.	Dr. Virendra Kumar Verma	Chairman	
2.	Dr. R. Padma Suvarna	University Nominee	
3.	Dr. Y. Nazeer Ahammed	Subject Expert	
4.	Dr. Ariful Rahaman	Subject Expert	
5.	Mr. M. Ravi Sankar	Industry Expert	
6.	Dr. S. Victor Vedanayakam	Member	
7.	Dr. Lokendra Pr Singh	Member	
8.	Dr. M. Chandra Sekhar	Member	
9.	Dr. B. Jagadeesh Babu	Member	
10.	Dr. N. Nanda Kumar Reddy	Member	
11.	Dr. Sunku Sreedhar	Member	
12.	Dr. Santosh Kumar Pal	Member	
13.	Dr. Thirupathy Gadipelly	Member	
14.	Dr. G. Shwetha	Member	
15.	Dr. Nagarjuna Neella	Member	

Head
Department of Physics

Head of the Department
PHYSICS
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325

20PHY101 ENGINEERING PHYSICS

L	T	P	C
3	1	0	4

Course Prerequisite: Plus two level physics course

Course Description: Engineering Physics for Civil and Mechanical Engineers is a physics course which provides fundamental knowledge to understand the concepts of mechanics, waves and oscillations, interference, diffraction, polarization, lasers and fiber optics.

Course Objectives:

1. Expose students to the fundamental principles and laws of mechanics in Physics to understand the types of motion.
2. Demonstrate the ability to identify and apply the appropriate analytic, numerical, and mathematical reasoning, to situations of the physical world.
3. Analyze the concepts of mechanics, oscillations, waves and optics to prepare the students for advanced level courses.
4. Expose students to theoretical and mathematical aspects of interference and diffraction of light for testing of materials.
5. Adaptability to new developments in science and technology.

UNIT I: MECHANICS OF PARTICLES

Vectors, Algebra of vectors Velocity and Acceleration, Motion in one dimension, several dimensions, formal solution of kinematical equations. Polar Co-ordinates, velocity and acceleration in polar coordinates. Newton's Laws, applications of Newton's laws (Constraint equations, Block on string, Conical Pendulum, Block and Wedge). **(11)**

UNIT II: MOMENTUM & WORK ENERGY

Momentum, law of conservation of linear momentum, flow of mass, Rocket Equation, Rocket in free space and in a gravitational field. Integrating equation of motion in one-dimension-work energy theorem, orbital velocity and escape velocity, Potential energy, Potential energy of a uniform force field, potential energy of an inverse square force, stability, conservation laws and particle collisions. **(11)**

UNIT III: WAVES AND OSCILLATIONS

Simple Harmonic Motion, damped harmonic oscillations, forced harmonic oscillations, resonance, and quality factor. Superposition of vibrations along same direction (equal frequency) and in perpendicular directions, Lissajous figures.

Transverse waves, solution of wave equation, velocity of a transverse wave along a stretched string, modes of vibration of stretched string, reflection and transmission waves at boundary, standing waves, standing wave ratio. **(12)**

UNIT IV: OPTICS

Superposition of waves, interference of light by division of wavefront - Young's double slit experiment, interference of light by division of amplitude- interference in thin film by reflection, Newton's rings experiment.

Diffraction, Farunhofer diffraction due to single slit, double slit and Diffraction grating (N-slit). Polarization, Types of polarization, Polarization by reflection, refraction and double refraction, Nicol's prism. Half wave and Quarter wave plates **(13)**

UNIT V: LASERS & FIBER OPTICS

Introduction to lasers, characteristics of laser, spontaneous and stimulated emission, Einstein's coefficients; population inversion, excitation mechanisms, solid-state lasers – ruby laser, gas lasers - He-Ne Laser, applications of lasers.

Fiber Optics: Principle, Construction and working of optical fiber, Acceptance angle, Numerical aperture, Types of fiber, Fiber optic communication system. **(12)**

Course Outcomes:

Upon successful completion of this course, the students should be able to:

1. Describe and explain the fundamental physical principles and laws of Mechanics in Physics.
2. Explain the concepts conservation of momentum, energy, and predict the future state of a system based on its present state.
3. Apply the physical principles of waves together with logical and mathematical reasoning, to situations of the physical world of vibrations.
4. Define and evaluate the fundamentals of materials testing using Interference, Diffraction & Polarization techniques.
5. Acquire the basic knowledge of lasers and fiber optics.

Text Books:

1. An Introduction to Mechanics by D. Kleppner and R. Kolenkow, Tata McGraw-Hill Edition, 2007.
2. Engineering Physics by Dr. M.N. Avadhanulu & Dr. P.G. Kshirsagar, S. Chand and Company
3. Engineering Physics by K. Thyagarajan, McGraw Hill Publishers

Reference Books:

1. Physics Vol I & II, Halliday/Resnick/Krane 5th Edition, John Wiley, 2003.
2. Concepts of Modern Physics by Arthur Beiser, 7th Edition, 2017
3. Engineering Mechanics, 2nd ed. — MK Harbola
4. Introduction to Mechanics — MK Verma
5. Theory of Vibrations with Applications — WT Thomson

Mode of Evaluation: Assignment, Mid term examinations, and External End Examination.

1. Dr. V. K. Verma (Verma)
2. Dr. S. Victor (S)
3. Dr. Lokendra P. Singh (Singh)
4. Dr M. Chandra Sekhar (M. C. Sekhar)
5. Dr. B. Jagadeesh Babu (B. Jagadeesh)
6. Dr. N. Nanda Kumar Reddy (N)
7. Sreedhar [Dr. S. Sreedhar]
8. Dr. Santosh K. Pal Santosh
9. Dr. G. Thirupathi. G. Thirupathi
10. Dr. G. Shwetha G. Shwetha G. Shwetha
11.

20PHY102 APPLIED PHYSICS

L	T	P	C
3	1	0	4

Course Prerequisite: Plus two level physics course

Course Description: Applied Physics for Electrical, Electronics and Computer Engineers is a basic physics course which provides fundamental knowledge to understand the concepts of Waves, Optics, Quantum Mechanics, Semiconductors, Lasers and Fiber Optics.

Course Objectives:

1. Expose students in understanding the basic laws of nature through wave equation using the principles of oscillations and waves.
2. Analyze and understand the concepts of waves and optics to prepare the students for advanced level courses.
3. Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques, Polarization and Lasers for testing of materials.
4. Develop knowledge and understanding the fundamental concepts of Quantum mechanics, Semiconductors and Fiber Optics.
5. Adaptability to new developments in science and technology.

UNIT I: WAVES AND OSCILLATIONS

Simple harmonic motion, damped harmonic oscillations, forced harmonic oscillations, resonance, and quality factor. Superposition of vibrations along same direction (equal frequency) and in perpendicular directions, Lissajous figures.

Transverse waves, one dimensional wave equation, solution for wave equation, velocity of a transverse wave along a stretched string, modes of vibration of stretched string, reflection and transmission waves at boundary, standing waves, standing wave ratio.

(11)

UNIT II: OPTICS

Superposition of waves, interference of light by division of wavefront - Young's double slit experiment, interference of light by division of amplitude- interference in thin film by reflection, Newton's rings experiment.

Diffraction, Farunhofer diffraction due to single slit, double slit and Diffraction grating (N-slit).

Polarization, Types of polarization, Polarization by reflection, refraction and double refraction, Nicol's prism. Half wave and Quarter wave plates.

(13)

UNIT III: QUANTUM MECHANICS

de Broglie's hypothesis, Uncertainty principle (Qualitative only), Postulates of quantum mechanics, Time-dependent and time-independent Schrodinger equations for wave function, Free-particle wave function and wave-packets (group velocity & phase velocity), Solution of wave equation: Solution of stationary-state, Schrodinger equation for one dimensional problems – particle in a box, Scattering from a potential barrier and principle of tunnelling-operation of scanning tunnelling microscope.

(11)

UNIT IV: FREE ELECTRON THEORY & SEMICONDUCTORS

Free electron theory of metals (drift velocity and electrical conductivity), Fermi energy level, density of states, Kronig-Penney model (Qualitative only) and origin of energy bands, band structure of metals, semiconductors, and insulators. Direct and indirect bandgap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Drift and Diffusion Current, Hall effect. **(12)**

UNIT V: LASERS & FIBER OPTICS

Introduction to lasers, characteristics of laser, spontaneous and stimulated emission, Einstein's coefficients; population inversion, excitation mechanisms, solid-state lasers – ruby laser, gas lasers - He-Ne Laser, applications of lasers.

Fiber Optics: Principle, Construction and working of optical fiber, Acceptance angle, Numerical aperture, Types of fiber, Fiber optic communication system.

(12)

Course Outcomes:

Upon successful completion of this course, the students should be able to:

1. Describe a mathematical wave equation using the principles of waves and oscillations
2. Apply the knowledge for materials testing using Interference, Diffraction & Polarization techniques.
3. Understand the idea of wave function and to solve Schrodinger equation for simple potentials.
4. Explain the role of semiconductors in different realms of physics and their applications in both science and technology.
5. Acquire the basic knowledge of lasers and fiber optics.

Text Books:

1. Engineering Physics –Dr. M.N. Avadhanulu & Dr. P.G. Kshirsagar, S. Chand and Company

2. Engineering Physics –K. Thyagarajan, McGraw Hill Publishers

Reference Books:

1. H. J. Pain, "The physics of vibrations and waves", Wiley, 2006.
2. Physics Vol I & II, Halliday/Resnick/Krane 5th Edition, John Wiley, 2003.
3. B.G. Streetman, "Solid State Electronic Devices", Prentice Hall of India, 1995.
4. Concepts of Modern Physics by Arthur Beiser, 7th Edition, 2017

Mode of Evaluation: Assignment, Mid-term Examinations, and External End Examination.

1. Dr. V. K. Verma (Vverma.)
2. Dr. S. Victor (S.V.)
3. Dr. Lokendra P Singh (LPSingh)
4. Dr M Chandra Sekhar (M. Chandra Sekhar)
5. DR. B. Jagadish Babu (B. Jagadish)
6. Dr. N. Nanda Kumar Reddy (N.N.R.)
7. Dr. S. Sreedhar (Sreedhar)
8. Santosh Kumar Santosh K. Pal
9. Dr. G. Thirupathi. G. Thirupathi.
10. Dr. G. Shwetha G. Shwetha
11.

20PHY201 PHYSICS LABORATORY

L	T	P	C
0	0	3	1.5

Course Description:

Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Course Objectives:

1. Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
2. Illustrate the basics of mechanics, waves and optics to analyze the behavior and characteristics of various materials for its optimum utilization.
3. Develop an ability to apply the knowledge of physics experiments in the later studies.

LIST OF EXPERIMENTS: {Out of 17 experiments any 12 experiments (minimum 10) must be performed in a semester}

1. Spring constant - Coupled Pendulums.
2. Study of resonance effect in series and parallel LCR circuit.
3. Determination of radius of curvature of a curved surface - Newton's Rings.
4. Wavelength of a laser - Diffraction Grating
5. Wavelength of the spectral lines - Diffraction Grating.
6. Magnetic field along the axis of a current carrying coil - Stewart Gees' Apparatus
7. Thickness of a given wire - Wedge Method.
8. Dispersive power of prism – Spectrometer.
9. Frequency of the tuning fork - Melde's apparatus.
10. Determination of particle size using Laser.
11. Width of single slit - Diffraction due to Single Slit.
12. Torsional Pendulum.
13. Determination of the numerical aperture of a given optical fiber and hence to find its acceptance angle.
14. Measurement of e/m of electron (Thomson's method)
15. Energy gap of a material of p-n junction.
16. Determination of Planck's constant.
17. Ferroelectric hysteresis (B-H Curve).

Course Outcomes:

Upon successful completion of this course, the students should be able to:

1. Apply the scientific process in the conduct and reporting of experimental investigations.
2. Understand measurement technology, usage of new instruments and real time applications in engineering studies.

3. Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.
4. Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.
5. Acquire and interpret experimental data to examine the physical laws.

Reference Books:

1. Physics Laboratory Manual
2. Optics, A. Ghatak, 4th Edition, Tata McGraw-Hill, New Delhi 2011.
3. Fundamentals of Optics, F. A. Jenkins and H. E. White, 4th edition, McGraw-Hill Inc., 1981.
4. Engineering Mechanics, 2nd ed. — MK Harbola
5. Introduction to Electrodynamics- David J Griffiths

Mode of Evaluation: Continuous Internal Evaluation, Practical End Examination.

1. Dr. V. K. Verma (Verma.)
2. Dr. S. Victor (SV)
3. Dr. Lokendra P. Singh (Singh)
4. Dr. M. Chandra Sekhar (M. Co Sr)
5. Dr. B. Jagadeesh Babu (B. Jagadeesh)
6. Dr. N. Nanda kumar Reddy (AR).
7. Dr. S. Sreedhar (Sreedhar)
8. Santosh K. Pal Santosh
9. Dr. G. Thirupathi. G. Thirupathi.
10. Dr. G. Shwetha G. Shwetha
11.