



## Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)  
(Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3<sup>rd</sup> Cycle - 3.64 CGPA)  
Dr. N.G.P. – Kalapatti Road, Coimbatore – 641 048, Tamil Nadu, India  
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BoS

14<sup>th</sup>

### MINUTES OF THE FOURTEENTH BOARD OF STUDIES MEETING

Faculty: Basic and Applied Sciences

Board: Physics


The Meeting of Board of Studies (BoS) was held as given below:

Name of the Body	Board of Studies
Department	Physics
Meeting No.	14
Date and Time	25.11.2022 @ 10.00 a.m.
Venue	IQAC Board Room - A1 Block
Members Attended	The details are given in the ANNEXURE -I

Item	AGENDA
01	Discussion on UG syllabi for Part III - Core Courses in second semester for 2022-23 Batch and onwards
02	Discussion on syllabus for Part III - Inter Disciplinary Course (IDC) offered by Department of Mathematics in Second Semester for 2022-23 Batch and onwards
03	Discussion on syllabus for Part III- Inter Disciplinary Course (IDC) offered to Department of Mathematics, Chemistry and Biochemistry in Second Semester for 2022-23 Batch and onwards
04	Discussion on Part I (Tamil/Hindi/French/Malayalam) offered by Language departments for 2022-23 Batch and onwards
05	Discussion on Part II (English) offered by Department of English for 2022-23 Batch and onwards
06	Discussion on Part IV (AECC) Human rights and Women's rights offered by Department of Commerce with Corporate Secretaryship and Basic and Advanced Tamil offered by Department of Tamil respectively for 2022-23 Batch and onwards
07	Discussion on credits for Part V Extension Activity for 2022-23 Batch and onwards
08	Discussion on PG syllabi in second semester courses for 2022-23 Batch and onwards
09	Discussion on PG EDC syllabi in second semester courses for 2022-23 Batch and onwards
10	Discussion on PG DSE syllabi in second semester courses for 2022-23 Batch and onwards
11	Any other matter





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### MINUTES OF THE FOURTEENTH BOARD OF STUDIES MEETING

**Faculty: Basic and Applied Sciences**

**Board: Physics**

The Chairman of BoS welcomed all the Panel members for the meeting. The items listed in the agenda were taken for discussion.

The following are the minutes of the meeting:

<b>Item - 01</b>	<b>Discussion on UG syllabi for Part III - Core Courses in second semester for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<p><b>222PY1A2CA: Heat and Thermodynamics</b></p> <ul style="list-style-type: none"> <li>Prof. Kalaiselvan suggested to include the following topics in Unit-I. Expression for pressure exerted on a Gas, Relation between molar specific heats and degrees of freedom.</li> <li>Prof. Shanthi suggested to add the following topics in, Unit-II: Internal energy (U), Carnot's cycle, Concept of entropy, Change in entropy. Unit-III: Conduction, Rectilinear flow of heat along a bar, Forbes Method to find K, Wiedemann-Franz law Unit-IV: Relation between Celsius, Kelvin, Fahrenheit Scale of temperatures.</li> </ul> <p><b>222PY1A2CB: Atomic Physics (New Course)</b></p> <ul style="list-style-type: none"> <li>Prof. Shanthi, Dr. Kalaiselvan suggested to follow TANSCHÉ for framing the syllabus.</li> </ul> <p><b>222PY1A2CP: Practical - Heat and Thermodynamics</b></p> <ul style="list-style-type: none"> <li>Prof. Shanthi suggested to add experiments relevant to theory.</li> </ul>
<b>Resolution</b>	The Board approved the syllabi.
<b>Item - 02</b>	<b>Discussion on syllabus for Part III - Inter Disciplinary Course (IDC) offered by Department of Mathematics in Second Semester for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<p><b>222MT1A2IP – Statistical Analysis and Tools</b></p> <ul style="list-style-type: none"> <li>Syllabus approved by the Board of Studies in Mathematics was placed for endorsement.</li> </ul>
<b>Resolution</b>	The Board approved the syllabus.
<b>Item-03</b>	<b>Discussion on syllabus for Part III - Inter Disciplinary Course (IDC) offered to Department of Mathematics, Chemistry and Biochemistry in Second Semester for 2022-23 batch and onwards</b>
<b>Discussion</b>	<ul style="list-style-type: none"> <li><b>222PY1A2IP: Applied Physics - I B.Sc. Mathematics and I B.Sc. Chemistry (New Course)</b></li> <li><b>222PY1A2IB : Physics - I. B.Sc. Biochemistry</b></li> </ul>





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	The syllabus offered to other departments was discussed.
<b>Resolution</b>	The Board unanimously approved the syllabi.
<b>Item – 04</b>	<b>Discussion on Part I (Tamil/Hindi/French/Malayalam) offered by Language departments for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<b>Part I: (New Course)</b> <ul style="list-style-type: none"><li>• 221TL1A2TA-Tamil-II: Ara Ilakkiyam</li><li>• 221TL1A2HA-Hindi-II: Modern literature</li><li>• 221TL1A2MA-Malayalam-II: Modern literature</li><li>• 221TL1A2FA- French-II: Grammar, Translation and Civilization, respectively</li></ul> The unified syllabi approved by the Board of Studies in Languages were placed for endorsement.
<b>Resolution</b>	The Board approved the syllabi.
<b>Item -05</b>	<b>Discussion on Part II (English) offered by Department of English for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<b>221EL1A2EA: Part II: Professional English - II</b> <ul style="list-style-type: none"><li>• The syllabus approved by the Board of Studies in English was placed for endorsement.</li></ul>
<b>Resolution</b>	The Board unanimously approved the syllabus.
<b>Item -06</b>	<b>Discussion on Part IV (AECC) Human rights and Women's rights offered by Department of Commerce with Corporate Secretaryship and Basic and Advanced Tamil offered by Department of Tamil respectively for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<b>225CR1A2AA: Human Rights and Women's Rights</b> <ul style="list-style-type: none"><li>• The unified syllabus approved by the Board of Studies in Commerce with Corporate Secretaryship was placed for endorsement.</li></ul> <b>221TL1A2AA - PART- IV: Basic Tamil</b> <b>221TL1A2AB - PART- IV: Advanced Tamil</b> <ul style="list-style-type: none"><li>• The unified syllabi approved by the Board of Studies in Tamil were placed for endorsement.</li></ul>
<b>Resolution</b>	The Board approved the syllabi.
<b>Item-07</b>	<b>Discussion on credits for Part V Extension Activity for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<ul style="list-style-type: none"><li>• One credit to be awarded for each extension activity in NSS/NCC/YRC/ RRC/Yoga/Sports/Clubs</li></ul>
<b>Resolution</b>	The Board members approved one credit for Extension activity.
<b>Item - 8</b>	<b>Discussion on PG syllabi in second semester courses for 2022-23 Batch and onwards</b>
<b>Discussion</b>	The board discussed the syllabus of the following courses offered in second semester.







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	<p><b>222PY2A2CA: Spectroscopy</b></p> <ul style="list-style-type: none"><li>Prof. Shanthi suggested to add following application-oriented topics, Unit- I: Rigid rotator (Diatomic molecules), Intensity of spectral lines Unit -II: Sample handling techniques Unit -III: Raman Investigations of phase transitions Unit-IV: Crystallographic inequivalence</li></ul> <p><b>222PY2A2CB: Solid State Physics (New Course)</b></p> <ul style="list-style-type: none"><li>Prof. Shanthi suggested to include topics related to lattice vibration and band theory from TANSCHÉ.</li></ul> <p><b>222PY2A2CC: Quantum Mechanics-I</b></p> <ul style="list-style-type: none"><li>Prof. Kalaiselvan and Prof. Shanthi suggested to add following topics, to improve skills in problem solving.</li></ul> <p>Unit- I: Schrödinger wave equations, Stationary states, Admissibility conditions of the wave function Unit- II: Free particle, Linear harmonic oscillator: Schrodinger method Unit- III: Commutation relations, Spin angular momentum Unit-IV: Properties of matrix elements, Schrodinger equation in matrix form Unit-V: Scattering cross section, Scattering by a central potential: Partial wave analysis, Breit-Wigner Formula, Scattering length, Expression for phase shifts</p> <p><b>222PY2A2CP: Practical - Solid State and Spectroscopy</b></p> <ul style="list-style-type: none"><li>Mr. Maheswaran suggested to add the following experiments. -Determination of silicon material resistivity using four probe method. -XRD spectrum analysis of a given sample.</li></ul> <p><b>222PY2A2CQ: Practical - Electronics-II</b></p> <ul style="list-style-type: none"><li>Prof. Shanthi and Mr. Maheswaran suggested to add the following experiments -Study the static and drain characteristics of a JFET. -Study the half and full adder, half and full subtractor using ICs. -Study of characteristics of BJT. -Study the characteristics of MOSFET. -Log amplifier using Op-Amp 741.</li></ul>
<b>Resolution</b>	The Board approved the revised syllabi.
<b>Item-9</b>	<b>Discussion on PG EDC syllabi in second semester courses for 2022-23 Batch and onwards</b>
<b>Discussion</b>	<ul style="list-style-type: none"><li><b>222MT2A2EA – Numerical Methods</b></li></ul> <p>Syllabus approved by the Board of Studies in Mathematics was placed for endorsement.</p>
<b>Resolution</b>	The board approved the syllabus.





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<b>Item-10</b>	<b>Discussion on PG DSE syllabi in second semester courses for 2022-23 Batch and onwards</b>
<b>Discussion</b>	Detailed discussion on the following new DSE courses, <ul style="list-style-type: none"><li>• 222PY2A2DA: Physics of Nanomaterials (New Course)</li><li>• 222PY2A2DB: Experimental Design (New Course)</li><li>• 222PY2A2DC: Medical Physics (New Course)</li></ul>
<b>Resolution</b>	The board approved the syllabi.
<b>Item -11</b>	<b>Any other matter</b>
<b>Discussion</b>	<ul style="list-style-type: none"><li>• The board members discussed the Panel of Examiners</li></ul>
<b>Resolution</b>	The Board approved the same

The Chairman of Board of Studies (BoS) thanked all the members for their active participation and provided their valuable suggestions.

Date: 25.11.2022

  
25.11.2022  
(Dr. C. Selvakumar)

BoS Chairman/HoD  
Department of Physics  
Dr. N. G. P. Arts and Science College  
Coimbatore – 641 048





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### Syllabus Revision

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY1A2CA / HEAT AND THERMODYNAMICS**

Unit	Existing	Changes
I	Concept of Ideal gas - Derivation of gas laws - Degrees of freedom - Maxwell's Law of Equipartition of energy - Van der waals equation of state: Correction for Pressure and Correction for Volume - Joule Kelvin effect: Temperature of Inversion.	Expression for pressure exerted on a Gas - Relation between molar specific heats and degrees of freedom.
II	Zeroth Law of thermodynamics - Concept of heat - First law of thermodynamics Specific heats of a gas - Adiabatic process - Isothermal process - Determination of $\gamma$ by Clement and Desorme's method - Second law of thermodynamics - Carnot's theorem.	Internal Energy (U) - Carnot's Cycle - Concept of Entropy- Change in Entropy
III	Entropy of a perfect gas - Third law of thermodynamics - Zero-point energy Coefficient of thermal conductivity - Cylindrical flow of heat - Thermal conductivity of rubber - Thermal conductivity of glass - Thermopile - Properties of thermal radiation.	Conduction - Rectilinear flow of heat along a bar - Forbes Method to find K - Wiedemann-Franz law
IV	Concept of heat and temperature - Types of thermometers - Platinum resistance thermometer - Callender and Griffith's bridge - Peltier effect - Low temperature measurement - High temperature measurement.	Relation between Celsius, Kelvin, Fahrenheit Scale of Temperatures
V	Newton's law of cooling - Specific heat of a liquid: Joule's Electrical method - Calendar and Barnes' continuous flow method - Experimental determination of heat capacities - Two specific heats of a gas - Specific heat of a gas by Joly's differential steam calorimeter.	

**PERCENTAGE OF SYLLABUS REVISED : 35 %**  
**COURSE FOCUSES ON:**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input type="checkbox"/> Social Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





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## Syllabus (New Course)

Faculty: Basic and Applied Sciences

Board: Physics

Semester: II

Course Code / Name: 222PY1A2CB / Atomic Physics

## Syllabus

Unit	Content
I	<b>Positive Rays and mass Spectroscopy</b> Discovery - Properties of Positive Rays - Thomson's Parabola Method - Aston's Mass Spectrograph - Bainbridge's Mass Spectrograph - Dempster Mass Spectrograph - Mass Defect and Packing Fraction - Binding Energy
II	<b>Structure of the Atom</b> Basic Concept of Thomson's atom model - Bohr atom model - Bohr interpretation on hydrogen spectrum - Ritz combination principle - Sommerfeld's relativistic atom model - Vector atom model - Quantum numbers associated with vector atom model. Coupling Schemes: L-S coupling - J-J coupling - The Pauli exclusion principle.
III	<b>Fine Structure of Spectral Lines</b> Critical potential - Atomic excitation - Experimental determination of critical Potential: Franck and Hert'z Method - Davis and Goucher's Method - Optical Spectra: Spectral terms - Spectral notation - Selection rules - Intensity rules - Interval rule - Normal Zeeman Effect: Theory and Experiment - Larmor's Theorem - Anomalous Zeeman Effect - Paschen-Back Effect - Stark Effect.
IV	<b>X-Rays</b> Production of X-Rays - Properties - Absorption of X-Rays - Laue Experiment - Bragg's Law - Bragg's X-Ray Spectrometer - X-Ray Spectra - Characteristic X-Ray Spectra - Moseley's Law and its Importance - Compton Scattering - Theory and Experiment.
V	<b>The Photoelectric Effect</b> Experimental Investigation on the photoelectric effect - Einstein's photoelectric equation - Millikan's experiment - Photoelectric cell - Photo emissive cell - Photovoltaic cell - Photoconductive Cell - Application of photoelectric cell.

PERCENTAGE OF SYLLABUS REVISED : 100 %

COURSE FOCUSES ON:



Skill Development



Entrepreneurial Development



Employability



Innovations



Intellectual Property Rights



Gender Sensitization



Social Awareness/ Environment



Constitutional Rights/ Human Values/ Ethics





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### Syllabus (New Practical)

Faculty: Basic and Applied Sciences

Board: Physics

Semester: II

Course Code / Name: 222PY1A2CP/Core Practical II: Heat and Thermodynamics

Content
1. Determination of thermal conductivity of a bad conductor using Lee's disc method.
2. Calculation of the temperature coefficient of resistance of the given coil using Carey-Foster's bridge.
3. Determination of specific heat capacity of the liquid using Joule's calorimeter.
4. Study the V-I characteristics of a thermistor.
5. Determination of semiconductor resistivity at different temperatures using Four Probe Method.
6. Determination of temperature coefficient of resistance of given wires using Post office box.
7. Study the variation of resistance with temperature using a thermistor.
8. Determination of specific resistance of given coil of wire using Carey-Foster's bridge.
9. Determination of specific resistance of coil using post office box method
10. Determination of temperature coefficient of resistance for unknown resistors.
11. Determination of temperature coefficient of resistance for given copper strip.
12. Determination of band gap energy of a semiconductor using thermal method.

End Semester Practical Examination requires completion of 10 experiments out of 12

**PERCENTAGE OF SYLLABUS REVISED : 100 %**  
**COURSE FOCUSES ON:**



Skill Development



Entrepreneurial Development



Employability



Innovations



Intellectual Property Rights



Gender Sensitization




Social Awareness/ Environment



Constitutional Rights/ Human Values/ Ethics





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### Syllabus (New Course)

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY1A2IP/ Applied Physics**


Unit	Content
I	<b>Properties of matter:</b> Young's Modulus - Rigidity Modulus - Poisson's Ratio - Bending of Beams - Expression for Bending Moment - Measurement of Young's Modulus - Uniform and Non-Uniform Bending. 1 Determine the Young's modulus of a given bar - Uniform bending (Microscopic method) 2 Determine the Young's modulus of given bar - Non Uniform bending (Microscopic method). 3 Determination of rigidity modulus of a string by using static method.
II	<b>Viscosity:</b> Poiseuille's formula for the flow of a liquid through capillary tube - Ostwald's viscometer - Stokes method for coefficient of viscosity of a viscous liquid - Friction and lubrication. 4 Determine the coefficient of viscosity of water by Poiseuille's Method. 5 Determine the coefficient of viscosity of water by Stoke's Method.
III	<b>Surface Tension and vibration:</b> Explanation of surface tension on kinetic theory - Work done in increasing area of a surface - Pressure difference across a liquid surface - Jaegar's method - Transverse and longitudinal modes of vibration - A.C. frequency measurement using sonometer. 6 Determine the surface tension of water by drop weight method. 7 Study the frequency of a tuning fork by sonometer.
IV	<b>Gravitation:</b> Newton's law of gravitation - Kepler's laws of planetary motion - Determination of 'G' Boy's experiment - Variation of g with altitude & depth - Determination of g with compound pendulum. 8 Compound Pendulum - Determination of 'g'. 9 Torsional pendulum - Determination of moment of inertia of given disc.
V	<b>Microprocessors 8085 instruction set:</b> 8085 Machine language - 8085 assembly language - ASCII codes - writing and executing an assembly language program - High level language - Operating system. 10 Write the assembly language program for 8-bit subtraction. 11 Write the assembly language program for 8-bit addition. 12 Write the assembly language program for 8 bit Multiplication.

**PERCENTAGE OF SYLLABUS REVISED  
COURSE FOCUSES ON:**

**: 100 %**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
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### Syllabus Revision

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY1A2IB/ Physics**

Unit	Existing	Changes
I	Young's modulus - Rigidity modulus - Bulk modulus - Modulus - Poisson's ratio (definition) - Bending of beams - Expression for bending moment - Depression of Cantilever - Determination of Y by uniform and non-uniform bending methods - Determination of rigidity modulus by torsional pendulum	Elastic Modulus - Experimental determination of Young's modulus by cantilever depression - Moment of inertia of a disc by torsional pendulum
II	Newton's law of Gravitation - Kepler's laws of planetary motion - Deduction of Newton's law of gravitation from Kepler's laws - Determination of 'G' by Boy's method- Acceleration due to gravity - Determination of 'g' by compound pendulum. Doppler effect - Applications of Doppler effect - Determination of frequency of alternating current by Sonometer	Variation of g with altitude and depth
III	Number system: Decimal - Binary - Conversion of binary to decimal number - Conversion of decimal to binary - Binary addition, subtraction - Logic gates - OR, AND, NOT, XOR, NAND and NOR gates - Verification of truth tables - Laws and theorems of Boolean's algebra - De Morgan's theorems.	
IV	Viscosity - Viscous force - Co-efficient of viscosity - Poiseuille's formula for coefficient of viscosity of a liquid - Determination of coefficient of viscosity using burette - comparison of Viscosities	Stoke's method for coefficient of viscosity of a viscous liquid
V	Interference - Conditions for interference maxima and minima - Air wedge - Determination of thickness of a thin wire by Air wedge method - Diffraction - Difference between diffraction and interference - Theory of transmission grating. Metallic glasses - Shape Memory Alloys - Biomaterials - Applications	Newtons rings - Determination of wavelength using newton's ring

**PERCENTAGE OF SYLLABUS REVISED : 22%**

**COURSE FOCUSES ON:**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
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BoS

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## Syllabus Revision

Faculty : Basic and Applied Sciences

Board : Physics

Semester: II

Course Code / Name: 222PY2A2CA / Spectroscopy

Unit	Existing	Changes
I	<b>Microwave Spectroscopy:</b> Rotation of molecules - Expression for the rotational constant - Theory of microwave spectra of linear and symmetric top molecules - Techniques and instrumentation - Chemical analysis by microwave spectroscopy.	Rigid rotator (diatomic molecules) - Intensity of spectral lines
II	<b>Infrared Spectroscopy:</b> Vibrational energy of a diatomic molecule - Infrared selection rules - Vibrating diatomic molecule - Normal modes of vibration in crystal - Interpretation of vibrational spectra - Group frequencies - IR spectrophotometer instrumentation - Fourier transform infrared spectroscopy (Principle and Working) - Applications.	Sample handling techniques
III	<b>Raman Spectroscopy:</b> Theory of Raman scattering - Rotational Raman spectra - Vibrational Raman spectra - Mutual exclusion principle - Raman spectrometer - Sample handling techniques - Polarization of Raman scattered light - Structure determination using IR and Raman spectroscopy - Resonance Raman scattering. Surface selection rules - SERS microprobe - Applications of SERS.	Raman investigations of phase transitions
IV	<b>Nuclear Magnetic Resonance and Electron Spin Resonance Spectroscopy:</b> Theory of NMR method - Resonance condition - NMR Instrumentation - Relaxation processes - Bloch equations - Chemical shift - Spin-spin coupling - Interpretation of certain NMR spectra. Principle of ESR - ESR spectrometer - Total Hamiltonian - Hyperfine structure - ESR spectra of free radicals in solution.	
V	<b>Nuclear Quadrupole Resonance and Mossbauer Spectroscopy:</b> Principle of nuclear quadrupole resonance - Transitions for axially and non-axially symmetric systems - NQR instrumentation - Chemical bonding - Hydrogen bonding. The Mossbauer effect - Recoilless emission and absorption - Experimental techniques - Isomer shift - Quadrupole Interaction - Magnetic hyperfine interaction - Applications. <del>Electron energy loss spectroscopy (EELS) - Reflectance absorbance IR spectroscopy (RAIRS) - Photo electron spectroscopy (PES) - X-ray photo electron spectroscopy (XPES). Surfaces for SERS study - Enhancement mechanism</del>	Crystallographic inequivalence.

PERCENTAGE OF SYLLABUS REVISED :22 %

COURSE FOCUSES ON:

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Skill Development            | <input checked="" type="checkbox"/> Entrepreneurial Development      |
| <input checked="" type="checkbox"/> Employability                | <input checked="" type="checkbox"/> Innovations                      |
| <input checked="" type="checkbox"/> Intellectual Property Rights | <input type="checkbox"/> Gender Sensitization                        |
| <input type="checkbox"/> Social Awareness/ Environment           | <input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics |







# Dr. N.G.P. ARTS AND SCIENCE COLLEGE

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Web : www.drngpasc.ac.in | Email : info@drngpasc.ac.in | Phone : +91-422-2369100

BoS

14<sup>th</sup>

## Syllabus (New Course)

Faculty: Basic and Applied Sciences

Board : Physics

Semester: II

Course Code / Name: 222PY2A2CB/ SOLID STATE PHYSICS

## Syllabus

Unit	Content
I	<b>Fundamentals of Crystallography and Bonding in solids:</b> Crystalline state - Bravais lattices and crystal systems - Elements of symmetry - Crystal directions - Miller indices - Simple Crystal structures (NaCl, CsCl, Hexagonal close packed structure, Diamond structure, Cubic ZnS structure). Forces between atoms - Ionic bonding - The Born-Haber Cycle - Covalent bonding - Metallic bonding - Hydrogen bonding - Van Der Waals bonding
II	<b>Crystal Structure and Binding:</b> Diffraction of X-Rays by simple lattice array of atom - Bragg's law - Correction for Bragg's equation - Laue method - Rotating crystal method - Powder photograph method - Diffraction of electrons - Diffraction of neutrons - Laue derivation of amplitude of scattered wave - Reciprocal lattice - Properties of reciprocal lattice - Reciprocal lattice to BCC & FCC lattice.
III	<b>Crystal Imperfections and Atomic Diffusion:</b> Point imperfections - Concentrations of Vacancy, Frenkel and Schottky imperfections - Line Imperfections - Burgers Vector - Presence of dislocation - Surface imperfections - Polarons - Excitons. Ficks first and second law - Diffusion mechanism - Applications of diffusion - Kirkendall effect.
IV	<b>Lattice Vibration and Thermal Properties:</b> Elastic vibrations of continuous media - Theory of wave motion of one dimensional atomic lattice - Group and phase velocity - Phonons - Phonon momentum - Inelastic scattering of neutron by phonons. Thermal properties: Einstein's theory of specific heat - Anharmonic crystal interactions - Lattice thermal conductivity of solids.
V	<b>Free Electron and Band Theory:</b> Failure of classical free electron theory - Fermi-Dirac distribution - Matthiessen's rule - Magnetoresistance. Bloch theorem - Kronig - Penney model - Extended, Reduced and periodic zone schemes - Tight binding approximation - Brillouin Zone - Construction of Fermi surfaces - De Haas-van Alphen effect.

PERCENTAGE OF SYLLABUS REVISED : 100 %

COURSE FOCUSES ON:



Skill Development



Entrepreneurial Development



Employability



Innovations



Intellectual Property Rights



Gender Sensitization




Social Awareness/ Environment



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### Syllabus Revision

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY2A2CC / Quantum Mechanics -I**

Unit	Existing	Changes
I	<b>Unit I: Foundations of Quantum Mechanics:</b> Postulates of quantum mechanics - Interpretation of the wave function - Probability of interpretation - Current density - Expectation value - Ehrenfest's theorem - Linear operator - Eigen values and functions – Hermitian Operator - Dirac's notation - Momentum Representation: Operator for momentum	Schrödinger wave equations - Stationary states - Admissibility conditions of the wave function
II	<b>Unit II: One Dimensional Energy Eigen value Problems:</b> Equation of motion: Schrödinger, Heisenberg and Interaction representation - Square well potential with rigid walls - Square well potential with finite walls - Square well potential barrier - Alpha emission.	Free particle - Linear harmonic oscillator: Schrodinger method
III	<b>Unit III: Three-Dimensional Problems and Angular Momentum:</b> particle in a spherical symmetric potential - Rigid Rotator - Hydrogen atom - Angular momentum operator – Eigen value and Eigen function of L <sup>2</sup> and L <sub>z</sub> – Eigen value of J <sup>2</sup> and J <sub>z</sub> - Addition of angular momenta - Clebsch Gordan coefficients, Recursion Relations.	Commutation relations - Spin angular momentum
IV	<b>Unit IV: Heisenberg Method and Many Electron Atoms:</b> The Heisenberg method - Matrix representation of wave function and operator – Eigen value problems – Unitary transformation - Linear harmonic oscillator in matrix method - Pauli's principle- Inclusion of spin – Spins functions for two electrons and three electrons.	Properties of matrix elements - Schrodinger equation in matrix form
V	<b>Unit V: Scattering Theory:</b> Scattering by a perfectly rigid sphere - Scattering by a coulomb field- Green's functions – Born approximation and its validity – Scattering by a square well potential – Scattering from an exponential potential.	Scattering cross section – Scattering by a central potential: Partial wave analysis – Scattering length - Expression for phase shifts - Breit - Wigner Formula


**PERCENTAGE OF SYLLABUS REVISED :46 %**

**COURSE FOCUSES ON:**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
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### Syllabus Revision

Faculty : Basic and Applied Sciences

Board : Physics

Semester: II

Course Code / Name: 222PY2A2CP / Core Practical -III : Solid State and Spectroscopy

Sl. No	Existing	Changes
1	Determination of optical activity of specific rotation using Polarimeter.	
2	Determination of refractive index of liquid using He-Ne laser	
3	Determination of e /m by Thomson method	
4	Determination of Rydberg's constant using Solar spectrum	
5	Determination of e/m by Magnetron method.	
6	Determination of Hall coefficient, mobility, Hall angle and number of charge carriers by using Hall setup.	
7	Study the band gap energy using Thermistor.	
8	Determination of Resistivity using Two probe method	Determination of resistivity and band gap using four probe method for given materials.
9	Determination of refractive index of liquid by Newton's ring.	
10	Study of dielectric constant and Curie temperature of magnetic materials	XRD spectrum analysis of the given sample.
11	Determination of viscosity using liquid –Mayer's disc method.	
12	Estimate the band gap and particle size of a material from a given UV-Visible spectrograph.	

End Semester Practical Examination requires completion of 10 experiments out of 12

**PERCENTAGE OF SYLLABUS REVISED**  
**COURSE FOCUSES ON:**

**: 33 %**

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|--|--|
| <input checked="" type="checkbox"/> Skill Development            | <input checked="" type="checkbox"/> Entrepreneurial Development      |
| <input checked="" type="checkbox"/> Employability                | <input checked="" type="checkbox"/> Innovations                      |
| <input checked="" type="checkbox"/> Intellectual Property Rights | <input type="checkbox"/> Gender Sensitization                        |
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14<sup>th</sup>

### Syllabus (New Practical)

Faculty: Basic and Applied Sciences

Board : Physics

Semester: II

Course Code / Name: 222PY2A2CQ /Core Practical: Electronics II

#### Content

1. Construction of Colpitt's oscillator using Op-Amp
2. Study the Schmitt trigger using OP-Amp
3. Study the static and drain characteristics of a JFET.
4. Construction of Analog to Digital conversion using IC 74148
5. Construction of inverting, non-inverting and voltage follower using Op-Amp
6. Study the half adder, full adder, half subtractor and full subtractor using ICs.
7. Construction of bistable multivibrator using OP-Amp 741/NE 555.
8. Study the characteristics of BJT.
9. Study the characteristics of MOSFET.
10. Construction of logarithmic amplifier using Op-Amp 741.
11. Construction of second order low and high pass filters using IC 741
12. Construction of an astable multivibrator using IC 741.

End Semester Practical Examination requires completion of 10 experiments out of 12

**PERCENTAGE OF SYLLABUS REVISED**  
**COURSE FOCUSES ON:**

**: 100 %**

☒ Skill Development

☒ Entrepreneurial Development

☒ Employability

☒ Innovations

☒ Intellectual Property Rights


☐ Gender Sensitization

☐ Social Awareness/ Environment

☐ Constitutional Rights/ Human Values/ Ethics





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### Syllabus (New Course)

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY2A2DA/ Physics of Nanomaterials**


### Syllabus

Unit	Content
I	<b>Classification of Nanomaterials:</b> Definition of Zero, one, two and three dimension nanomaterials – Surface energy – Chemical potential as a function of surface curvature – Electrostatic stabilization: Surface charge density - DLVO theory - Steric stabilization: solvent and polymer.
II	<b>Special Nanomaterials:</b> Carbon Fullerenes and Nanotubes: Carbon fullerenes, Fullerene derived crystals, Carbon nanotubes - Micro and Mesoporous Materials: Ordered mesoporous structures - Random mesoporous structures - Crystalline microporous materials: zeolites - Organic-inorganic hybrids: Class 1 hybrids - Class 2 hybrids.
III	<b>Properties:</b> Physical properties of nanomaterials: Melting points and lattice constants – Mechanical properties – Optical properties: Surface Plasmon Resonance – Quantum size effects – Electrical property: Surface scattering - Change of electronic structure - Quantum transport - Effect of microstructure.
IV	<b>Synthesis:</b> Physical vapour deposition: Evaporation - Molecular beam epitaxy - Sputtering - Chemical vapour deposition: Typical chemical reaction - Reaction kinetics - CVD methods - Atomic layer deposition - Superlattices - Sol-Gel Films.
V	<b>Characterization:</b> Structural Characterization: X-Ray diffraction – Scanning electron Microscopy – Transmission Electron Microscopy - Scanning probe microscopy – Chemical Characterization: Optical spectroscopy - Electron spectroscopy - Ion spectroscopy.

**PERCENTAGE OF SYLLABUS REVISED : 100 %**  
**COURSE FOCUSES ON:**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input type="checkbox"/> Social Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics



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### Syllabus (New Course)

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY2A2DB/ Experimental Design**

### Syllabus


Unit	Content
I	<b>Concepts of Measurements and Error:</b> Measurement - Instrumentation - Classification of instruments - Factors relating to selection of instruments - Functions of instruments - Accuracy, errors and correction - Application of measurement system - Limiting errors - Types of errors - Sources of errors.
II	<b>Electronic and Digital Instruments:</b> Essentials of an electronic instrument - Advantages - Electronic voltmeter – Types of electronic voltmeters - Vacuum tube voltmeters - Differential voltmeter (D.C.) - Analog and Digital system - Basic concepts of digital instruments - Digital voltmeter - Advantages - Characteristic - Application.
III	<b>Transducers:</b> Classification of transducers - Resistive, Inductive & Capacitive pressure transducer - Linear variable differential transformer (LVDT) – Piezoelectric Transducer - Photoelectric Transducers - Carbon microphone - Ribbon microphone - Moving coil microphone - crystal microphone.
IV	<b>Fibre optics:</b> Structure of optical fibres - Classification of optical fibre - Propagation of light – Total Internal reflection - Fibre characteristics- Splicing and connector - fusion splices - fibre optic communications - Advantage and disadvantage - Application of fibre optic communication.
V	<b>Optoelectronic devices:</b> Spectral response of human eye - Light emitting diode - Photoemissive devices - Photomultiplier tube - Photovoltaic devices - Type photoconductive cells - photodiodes - PN junction - PIN - Avalanche photodiode.

**PERCENTAGE OF SYLLABUS REVISED : 100 %**  
**COURSE FOCUSES ON:**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
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### Syllabus (New Course)

**Faculty : Basic and Applied Sciences**

**Board : Physics**

**Semester: II**

**Course Code / Name: 222PY2A2DC/ Medical Physics**

### Syllabus

Unit	Content
I	<b>X-Rays:</b> Electromagnetic spectrum - Production of x-rays - X-ray spectra – Brehmsstrahlung - Characteristic x-ray - X-ray tubes - Coolidge tube - X-ray tube design – Tube cooling- Stationary Mode-Rotating anode x-ray tubes - Quality and intensity of x- ray. X-ray generator circuits - Half wave and full wave rectification - Filament circuit - Kilo voltage circuit.
II	<b>Radiation Physics:</b> Radiation units - Exposure - Absorbed dose - Rad gray - Kera relative biological effectiveness - Effective dose - Inverse square law - Interaction of radiation with matter - Radiation Detectors - Thimble chamber- Condenser chambers – Geiger counter - Ionization chamber - Dosimeters - Survey methods - TLD and semiconductor detectors.
III	<b>Medical Imaging Physics:</b> Radiological imaging - Radiography - Filters - Grids - Cassette - X-ray film – Film processing - Fluoroscopy - Computed tomography scanner - Generations - mammography. Ultrasound imaging - Magnetic resonance imaging – Thyroid uptake system - Gamma camera (Only Principle, function, and display).
IV	<b>Radiation Therapy Physics:</b> Radiotherapy - Kilo voltage machines - Deep therapy machines - Tele-cobalt machines - Basics of Teletherapy units - Medical linear accelerator – Radiation protection - External beam characteristics - Phantom - Dose maximum and build up - Bolus - Percentage depth dose - Tissue - Air ratio - Back scatter factor.
V	<b>Radiation Protection:</b> Principles of radiation protection - Protective materials - Radiation effects - Somatic, genetic stochastic and deterministic effect, Personal monitoring devices - TLD film badge - Pocket dosimeter.

**PERCENTAGE OF SYLLABUS REVISED : 100 %**  
**COURSE FOCUSES ON:**

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input type="checkbox"/> Social Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics



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		<p style="text-align: center;"><b>14<sup>th</sup></b></p>

### ATTENDANCE OF THE THIRTEENTH BOARD OF STUDIES MEETING

**Faculty: Basic and Applied Sciences**



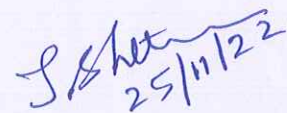
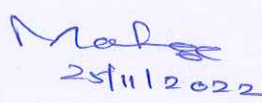

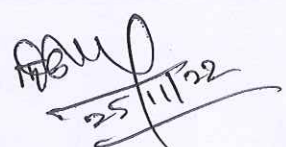
**Board: Physics**

**Venue : IQAC, Board Room –A1 Block**

**Date : 25/11/2022**

**Time : 10:00 AM**

The following members were present for the board of studies meeting.

S. No.	Name	Designation	Signature
1	<b>Dr. C. Selvakumar</b> Professor and Head Department of Physics Dr.N.G.P. ASC	Chairman	 25/11/22
2	<b>Dr. R. Kalaiselvan</b> Assistant Professor Department of Physics Bharathiar University Coimbatore-46	VC Nominee	 25/11/2022
3	<b>Dr. J. Shanthi</b> Professor and Head Department of Physics Avinashilingam Institute of Home Science Coimbatore -43.	Subject Expert	 25/11/22
4	<b>Dr K S Rajini,</b> Associate Professor Department of sciences School of Engineering Home Science Coimbatore-43	Subject Expert	ABSENT.
5	<b>Mr. G. Maheswaran</b> Chief Executive Officer Silicon Technologies Coimbatore - 14.	Industrial Expert	 25/11/2022
6	<b>Ms. A. Suvathini</b> Junior Assistant Commercial Tax Office Tiruppur - 02.	Alumni	 25/11/2022
7	<b>Dr. N. Kuppusamy</b> Professor and Head Department of Tamil Dr. N.G.P. ASC	Co-opted Member	 25/11/22





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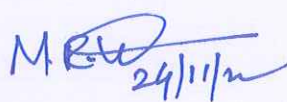
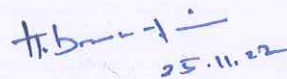
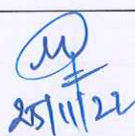

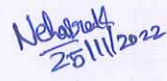
14<sup>th</sup>

8	<b>Dr. R. Vidya Prabha</b> Professor and Head Department of English Dr. N.G.P. ASC	Co-opted Member	R.V. - L.C. 25/11/22
9	<b>Dr. R. Sowrirajan</b> Assistant Professor and Head Department of Mathematics Dr. N.G.P. ASC	Co-opted Member	# [Signature] 25/11/22
10	<b>Dr. M. Suganthi</b> Assistant Professor and Head Department of Chemistry Dr. N.G.P. ASC	Co-opted Member	M. Suganthi 25-11-22
11	<b>Dr. V. Gopala Krishnan</b> Professor Department of Physics Dr. N.G.P. ASC	Member	[Signature] 25/11/22
12	<b>Dr. M. R. Ananthan</b> Associate Professor Department of Physics Dr. N.G.P. ASC	Member	M.R. - L.A. 25/11/22
13	<b>Mrs. R. Revathi</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	[Signature] 25/11/22
14	<b>Dr. R. Karunathan</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	R.L. 25/11/22
15	<b>Dr. S. S. Kanmani</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	[Signature] 25/11/22
16	<b>Dr. K. Girija</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	K.G. - L.A. 25/11/22
17	<b>Dr. R. Dilip</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	[Signature] 25/11/22





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18	<b>Dr M.R Venkatraman</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	 24/11/22
19	<b>Dr S Gunasekaran</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	 25.11.22
20	<b>Ms. Mercy Dayana</b> Assistant Professor Department of Physics Dr. N.G.P. ASC	Member	 25/11/22
21	<b>UG:Ms. G. Sharmila</b> III B.Sc. Physics Department of Physics Dr. N.G.P. ASC	Student Representative	 25/11/22
22	<b>PG: Ms. Nehasree K</b> II M.Sc. Physics Department of Physics Dr. N.G.P. ASC	Student Representative	 25/11/2022

Date: 25/11/2022



  
 25/11/2022  
 (Dr. C. Selva Kumar)

**Dr. C. SELVAKUMAR**  
 M.Sc., M.Ed., Ph.D  
 Head, Dept. of Physics  
 Dr. N.G.P. Arts and Science College  
 Dr. N.G.P. - Kalapatti Road, Coimbatore - 48.

