



MANONMANIAM SUNDARANAR UNIVERSITY
- TIRUNELVELI
UG PROGRAMMES



OPEN AND DISTANCE LEARNING (ODL) PROGRAMMES

(FOR THOSE WHO JOINED THE PROGRAMMES FROM THE ACADEMIC YEAR 2023-2024 ONWARDS)

B.Sc. Physics

Semester	Course	Title of the Course	Course Code
IV	Part I –Languages (Tamil)	தமிழும் அறிவியலும்	J1TL41
	Part II – Languages (English)	General English - IV	J2EN41
	Core VII	Optics and Laser Physics	JMPH41
	Core VIII	Physics Practical – IV	JMPHP4
	Elective IV	Allied Chemistry – II	JECH41
		Allied Chemistry Practical - II	JECHP2
	Skill Enhancement Course - V	Maintenance of Electronic Appliances	JSPH41
	NMC /Substitute Paper	Instrumentation Physics – II	JNPH41
Value Education	Value Based Education (Common)	JVBE41	

தமிழும் அறிவியலும்

அலகு-1	தமிழரின் அறிவியல் சிந்தனைகள்
<ul style="list-style-type: none"> • அறிவியலும் மனித வாழ்வும் • ஐந்திணைப் பகுப்பும் சூழலியலும் • தொழில்நுட்ப மேலாண்மை • நீர் நில மேலாண்மை 	
அலகு-2	பழந்தமிழ் இலக்கியங்களில் அறிவியல் சிந்தனைகள்
<ol style="list-style-type: none"> 1. நிலவியல் 2. உலோகவியல் 	

<ol style="list-style-type: none"> 3. வானவியல் 4. உயிரியல் 5. உளவியல் 	
அலகு-3	இடைக்கால இலக்கியங்களில் அறிவியல் சிந்தனைகள்
<ol style="list-style-type: none"> 1. காப்பியங்களில் அறிவியல் 2. சிற்றிலக்கியங்களில் அறிவியல் 3. உரைநூல்களில் அறிவியல் 	
அலகு-4	இணையத் தமிழ்
<ol style="list-style-type: none"> 1. இணையத் தமிழ் பயன்பாடு - அறிமுகம் 2. இணையத்தமிழ்க் கல்விக்கழகம் 3. இணைய நூலகம் 4. செயற்கை நுண்ணறிவியல் 5. தமிழ்நாட்டு அறிவியல் ஆளுமைகள் 	
அலகு-5	கடிதம் எழுதுதலும் கட்டுரை எழுதுதலும்
<ul style="list-style-type: none"> • உறவு முறைக் கடிதப் பயிற்சி • அலுவலகக் கடிதப் பயிற்சி • விண்ணப்பப் படிவம் எழுதும் பயிற்சி • தன் விவரப் படிவம் எழுதும் பயிற்சி • கருத்து விளக்கக் கட்டுரைகள் எழுதும் பயிற்சி • பத்திரிகைகளுக்குக் கட்டுரை எழுதும் பயிற்சி 	
Text books	

Reference Books

1. தமிழர் வேளாண்மை மரபுகள் - இல).செ.கந்தசாமி
- 2. சங்க இலக்கியத்தில் வேளாண் சமுதாயம், பெ.மாதையன், நியூ செஞ்சரி புக் ஹவுஸ்
3. தமிழில் அறிவியல் இதழ்கள் சாமுவேல்- ரா.பார்வேந்தன் ஃபிஷ்கிறீன் பதிப்பகம், கோவை
4. அறிவியல் தமிழ் - பதிப்பாசிரியர் இராதா செல்லப்பன், பாரதிதாசன் பல்கலைக்கழகம், திருச்சிராப்பள்ளி.
5. இணையத் தமிழ் வரலாறு, மு.பொன்னவைக்கோ, பாரதிதாசன் பல்கலைக்கழகம்
6. இணையத் தமிழ், சந்திரிகா சுப்பிரமணியம் - சந்திரோதயம் பதிப்பகம்

7. இணையமும் இனிய தமிழும் - துரை. மணியரசன், இசை பதிப்பகம்
8. கணினித் தமிழ், இல. சுந்தரம் - விகடன் பிரசுரம்
9. மாண்புமிகு மண், பாமயன், வம்சி புக்ஸ்
10. தமிழ் இலக்கியத்தில் அறிவியல் சிந்தனைகள் வானதி பதிப்பகம், சென்னை

OPTICS and LASER PHYSICS

UNIT	Details
I	<p>LENS AND PRISMS: Lens: Lenses and its types – Equivalent focal length of two thin lenses in contact and separated by a distance – power of a lens. Aberrations: Spherical aberration, Methods of minimizing Spherical Aberration and chromatic aberrations. Prism: Dispersion by a prism, Angular dispersion and Dispersive power, Achromatic combination of prisms- Deviation without dispersion and Dispersion without deviation. Eyepieces: Eyepiece - Huygen's and Ramsden's eyepieces, construction and working – comparison</p>
II	<p>INTERFERENCE: Interference – Conditions – Theory of Interference - Fresnel's biprism – Experimental determination of the wavelength of light –Colours of thin films - Production of colours in thin films – Air wedge (Wedge-shaped film) – Newton's rings. Michelson's interferometer – Applications, (i) determination of the wavelength of a monochromatic source of light and (ii) determination of a thickness of a mica sheet.</p>
III	<p>DIFFRACTION: Fresnel and Fraunhofer diffraction-Fresnel's explanation of Rectilinear propagation of light - zone plate – action of zone plate for an incident spherical wave front–differences between a zone plate and a convex lens–diffraction pattern due to a straight edge –plane transmission diffraction grating– experiment to determine wavelengths.</p>
IV	<p>POLARISATION: Polarisation of light -double refraction – Nicol prism – Plane, circularly and elliptically polarized light –quarter wave plate–half wave plate – production and detection of circularly and elliptically polarized lights – Optical activity- Fresnel's explanation–Laurent half shade polarimeter– Experiment to determine specific rotator power.</p>
V	<p>LASERS: general principles of lasers – properties of lasers action – spontaneous and stimulate demission–population in version–optical pumping –He-Ne laser (principle and working) – CO₂ laser (principle and working)– Laser applications –holography and its applications.</p>
REFERENCE BOOKS	<ol style="list-style-type: none"> 1. Sathyaprakash, 1990, Optics, VII edition, Ratan Prakashan Mandhir, New Delhi. 2. Ajoy Ghatak, 2009, Optics, 4th Edition, PHI Pvt Ltd, New Delhi. 3. Jenkins A. Francis and White, 2011, Fundamentals of Optics, 4th edition, McGraw Hill Inc., New Delhi.

PHYSICS PRACTICAL - IV

UNIT	Details
I	<p>Minimum of Six Experiments from the list:</p> <ol style="list-style-type: none"> 1. Determination of refractive index of prism using spectrometer. 2. Determination of refractive index of liquid using hollow prism and spectrometer 3. Determination of dispersive power of a prism. 4. Determination of radius of curvature of lens by forming Newton's rings. 5. Determination of thickness of a wire using air wedge. 6. Determination of Cauchy's Constants. 7. Determination of resolving power of grating 8. Determination of refractive index of a given liquid by forming liquid lens 9. Determination of refractive index-by forming Newton's rings 10. Spectrometer-grating-oblique incidence-dispersive power 11. Tangent Galvanometer- Horizon talearth's magnetic in duction 12. Spectrometer-grating-oblique incidence-Wave length of Mercury spectral lines 13. Ballistic Galvanometer -Absolute capacity of a condenser 14. Ballistic Galvanometer-Comparison of Capacitances(C1/C2) 15. Determination of refractive index using Laser. <p><i>Note: Use of digital balance, digital screw gauge, digital calipers are permitted</i></p>

ALLIED CHEMISTRY - II

UNIT	Details
I	<p>Co-ordination Chemistry and Water Technology Course Outline Co-ordination Chemistry: Definition of terms-IUPAC Nomenclature Werner's theory EAN rule Pauling's theory- Postulates Applications to $[\text{Ni}(\text{CO})_4]$, $[\text{Ni}(\text{CN})_4]^{2-}$, $[\text{Co}(\text{CN})_6]^{3-}$ Chelation Biological role of Haemoglobin in and Chlorophyll (elementary idea) Applications in qualitative and quantitative analysis. Water Technology :Hardness of water, determination of hardness of water using EDTA method, zeolite method-Purification techniques- BOD, COD.</p>
II	<p>Carbo hydrates and Amino acids Carbohydrates: Classification, preparation and properties of glucose, fructose and sucrose. Discussion of open chain ring structures of glucose and fructose. Glucose- fructose inter conversion. Properties of starch and cellulose. Aminoacids: Classification preparation and properties of alanine, preparation of dipeptides using Bergmann method. RNA and DNA (elementary idea only).</p>
III	<p>Electrochemistry Galvanic cells Standard hydrogen electrode calomel electrode –standard electrode potentials -electrochemical series. Strong and weak electrolytes ionic product of water pH, pKa, pKb. Conductometric titrations- pH determination by colorimetric method - buffer solutions and its biological applications electroplating Nickel and chrome plating-Types of cells-fuel cells-corrosion and its prevention.</p>
IV	<p>Kinetics and Catalysis Order and molecularity. Integrated rate expression for I and II (2A Products) order reactions, Pseudo first order reaction, methods of determining order of a reaction Half-life period - Catalysis - homogeneous and heterogeneous, catalyst used in Contact and Haber's processes. Concept of energy of activation and Arrhenius equation.</p>
V	<p>Photochemistry Grothus Drapper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield Hydrogen -chloride reaction. Phosphorescence, fluorescence, chemiluminescence photosensitization and photosynthesis (definition with examples)</p>
Reference book	<p>1. P.L.Soni, Mohan Katyal, Text book of Inorganic chemistry; Sultan Chand and Company, New Delhi, twentieth edition, 2007. 2. R.Puri, L.R.Sharma, M.S.Pathania, Text book Physical Chemistry: Vishal Publishing Co., New Delhi, forty seventh edition, 2018. 3. B.K, Sharma Industrial Chemistry; GOEL publishing house, Meerut, sixteenth edition, 2014</p>

ALLIED CHEMISTRY PRACTICAL - II

Details

Semi-Micro Qualitative Analysis

1. Analysis of simple acid radicals: Carbonate, sulphide, sulphate, chloride, bromide, iodide, nitrate
2. Analysis of interfering acid radicals: Fluoride, oxalate, borate, phosphate.
3. Elimination of interfering acid radicals and Identifying the group of basic radicals
4. Analysis of basic radicals (group wise): Lead, copper, cadmium, nickel, cobalt, barium, ammonium.

Analysis of a simple salt containing one cation and one anion

Reference Books:

V.Venkateswaran, R.Veerawamy and A.R.Kulandivelu, Basic Principles of Practical Chemistry, Sultan Chand & Sons, NewDelhi, secondedition,1997.

MAINTANANCE OF ELECTRONICS APPLIANCES

UNIT	Details
I	SOLDERING TECHNIQUES Soldering tools- soldering iron- soldering station-dry solder joint, cold solder joints- Good and bad solders joints. Groove board, bread board and printed circuit board
II	POWER SUPPLY AND MEASURING INSTRUMENTS Transformer Zener Voltage regulators-Dual Power supply IC'S7805, 7905-switchmode power supply (SMP'S), principle of SMP'S-block diagram of SMP'S. Practical uses of Multimeter (analog and digital)- testing and measurements of resistor, capacitor and transistor
III	MAINTENANCE OF ELECTRONIC SHOME APPLIANCES LED/LCD TV-music player, CCTV Camera block diagram-its working - cathode ray oscilloscope-its principle and block diagram-Measurement of Frequency, AC and DC using CRO
IV	MAINTENANCE OF COMPUTER SYSTEMS Various parts of computer-its assembling-installing windows operating systems, software and antivirus computer hardware maintenance-formatting and maintenance-Basic Network installation-IP address setting and its maintenance. Modem-working principle.
V	SOLAR POWER SYSTEMS AND INVERTERS Solar Panels- Solar Inverter – their principle & operation, power rating-, Protection circuits used in inverters– Solar Battery- battery level, over load, over charging. Various faults and its rectification.
REFERENCE BOOKS	<ol style="list-style-type: none"> 1. BasicElectronics,6th edition by B Grob,Mc Graw Hill NY1 2. Integrate delectronics- Millman and Halkias 3. Electronic principles- Malvino6th edition 4. Operational amplifier–Gyakwar 5. Basic electronics B. Basavaraj, H.N.Shivasankar University press

INSTRUMENTATION PHYSICS – II

UNIT	Details
I	BASIC ELECTRONIC & DIGITAL INSTRUMENTS Electronic multi meters–Q meters–Vector meters–RF voltage and power measurements - Comparison of analog and digital techniques – digital voltmeter – digital multi meters
II	TRANSDUCERS Active trans ducers: Piezo electricity petrans ducers and Photovoltaic type transducer Passive transducer-Photoelectric type resistivetrans ducers- Inductive transducer.
III	MICRO SCOPE Optical and Electron micro scope-Comparison between optical and electron microscope – Resolving power - Magnification power - Types of electron microscope - TEM – SEM - Comparison between TEM and SEM.
IV	ADVANCES IN MEDICAL INSTRUMENTS X-ray machine-Comparison of Fluor os copy and Radiography-Lasers in medicine - Cryogenic surgery MRI (basics and instrumentation).
V	OSCILLO SCOPE Oscillo scope-Basic principle-CRT features–Block diagram of oscilloscope - Simple cathode ray oscilloscope.
REFERENCE BOOKS	1. David A.Bell, Electronic Instrumentation, and measurements, Prentice Hall of India Pvt Ltd, 2003 2. B.C.Nakra and K.K.Choudhry, Instrumentation, Measurement and Analysis, 2nd Edition, TMH, 2004

VALUE BASED EDUCATION

(Common Syllabus)

UNIT	Details
I	<p>Introduction to Value based Education</p> <p>a. Value: meaning and Classification b. Value based Education: Meaning, Characteristics, Components and Contents c. Value Erosion and Inculcation: Value crises in social life, economic life, and political life - Value inculcation: need and importance - Role of Parents and Teachers in inculcating values.</p>
II	<p>Harmony in Being and Living</p> <p>a. Harmony of the self (I) with the body: Nurturing of the body- Understanding myself as co-existence of the self and the body- Understanding needs of self and needs of the body- Understanding the activities in the self and activities in the body. b. Harmony in the Family, Society and Nature: Family as a basic unit of human interaction and values in relationships - Affection, care, guidance, reverence, Glory, gratitude, and love – Harmony in society: Justice preservation, Production Work, Exchange Storage Harmony in nature: four orders in nature- The holistic perception of harmony in existence.</p>
III	<p>Social Issues, Social Justice and Human Rights</p> <p>Social issues – causes and magnitude - alcoholism, drug addiction, poverty, Unemployment Social Justice: Definition and need – factors responsible for social injustice: caste and gender – contributions of social reformers. Human Rights: Concept and Principles of human rights – human rights and Indian constitution – Rights of Women and children – violence against women</p>
IV	<p>Values and Mass Media</p> <p>Mass media: Meaning, functions and characteristics – Effects and Influence on youth and children – Media Power – socio, cultural and political consequences of mass mediated culture - consumerist culture – Globalization – new media-prospects and challenges – Role of media in value building</p>
V	<p>Ethics</p> <p>Ethics: Meaning and importance Social ethics: tolerance, equity, justice for all, sensitivity towards mankind, love for nature and creatures, nationalism-love for nation, pride for nation, Honour to the law, Indian culture and traditions – Civic Sense: Being a good civilian Professional Ethics: Dedication to work and duty – Commitment to the Profession.</p>

<p style="text-align: center;">Reference</p>	<ol style="list-style-type: none"> 1. Allport, G.W., Vernon, P.E., and Lindzey, G. (1970) study of values, Buston: Houghton Mifflin. 2. Centaral Board of Secondary Education (1997), Value Education: A Handbook for Teachers, Delhi: Central Board of Secondary Education. 3. Delors, J. (1996), Learning: The Treasure within- Report of the International Commission on Education for the Twenty-First Century, Paris: UNESCO. 4. Morris, Charles W. (1956). Varieties of Human Values. Chikago: University of Chicago Press. 5. Shukla, R.P.(2005). Value Education and Human Rights. Sarup& Sons, New Delhi 6. Satchidananda. M.K. (1991), “Ethics, Education, Indian Unity And Culture” – Delhi, Ajantha Publications 7. Saraswathi. T.S. (Ed) 1999. Culture”, Socialisation And Human Development: Theory, Research And Application In India” – New Delhi Sage Publications. 8. Venkataiah. N (Ed) 1998, “Value Education” New Delhi Ph. Publishing Corporation. 9. Chakraborti, Mohit (1997) “Value Education: Changing Perspectives” New Delhi: Kanishka Publications. 10. Adithya Shetty and K.Pushpanandan Rao (2000): as quoted in Jayarami Reddy, B., (2010): “Values of B.Ed. teacher trainees in relation to certain psycho-sociological variables in Andhra Pradesh”, Unpublished Ph.D. Thesis, Department of Education, S.V.University, Tirupati, 11. Amareswaran, N. (2009): “Moral values of intermediate students”, Published Ph.D. Thesis, Department of Education, S.V. University, Tirupati. 12. Chetty, K. M. (2004): “Perspective of value oriented education” paper presented at UGC National Seminar on value oriented education, organized by Dept. of education, S.V.University, Tirupati. 13. Chhaganlal, Nandini Man Sukhbai (1992): “A study of the value, adjustment, attitude in the teaching profession and academic achievement of researchers’ children as compared to non-teachers children”. [Ph.D. Edu. Saurashtra University] 14. Mahatma Gandhi at Wardha Conference (1937) : as quoted in Gawande, E. N., (1994): “Value oriented education vision for better living”, Sarup and Sons Publishers 4740/23, Amsari Road, Darya Colony, New Delhi, p. 9. 15. Mohan Reddy (2011): “An analytical study of attitude of intermediate students towards value oriented education in relation to certain psycho-sociological variables”, Ph.D. theses, S.V.University, Tirupati. 16. Rajasekhar Reddy (2002) quoted in Nagarjuna, T.I. (2009): “A study of attitudes of DIET students towards value oriented education in relation to intelligence, personality and other variables”, Published Ph.D. Thesis, Department of Education, S.V. University, Tirupati. 17. Rajagopal (1989) quoted in Yella Reddy, B. (2009): “A study of moral judgment of intermediate students in relation to certain factors”, Published Ph.D. thesis, S.V.University, Tirupati. 18. Awasthi D. Value based Education is the only solution to the problem of Crisis of Moral Values among the youth of India. Retrieved from: worldwide, 2014. journals.com/gra/file:php? 2014. 1411110022_81.pdf. 19. Brubacher, J.S. Modern Philosophies of Education, McGraw Hill Book
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	<p>Company, INC, New York, 1950, Pp.93-95.</p> <p>20. Chetty, K.M., Value Education: A Conceptual Analysis, 70th Session of Indian Philosophical Congress, Haridwar, 1995, Pp.3-4.</p> <p>21. Dr. Jangaiah, C. Values Classification, APH Publishing Corporation, New Delhi, 1998, .</p> <p>22. Prahallada, N.N, Value Education in India. Association of Indian Universities, New Delhi, 2000.</p> <p>23. Rohidekar, S.R. Inculcation of values-how? APH Publishing Corporation, New Delhi, 1998.</p> <p>24. Seshadri, C. Education in Values, APH Publishing Corporation, New Delhi, 1998, Pp.47- 48.</p>
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