

B.SC PHYSICS

SYLLABUS

PROGRAM CODE: USPH

2023-2024 ONWARDS



**PG & RESEARCH DEPARTMENT OF
PHYSICS**

**GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
KUMBAKONAM-612 001**

GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS) KUMBAKONAM-612001
(Curriculum – B.Sc., PHYSICS – 2023 – 2024)

Department: Physics

Program Code: USPH

FIRST YEAR

SEMESTER – I

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
I	LC-I	U231T1	Tamil	6	3	3	25	75	100
II	ELC-I	U231E1	English	6	3	3	25	75	100
III	CC – I	U23PC101	Properties of Matter and Sound	5	5	3	25	75	100
III	CC – II	U23PC102P	Physics Core Practical I	3	2	3	40	60	100
III	GEC - I	U23MGE1	Calculus and Fourier series	6	5	3	25	75	100
IV	VE	U231VE	Value Education	2	2	3	40	60	100
IV	FC	U23P1FC	Introductory Physics	2	2	3	25	75	100
Total				30	22				700

SEMESTER – II

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
I	LC-II	U232T2	Tamil	6	3	3	25	75	100
II	ELC-II	U232E2	English	6	3	3	25	75	100
III	CC – III	U23PC203	Heat, Thermodynamics and Statistical Physics	5	5	3	25	75	100
III	CC -IV	U23PC204P	Physics Core Practical II	3	2	3	40	60	100
III	GEC - II	U23MGE2	Algebra,ODE and Trigonometry	6	5	3	25	75	100
IV	SEC -I	U23P2SE1	Physics of Everyday Life	2	2	3	25	75	100
IV	EVS	U232ES	Environmental Studies	2	2	3	25	75	100
Total				30	22				700

CC I - PROPERTIES OF MATTER AND SOUND						I YEAR - FIRST SEMESTER		
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U23PC101	PROPERTIES OF MATTER AND SOUND	CC I				5	5	75
Study of the properties of matter leads to information which is of practical value to both physicists and the engineers. It gives us information about the internal forces which act between the constituent parts of the substance. Students who undergo this course are successfully bound to get a better insight and understanding of the subject								

UNIT-I ELASTICITY

Hooke's law – stress-strain diagram – elastic constants –Poisson's ratio – relation between elastic constants and Poisson's ratio – work done in stretching and twisting a wire – twisting couple on a cylinder – rigidity modulus by static torsion– torsional pendulum (with and without masses)

UNIT-II BENDING OF BEAMS

cantilever– expression for Bending moment – expression for depression at the loaded end of the cantilever– oscillations of a cantilever – expression for time period – experiment to find Young's modulus – non-uniform bending– experiment to determine Young's modulus by Koenig's method – uniform bending – expression for elevation – experiment to determine Young's modulus using microscope-Application of I-form Griders.

UNIT-III FLUID DYNAMICS

Surface tension: definition – molecular forces– excess pressure over curved surface – application to spherical and cylindrical drops and bubbles – determination of surface tension by Jaegar's method–variation of surface tension with temperature

Viscosity: definition – streamline and turbulent flow – rate of flow of liquid in a capillary tube – Poiseuille's formula –corrections – terminal velocity and Stoke's formula– variation of viscosity with temperature-Application of surface tension and viscosity- Application to Blood Pressure.

UNIT-IV WAVES AND SCILLATIONS: Simple Harmonic Motion (SHM) – differential equation of SHM – graphical representation of SHM – composition of two

SHM in a straight line and at right angles – Lissajous's figures- free, damped, forced vibrations –resonance and Sharpness of resonance.

Laws of transverse vibration in strings –sonometer – determination of AC frequency using sonometer –determination of frequency using Melde's string apparatus.

UNIT-V ACOUSTICS OF BUILDINGS AND ULTRASONICS:

Intensity of sound – decibel – loudness of sound –reverberation – Sabine's reverberation formula – acoustic intensity – factors affecting the acoustics of buildings.

Ultrasonic waves: production of ultrasonic waves – Piezoelectric crystal method – magnetostriction effect – application of ultrasonic waves.

BOOKS FOR STUDY:

1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand & Co.
2. BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S.Chand & Co
3. D.R.Khanna & R.S.Bedi, 1969, Textbook of Sound, AtmaRam & sons.
4. BrijLal and N.Subrahmanyam, 1995, A Text Book of Sound, Second revised edition, Vikas Publishing House.
5. R.Murugesan, 2012, Properties of Matter, S.Chand & Co.

REFERENCE BOOKS

1. C.J. Smith, 1960, General Properties of Matter, Orient Longman Publishers
2. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, R. Chand & Co.
3. A.P French, 1973, Vibration and Waves, MIT Introductory Physics, Arnold-Heinmann India.

WEBLINKS

1. <https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>
2. <http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>
3. <https://www.youtube.com/watch?v=gT8Nth9NWPM>
4. <https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s>
5. <https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>
6. <https://learningtechnologyofficial.com/category/fluid-mechanics-lab/>
7. <http://www.sound-physics.com/>
8. <http://nptel.ac.in/courses/112104026/>

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Relate elastic behavior in terms of three moduli of elasticity and working of torsion pendulum.
CO2	Able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials.
CO3	Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface, soap films provide an analogue solution to many engineering problems.
CO4	Analyze simple harmonic motions mathematically and apply them. Understand the concept of resonance and use it to evaluate the frequency of vibration. Set up experiment to evaluate frequency of ac mains
CO5	Understand the concept of acoustics, importance of constructing buildings with good acoustics. Able to apply their knowledge of ultrasonics in real life, especially in medical field and assimilate different methods of production of ultrasonic waves

MAPPING WITH PROGRAM OUT COMES:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓	✓			✓			✓		✓
CO2		✓	✓	✓			✓		✓	✓
CO3	✓		✓		✓	✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓		✓			
CO5			✓	✓		✓	✓	✓	✓	

CC II - PHYSICS CORE PRACTICAL I						I YEAR - FIRST SEMESTER		
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U23PC102P	PHYSICS CORE PRACTICAL I	CC II				5	5	60
Apply various physics concepts to understand Properties of Matter, set up experimentation to verify theories, quantify and analyze, able to do error analysis and correlate results								

(Any Eight Experiments)

1. Determination of rigidity modulus without mass using Torsional pendulum.
2. Determination of rigidity modulus with masses using Torsional pendulum.
3. Determination of moment of inertia of an irregular body.
4. Verification of parallel axes theorem on moment of inertia.
5. Verification of perpendicular axes theorem on moment of inertia.
6. Determination of moment of inertia and g using Bifilar pendulum.
7. Determination of Young's modulus by stretching of wire with known masses.
8. Verification of Hook's law by stretching of wire method.
9. Determination of Young's modulus by uniform bending – load depression graph. – Pin and Microscope
10. Determination of Young's modulus by non-uniform bending – load depression graph. – Pin and Microscope
11. Determination of Young's modulus by cantilever – load depression graph.
12. Determination of Young's modulus by cantilever – oscillation method
13. Determination of Young's modulus by Koenig's method – (or unknown load)
14. Determination of rigidity modulus by static torsion.
15. Determination of Y, n and K by Searle's double bar method.
16. Determination of surface tension by drop weight method.
17. Determination of surface tension by Capillary rise method.
18. Determination of interfacial surface tension between two liquids by drop weight method.

19. Determination of co-efficient of viscosity by Stokes' method – terminal velocity.
20. Determination of critical pressure for streamline flow.
21. Determination of Poisson's ratio of rubber tube.
22. Determination of viscosity by Poiseuille's flow method.
23. Determination radius of capillary tube by mercury pellet method.
24. Determination of g using compound pendulum.

METHOD OF EVALUATION

Continuous Internal Assessment	End Semester Examination	Total	Grade
40	60	100	

VE - VALUE EDUCATION			I YEAR - FIRST SEMESTER					
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U231VE	VALUE EDUCATION	VE				2	2	60

UNIT-I முன்னுரை-விழுமியகல்வி

1. வாழ்வியல்விழுமியங்கள்
2. விழுமியங்களின்வகைகள்
3. வாழ்வியல்விழுமியங்களைபாதிக்கும்காரணிகள்.
4. விழுமியக்கல்வியின்அவசியம்

UNIT-II நன்னடத்தைகள்

1. பெற்றோரைமதித்தல்
2. ஆசிரியரைமதித்தல்
3. இறைவழிபாடு
4. சுயமதிப்பு

UNIT-III சமூகம்சார்ந்தமதிப்புகள்

1. ஒற்றுமை
2. சமத்துவம். சகோதரத்துவம்
3. குடும்பம்
4. குடிமக்களின்கடமைகள். தேசபக்தி

UNIT-IV உடல்நலம்மனநலம்

1. உணவுஒழுக்கம்
2. தனிமனிதசுகாதாரம்
3. மகளிர்ஆரோக்யம்
4. எண்ணங்களின்வலிமை

UNIT-V சீர்கேடுகளும்சீர்திருத்தங்களும் சீர்கேடுகளும்

1. வாழ்க்கை விழுமியங்கள் மற்றும் அறங்களில் உலகமயமாதலின் பாதிப்பு
2. ஊடகங்களின்பாதிப்பு. சீர்திருத்தங்கள்
3. மனக்கட்டுப்பாடு விருப்பங்களை நெறிப்படுத்துதல்
4. உடற்பயிற்சி தியானம் யோகா

FOUNDATION COURSE - INTRODUCTORY PHYSICS						I YEAR - FIRST SEMESTER		
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U23P1FC	INTRODUCTORY PHYSICS	FC				2	2	75
To help students get an overview of Physics before learning their core courses. To serve as a bridge between the school curriculum and the degree programme								

UNIT-I

Vectors, scalars –examples for scalars and vectors from physical quantities – addition, subtraction of vectors – resolution and resultant of vectors – units and dimensions– standard physics constants

UNIT-II

Different types of forces–gravitational, electrostatic, magnetic, electromagnetic, nuclear –mechanical forces like, centripetal, centrifugal, friction, tension, cohesive, adhesive forces.

UNIT-III

Different forms of energy– conservation laws of momentum, energy – types of collisions –angular momentum– alternate energy sources–real life examples

UNIT-IV

Types of motion– linear, projectile, circular, angular, simple harmonic motions – satellite motion – banking of a curved roads – stream line and turbulent motions – wave motion – comparison of light and sound waves – free, forced, damped oscillations.

UNIT-V

Surface tension – shape of liquid drop – angle of contact – viscosity –lubricants – capillary flow – diffusion – real life examples– properties and types of materials in daily use- conductors, insulators – thermal and electric.

BOOKS FOR STUDY:

1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand & Co
2. BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S.Chand & Co.

REFERENCEBOOKS

1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S.Chand & Co.

WEBLINKS

1. <http://hyperphysics.phyastr.gsu.edu/hbase/permot2.html><https://science.nasa.gov/e/ms/>
2. https://eesc.columbia.edu/courses/eesc/climate/lectures/radiation_hays/

COURSEOUTCOMES:

At the end of the course, the student will be able to:

CO1	Apply concept of vectors to understand concepts of Physics and solve problems
CO2	Appreciate different forces present in Nature while learning about phenomena related to these different forces.
CO3	Quantify energy in different process and relate momentum, velocity and energy
CO4	Differentiate different types of motions they would encounter in various courses and understand their basis
CO5	Relate various properties of matter with their behaviour and connect them with different physical parameters involved.

MAPPING WITH PROGRAM OUTCOMES:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓	✓	✓	✓	✓	✓	✓		✓	
CO2		✓	✓	✓		✓	✓			
CO3	✓	✓	✓		✓	✓	✓		✓	
CO4	✓	✓	✓	✓	✓	✓	✓			
CO5	✓		✓	✓	✓	✓	✓			✓

CC III- HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS						I YEAR – SECOND SEMESTER		
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U23PC203	HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS	CC III				5	5	75
The course focuses to understand a basic in conversion of temperature in Celsius, Kelvin and Fahrenheit scales. Practical exhibition and explanation of transmission of heat in good and bad conductor. Relate the laws of thermodynamics, entropy in everyday life and explore the knowledge of statistical mechanics and its Relation.								

UNIT-I CALORIMETRY

Specific heat capacity – specific heat capacity of gases C_p & C_v – Meyer's relation.

LOW TEMPERATURE PHYSICS: Joule-Kelvin effect – porous plug experiment – Joule-Thomson effect – Boyle temperature – Temperature of inversion – liquefaction of gas by Linde's Process – adiabatic demagnetization. Practical application of Low temperature-Refrigerating mechanism, Air conditioning machine.

UNIT-II THERMODYNAMICS-I

Zeroth law and first law of thermodynamics – P-V diagram – heat engine – efficiency of heat engine – Carnot's engine, construction, working and efficiency of petrol engine and diesel engines – comparison of engines.

UNIT-III THERMODYNAMICS-II

Second law of thermodynamics – entropy of an ideal gas – entropy change in reversible and irreversible processes – T-S diagram – thermo dynamical scale of temperature – Maxwell's thermo dynamical relations – Clausius- Clapeyron's equation (first latent heat equation) – third law of thermodynamics – unattainability of absolute zero – heat death.

UNIT-IV HEAT TRANSFER

Modes of heat transfer: Conduction, Convection and Radiation. **Conduction:** Thermal conductivity – determination of thermal conductivity of a good conductor by Forbe's method – determination of thermal conductivity of a bad conductor by Lee's disc method.

Radiation: Black body radiation (Ferry's method) – distribution of energy in black body radiation – Wien's law and Rayleigh Jean's law – Planck's law of Stefan's law – deduction of Newton's law of cooling from Stefan's law.

UNIT-V STATISTICAL MECHANICS

Definition of phase-space – micro and macro states – ensembles – different types of ensembles – classical and quantum Statistics – Maxwell-Boltzmann statistics – expression for distribution function – Bose-Einstein statistics – expression for distribution function – Fermi-Dirac statistics – expression for distribution function – comparison of three statistics.

BOOKS FOR STUDY:

1. Brijlal & N. Subramaniam, 2000, Heat and Thermodynamics, S.Chand & Co.
 2. Narayanamoorthy & Krishna Rao, 1969, Heat, Triveni Publishers, Chennai.
 3. V.R.Khanna & R.S.Bedi, 1998 1st Edition, Text book of Sound, Kedharnaath Publish & Co, Meerut
 4. Brijlal and N. Subramanyam, 2001, Waves and Oscillations, Vikas Publishing House, New Delhi.
 5. Ghosh, 1996, Text Book of Sound, S.Chand & Co.
- R.Murugesan & Kiruthiga Sivaprasath, Thermal Physics, S.Chand & Co.

REFERENCE BOOKS

1. J.B.Rajam & C.L.Arora, 1976, Heat and Thermodynamics, 8th edition, S.Chand & Co. Ltd.
2. D.S.Mathur, Heat and Thermodynamics, Sultan Chand & Sons.
3. Gupta, Kumar, Sharma, 2013, Statistical Mechanics, 26th Edition, S. Chand & Co.
4. Resnick, Halliday & Walker, 2010, Fundamentals of Physics, 6th Edition. Sears, Zemansky, Hugh D. Young, Roger A. Freedman, 2021 University Physics with Modern Physics 15th Edition, Pearson.

WEBLINKS

1. https://youtu.be/M_5KYncYNyc
2. <https://www.youtube.com/watch?v=4M72kQulGKk&vI=en>

METHOD OF EVALUATION

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Acquires knowledge on how to distinguish between temperature and heat. Introduce him/her to the field of thermometry and explain practical measurements of high temperature as well as low temperature physics. Student identifies the relationship between heat capacity, specific heat capacity. The study of Low temperature Physics sets the basis for the students to understand cryogenics, superconductivity, super fluidity and Condensed Matter Physics
CO2	Derive the efficiency of Carnot's engine. Discuss the implications of the laws of Thermodynamics in diesel and petrol engines
CO3	Able to analyze performance of thermodynamic systems viz efficiency by problems. Gets an insight into thermodynamic properties like enthalpy, entropy
CO4	Study the process of thermal conductivity and apply it to good and bad conductors. Quantify different parameters related to heat, relate them with various physical parameters and analyse them
CO5	Interpret classical statistics concepts such as phase space, ensemble, Maxwell-Boltzmann distribution law. Develop the statistical interpretation of Bose-Einstein and Fermi-Dirac . Apply to quantum particles such as photon and electron

MAPPING WITH PROGRAM OUT COMES:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓	✓	✓	✓	✓	✓	✓		✓	
CO2		✓	✓	✓		✓	✓			
CO3	✓	✓	✓		✓	✓	✓		✓	
CO4	✓	✓	✓	✓	✓	✓	✓			
CO5	✓	✓		✓	✓	✓			✓	

CC IV - PHYSICS CORE PRACTICAL II						I YEAR – SECOND SEMESTER		
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U23PC204P	PHYSICS CORE PRACTICAL II	CC IV				2	3	60
Apply their knowledge gained about the concept of heat and sound waves, resonance, calculate frequency of ac mains set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results								

Any Eight of the below list

1. Determination of specific heat by cooling –Newton’s law graphical method.
2. Determination of thermal conductivity of good conductor by Forbe’s method.
3. Determination of thermal conductivity of bad conductor by Lee’s disc method.
4. Determination of thermal conductivity of bad conductor by Charlton’s method.
5. Determination of specific heat capacity of solid.
6. Determination of specific heat of liquid by Joule’s electrical heating method (applying radiation correction by Barton’s correction/graphical method),
7. Determination of Latent heat of a vaporization of a liquid.
8. Verification of Stefan’s- Boltzman’s law.
9. Determination of thermal conductivity of rubber tube.
10. Determination of solar constant
11. Determination of emissive power of surface using spherical calorimeter.
12. Helmholtz resonator.
13. Velocity of sound through a wire using Sonometer.
14. Determination of velocity of sound using Kund’s tube.
15. Determination of frequency of an electrically maintained tuning fork
16. To verify the laws of transverse vibration using sonometer.
17. To verify the laws of transverse vibration using Melde’s apparatus.
18. To compare the mass per unit length of two strings using Melde’s apparatus.
19. Frequency of AC by using sonometer.

METHOD OF EVALUATION

Continuous Internal Assessment	End Semester examination	Total	Grade
40	60	100	

SEC – I PHYSICS OF EVERYDAY LIFE						I YEAR – SECOND SEMESTER		
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U23P2SE1	PHYSICS OF EVERYDAY LIFE	SEC I				2	2	75
To know where all physics principles have been put to use in daily life and appreciate the concepts with a better understanding also to know about Indian scientists who have made significant contributions to Physics								

UNIT-I MECHANICAL OBJECTS

Spring scales – bouncing balls –roller coasters – bicycles –rockets and space travel.

UNIT-II OPTICAL INSTRUMENTS AND LASER

Vision corrective lenses – polaroid glasses – UV protective glass – polaroid camera – colour photography – holography and laser.

UNIT-III PHYSICS OF HOME APPLIANCES

Bulb – fan – hair drier – television – air conditioners – microwave ovens – vacuum cleaners

UNIT-IV SOLAR ENERGY

Solar constant – General applications of solar energy – Solar water heaters – Solar Photo – voltaic cells – General applications of solar cells.

UNIT-V INDIAN PHYSICIST AND THEIR CONTRIBUTIONS

C.V.Raman, HomiJehangirBhabha, Vikram Sarabhai, Subrahmanyam Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology.

BOOKS FOR STUDY:

1. The Physics in our Daily Lives, Umme Ammara, Gugucool Publishing, Hyderabad, 2019.
2. For the love of physics, Walter Lawin, Free Press, New York, 2011.

METHOD OF EVALUATION

Continuous Internal Assessment	End Semester examination	Total	Grade
40	60	100	

EVS – ENVIRONMENTAL STUDIES			I YEAR - FIRST SEMESTER					
Subject Code	Subject Name	Category	L	T	P	Credits	Inst. Hours	Marks
U232ES	ENVIRONMENTAL STUDIES	EV S				2	2	75

UNIT:1 The Multidisciplinary nature of environmental studies

- ❖ Definition ,scope and importance
- ❖ Need for public awareness
- ❖ Natural resources
- ❖ Renewable and non- renewable resources
- ❖ Natural resources and associated problems

Unit –II Biodiversity and its conversation

- ❖ Introduction- definition, genetic , species and ecosystem diversity
- ❖ Biodiversity at global, national and local levels
- ❖ India as mega- diversity nation
- ❖ Hot – spots of biodiversity
- ❖ Conservation of Biodiversity. In-Situ and Ex-situ conservation of biodiversity

Unit- III Environmental problems

- ❖ Definition
- ❖ Causes , effects and control measures of
- ❖ Air pollution
- ❖ Water pollution
- ❖ Soil pollution
- ❖ Marine pollution
- ❖ Noise pollution
- ❖ Thermal pollution
- ❖ Nuclear hazard (Radioactive pollution)
- ❖ Solid waste management: causes effects and control measure of urban and industrial wastes.
- ❖ Role of an individual in prevention of pollution
- ❖ Pollution case studies
- ❖ Disaster management: floods earthquake, cyclone and landslides.

UNIT- IV

- ❖ From un sustainable to sustainable development
- ❖ Urban problems related to energy
- ❖ Water conservation rain water harvesting watershed management
- ❖ Resettlement and rehabilitation of people , its problems and concerns case studies
- ❖ Environmental ethics: issues and possible solution
- ❖ Climate change , global warming acid rain ozone layer depletion
- ❖ Nuclear accidents and holocaust, case studies.
- ❖ Wasteland reclamation
- ❖ Consumerism and waste products
- ❖ Environment protection act
- ❖ Air (prevention and control pollution)
- ❖ Water (prevention and control pollution)
- ❖ Wildlife protection Act
- ❖ Forest conservation Act
- ❖ Issues involved in enforcement of environmental legislation
- ❖ Public awareness.

UNIT-V Human population and environment

- ❖ Population growth, variations among nations
- ❖ Population explosion – family welfare programme
- ❖ Environment and human health
- ❖ Human rights
- ❖ HIV/ AIDS
- ❖ Women and child welfare
- ❖ Role of information technology in environmental human health
- ❖ Case studies.

EFFECTS OF FIRE WORKS

Man ,Environment and climate change – fire work celebrations- fire works and health hazards- types of fire- types and uses of fire extinguishers- fireworks and safety-creating awareness on reducing the usage of fire works.