

17BPE101 - Principles of English Composition

Teaching Scheme					Exam Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	--	--	100

Unit I **Hours: 10**
 Overview of English, Writing Program Policies, Writing Tutors, Campus Resources and Internet Addresses

Unit II **Hours:09**
 Introduction to Academic Writing, Arguments, and Analysis

Unit III **Hours: 10**
 Reasoning, appropriacy of style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity, appreciating literary conventions

Unit IV **Hours:10**
 Narrative/ Expository prose models, prose comprehensions , sentence comprehensions

Total Hours: 39

Texts Books:

Ene, Estelle, Erik Ellis, and Meg Smith. A Student's Guide to First-Year Composition. 25thed. Plymouth, MI: Hayden-McNeil, 2004.

References books:

Hacker, Diana. Rules for Writers. 5thed. Boston: Bedford, 2004

17BPE102 - Mathematics I

Teaching Scheme					Exam Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	0	4	4	25	50	25	--	--	100

Unit I

Hours: 10

Systems of Linear Equations and Matrices: Matrix, Some Definitions Associated with Matrices Systems of Linear Equations, Matrices and Elementary Row Operations, The Inverse of a Square Matrix, Matrix Equations, Rank of the Matrix, Applications of Systems of Linear Equations.

Linear Transformation: Linear Transformations, Composition of Linear transformation The Null Space and Range, Isomorphisms, Inverse Linear Transformation, Matrix Representation of Linear Transformations, Similarity.

Eigen Value and Eigen Vectors: Eigen value and Eigen Vectors, Diagonalization, Cayley-Hamilton Theorem, Quadratic Form.

Unit II

Hours:10

Vector Spaces: Euclidean Vector Space, Vector Spaces, Subspaces, Linear Combination, Span, Linear Dependence and Independence, Basis, Finite Dimensional Vector Space, Basis and Dimension for Solution Space of the Homogeneous Systems, Reduction and Extension of Basis, Coordinate Vector Relative to Basis, Change of Basis, Row Space, Column Space and Null Space, Rank and Nullity

Unit III

Hours: 09

Inner Product Spaces: Introduction, The Dot Product on \mathbb{R}^n and Inner Product Spaces, Orthogonal Basis Orthonormal Bases, Gram-Schmidt Process, Orthogonal Complements, Application: Least Squares Approximation, Orthogonal Projection Diagonalization of Symmetric Matrices, Application: Quadratic Forms

Unit IV

Hours:10

Complex Analysis: Complex numbers, Exponential, Trigonometric, De Moivre's Theorem, Roots of a complex number Function of a Complex variable, Analytic function, Cauchy Riemann equations, Laplace Equation, Harmonic Functions, Harmonic Conjugate functions and their Engineering Applications Conformal mapping and its type, Some standard & special conformal mappings, Definition of a Complex line integral, Cauchy's integral theorem, Cauchy's Integral formula, Residue theorem, Calculation of residues, Evaluation of real definite integrals.

Total Hours: 39

Textbook For Calculus:

1. Higher Engineering Mathematics, by B. S Grewal, Khanna Publication, Delhi

Reference Books for Elements of Mechanical Engineering:

1. Higher Engineering Mathematics Vol. 1 by Dr. K.R.Kachot, Mahajan Publishing House
 2. Higher Engineering Mathematics Vol. 2 by Dr. K.R.Kachot, Mahajan Publishing House
 3. Complex Variables and Applications, by R. V. Churchill and J. W. Brown (7th Edition), McGraw-Hill.
 4. Complex Analysis, by J. M. Howie, Springer-Verlag (2004)
 5. Complex Variables-Introduction and Applications, by M. J. Ablowitz and A.S. Fokas, Cambridge University Press, 1998 (Indian Edition).
 6. Introduction to Linear Algebra with Application, by Jim Defranza, Daniel Gagliardi, Tata McGraw-Hill
 7. Elementary Linear Algebra, Applications version, by Anton and Rorres, Wiley India Edition.
 8. Advanced Engineering Mathematics, by Erwin Kreysig, Wiley Publication.
 9. Elementary Linear Algebra, by Ron Larson, Cengage Learning.
 10. Calculus, Volumes 2, by T. M. Apostol, Wiley Eastern.
 11. Linear Algebra and its Applications, by David C. Lay, Pearson Education
-

17BPE103 - Physics

Teaching Scheme					Exam Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

Unit I **Hours:7**

Vector concepts & applications in Physics: Introduction to vector algebra, Physical concepts in vector fields and Scalar fields with examples, Physical and mathematical concepts of gradient, divergence and curl, Green's theorem, Gauss theorem, applications in gravitation and electrostatics. Stokes' theorem and its applications.

Electrostatics and Electrodynamics: Gauss's law in dielectric medium, Equation of continuity, Biot Savart law – Ampere's law – magnetization and magnetic intensity, Faraday's law of induction – generalization of Ampere's law, displacement current, Maxwell's equations, wave equation for electromagnetic radiation, electromagnetic wave propagation in free space and isotropic dielectric medium, Poynting theorem & Poynting vector.

Unit II **Hours:7**

Waves and Oscillations: Types of waves, Simple harmonic motion, Damped simple harmonic motion, types of damping, Forced oscillation, resonance, , Energy Transport in Wave motion.

Acoustics & Ultrasonic: Introduction to Sound, Sabine's reverberation theory, Acoustical defects and their remedies, Doppler Effect. Ultrasonic waves, methods of their generation and detection, properties and application of ultrasonic waves.

Unit III **Hours:6**

Kinematics and Dynamics: Kinematics and dynamics of particles, work and energy system of particles, rotational kinematics and dynamics.

Optics: Interference: Types of interferences, Thin film interference, Anti-reflecting films; wedge shape films; Newton's rings and its applications,. Diffraction: Diffraction of light waves, Fraunhofer diffraction at a single slit, Two slit Fraunhofer Diffraction Pattern, N- Slit Fraunhofer Diffraction Pattern, diffraction grating, resolving power, Rayleigh Criterion, Fresnel diffraction (Introduction). Polarization: Polarization of light, production of polarized light, types of polarization and their representation, Malus's law, polarizer and analyser, Double refraction, Interference of Polarized light: Quarter wave plates and Half wave plates.

Unit IV **Hours:6**

Laser & Fibre Optics: Concepts of maser and laser, Interaction of radiation of matter-quantum mechanical view, Einstein coefficients spontaneous and stimulated emission, principles involves in laser, Meta stable state, Population inversion, three and four level laser system, and optical amplification and optical resonator, characteristics of laser, Ruby, He-Ne and semiconductor lasers, Application of lasers, Optical Fiber, physical structure and basic theory, modes in optical fibers, step index and graded index fibers, losses in optical fibers, applications of optical fibers in communication.

Total Hours: 26

Texts Books:

1. Resnick, Halliday and Krane, Physics part I and II, 5th Edition John Wiley (2002).
2. A. Ghatak, Optics, 3rd edition, Tata McGraw Hill (2005).

References books:

1. Kittel C., Knight W.O. and Ruderman M.A., Mechanics - Berkeley Physics Course, Vol. 1, Tata McGrawHill.
2. Purcell E.M. Electricity and Magnetism - Berkeley Physics Course, Vol.2, TataMcGraw-Hill.
3. Crawford F.S. - Waves and Oscillations, Berkeley Physics Course, Vol. 3,McGraw-Hill.
4. Feynman R.P., Leighton R.B. and Sands M. The Feynman Lectures on Physics, Vol. 1., Narosa Publication
5. Feynman R.P., Leighton R.B. and Sands M. The Feynman Lectures on Physics, Vol. 2. Narosa Publication
6. Griffith D.J.H., Introduction to Electrodynamics - Prentice Hall, India.
7. M. N. Avadhanulu, A text book of engineering Physics, S. Chand & Company, Ltd.
8. Brij Lal, N. Subrahmanyam, Heat and Thermodynamics, S. Chand & Company, Ltd.

17BPE104 - Geology for Petroleum Engineers

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25			100

Unit - I **Hours – 7**

The Earth

Introduction to origin, age, internal structure and constitution of earth; introduction to earth's lithosphere, atmosphere, hydrosphere, and biosphere; plate tectonic theory, tectonic elements of continents and oceans; continental drift; concept of isostasy.

Unit - II **Hours – 14**

Crystallography, Mineralogy and Petrology

Crystallography – unit cell, crystal systems, crystal faces, and crystal symmetry; concept of stereographic projection. Mineralogy – classification of minerals, physical and optical properties of rock forming minerals; classification and structure of silicates; brief descriptions of common silicates viz., olivine, pyroxene, amphibole, mica, feldspar and quartz; Concepts of solid solution and binary eutectic; Bowen's reaction series. Petrology – introduction; classification of rock types; formation, classification, texture and structure of igneous, metamorphic, and sedimentary rocks. Description of common Igneous Rocks viz., Rhyolite, Granite, Pegmatite, Basalt, Dolerite, and Gabbro; Sedimentary Rocks viz. Conglomerate, Breccia, Sandstone, Shale, and Limestone; Metamorphic Rocks viz., Slate, Schist, Gneiss, Quartzite, and Marble. Rock cycle; introduction to weathering of rocks with an emphasis on chemical weathering.

Unit –III **Hours – 8**

Structural Geology

Domain of Structural Geology; concepts of strike and dip; parameters controlling deformation of rocks; deformation in rocks – descriptions of folds, joints, faults and their classifications; unconformity; geological maps and sections; map symbols.

Unit – IV **Hours - 10**

Paleontology and Stratigraphy

Paleontology – definition of fossils and classification of organisms; evolution of life; nature of fossil records and processes of fossilization; uses of fossils; introduction to different fossil groups viz., microfossils, invertebrates, vertebrates, and plant fossils. Stratigraphy – Geological Time Scale; principles of stratigraphy; stratigraphic units; concept of stratigraphic columns; stratigraphic correlation. Physiographic divisions of India; Indian stratigraphy – Precambrian basement of Indian peninsula; stratigraphy of type sections viz., Vindhya, Gondwana, Jurassic, Cretaceous, and Tertiary.

Total Hours – 39

Texts and References:

1. Read H.H.: *Rutley's Elements of Mineralogy*; 2. Best M.G.: *Igneous and Metamorphic Petrology*, 3. Sengupta S.M. – *Introduction to Sedimentology*; 4. Hobbs B. E., Means W.D. & Williams P. F.: *An*

Outline of Structural Geology, 5. M.P. Billings: *Structural Geology*; 6. Kumar, Ravindra: Fundamentals of historical geology and stratigraphy of India; 7. Raup D.M. & Stanley S.M.: *Principles of Paleontology*; 8. Roy A.K.: Fossils in Earth Sciences; 9. Mukherjee P.K.: *A Text Book of Geology*, 10. G.B. Mahapatra: *A Text Book of Geology*, 11. Emiliani C.: *Planet Earth: Cosmology, Geology, and the Evolution of Life and Environment*.

17BPE105 - Energy and Environmental Studies

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	-	-	100

Unit – I **Hours- 7**

Global environmental studies, biodiversity, Human population and its impact on environment, Energy Resources Classification, Renewable and Non Renewable energy Resources; Tradable and Non tradable; Energy Outlook- Global versus India, Climate and cost of Energy.,

Unit – II **Hours- 7**

Study Of Various Energy Resources (Conventional Exploration & Production and Non-Conventional Exploration & Production of Fossil Fuels- Crude Oil, Natural Gas, Coal, Shale Gas, Gas Hydrates , CBM and CMM

Unit – III **Hours – 6**

Renewable and new Energy Resources, Hydro-Energy- Principle of Hydro power; Location advantage; construction of dams, Components of dams and equipment for generating electricity
Solar Energy- Solar Radiation and its measurement; Solar Energy Collectors; Solar Energy Storage
Wind Energy-Basic Principles; Power in the wind; Wind Energy Conversion System (WES) the Wind Mills; Electrical Generation System from wind Mills, Energy storage and transmission; Safety System; Environmental aspects,
Bio Energy- Energy from Biomass; Methods for obtaining energy from Biomass; thermal Gassification of biomass; Pyrolysis (Destructive distillation)

Unit – IV **Hours - 6**

Geothermal Energy- Geothermal Sources; Hydrothermal (Convective) Resources; Geo-pressure Resources; Hot- Dry Rock Resources; Energy from Oceans- Ocean Thermal Electric Conversion(OTEC); Energy from Tides(Tidal energy; Ocean Waves (Energy and Power from the waves; Wave energy conversion devices; Nuclear Energy-Nuclear fusion and Fission, Nuclear Fuels; Process of power generation from Nuclear plants ; Hydrogen Energy- Principle; Hydrogen generation process; Hydrogen Storage and Transportation.

Total Hours - 26

Texts and References:

1. GD Rai, Energy Resources.
2. United Nations Framework Classification for Fossil Energy and Mineral Resources
3. Twindle, J and Weir, A. D. (2006) Energy Resources, 2 nd Publication, Taylor and Francis Ltd.

17BPE106 - Engineering Drawing

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	4	2	4	-	-	-	50	50	100

Unit I

Introduction to Engineering Graphics, Drawing instruments and accessories, lettering, lines and dimensioning. BIS - SP46. Use of plane scales and Representative Fraction, Free hand sketching Engineering Curves: Classification of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutives and Spirals. Projections of Points & Lines: Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length of the line and its inclination with the reference planes.

Unit II

Projections of Solids & Section of Solids: Classification of solids. Projections of solids like Cylinder, Cone, Pyramid and Prism with its inclination to one reference plane and with two reference planes. Development of Lateral Surfaces: Concept of development of the different surfaces. Parallel Line Development and Radial Line Development.

Unit III

Orthographic Projections: Principle of projection, Principal planes of projection, Projections from the pictorial view of the object on the principal planes for View from Front, View from Top and View from Side using first angle projection method and third angle projection method, Full Sectional View.

Unit IV

Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.

Texts and References:

Texts and References

1. N.D.Bhatt and V.M.Panchal "Engineering Drawing", Charotar Publishing House, Anand
2. K. Venugopal, "Engineering Drawing & Graphics", New Age International (P) Ltd.
3. D.A.Jolhe, "Engineering Drawing with an Introduction to AutoCAD", Tata McGraw-Hill Publishing Co.Ltd., New Delhi

17BPE107 - Physics Practical

Teaching Scheme					Exam Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	2	1	2	-	-	-	50	50	100

List of Experiments

1. Study of Interference using Michelson's Interferometer.
2. Introduction to Oscilloscope.
3. Study of Interference using Newton's Ring experiment.
4. Experiment to determine volumetric coefficient of expansion of liquids.
5. Experiment to determine thermal conductivity of different solid bodies.
6. Experiment with solar collector.
7. Measurement of vapor pressure.
8. Experimental to determine linear thermal expansion coefficient of solid bodies.
9. Experiment on reflection of Ultrasonic waves.
10. Experiment to determine heat capacities.
11. Experiment to determine critical temperature.
12. Study of effect of electric force.
13. Experiments with hot air engine.
14. Experiments with heat pump.
15. Study of conducting electricity by means of electrolysis.
16. Measurement of viscosity.
17. Determining Plank's constant and Inverse square law.
18. Experiments on diffraction with He-Ne Laser Kit.
19. Study of Hall Effect.
20. Determining semiconductor energy band gap using four probe method.
21. Experiment to study forced oscillations.
22. Study of charging and discharging of capacitive plates.
23. Study of Bio-Savart's Law
24. Study of Kerr Effect.
25. Experiments on spectroscopy.
26. Experiments on Fiber Optics.
27. Study of Photoconductivity.
28. Study of Interference using ultrasonic Interferometer.
29. Determining e/m by Thomson's method.
30. Study of Polarization of light using LASER.
31. Millikan's oil drop experiment.
32. Study of Holography.

17BPE108 - Geology for Petroleum Engineers Practical

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	2	1	2	--	--	--	50	50	100
<ol style="list-style-type: none"> 1. Study of Crystal: Clinographic projection of cube 2. Study of common silicates in Hand Specimens: Quartz, Feldspar, Mica, Garnet, kyanite, Sillimanite 3. Study of Other Minerals in Hand Specimen: Graphite, Gypsum, Barite, Calcite, Aragonite, Corundum, haematite 4. Study of common Igneous Rocks in Hand Specimens: Granite, Basalt, Rhyolite, Syenite, Dolerite, Gabbro 5. Study of common Metamorphic Rock in Hand Specimen: Slate, Phyllite, Schist (Mica, Talc, Chlorite), Gneiss, Marble, Quartzite 6. Study of common Sedimentary Rock in Hand Specimen: Shale, Siltstone, Sandstone, Conglomerate, Breccia, Limestone 7. Study of Thin Sections of Minerals (quartz, feldspar, mica, pyroxene) & Rocks (Granite, Basalt, Gabbro, Schist, Shale, Sandstone, Limestone) 8. Study of Selected Fossils in Hand Specimen 9. Study of Topographic & Geological Maps 										

17BPE110 - Swami Vivekananda

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

Unit I

Hours: 07

Life of Young Naren

Early years – Young Naren and his friends, At the feet of Sri Ramakrishna, Training of the disciple, As a wandering monk, On the World Stage - Trip to America, The parliament of Religions, Vedanta in America, Experiences in the West, Triumphal Return to India – Calcutta and North India, The Himalayas, At Belur Math, Second visit to The West, To Europe, The Journey’s End – Last Days, The passing.

Unit II

Hours: 07

Insights – Karma, Raja, Jnana and Bhakti Yoga

Karma Yoga - Karma and its effect on character, The secret of work, Duty, Freedom. *Raja Yoga* – Prana, Control of Psychic Prana, Dharana, Dhyana and Samadhi. *Jnana Yoga* – Real Nature of man, Maya and Illusion, God in Everything, Realisation, Cosmology, Freedom of the soul. *Bhakti Yoga* – Need of Guru, Incarnate teachers and incarnations, Om: Word and Wisdom.

Unit III

Hours: 07

Swamiji’s Thoughts and Story

On The Ramayana and Mahabharata, Thoughts on the Gita, The story of Prahalada and Jada Bharata, The Great teachers of the World, On Lord Budhha, Christ, Indian Religious Thoughts, Art in India, The Claims of Religion, Concentration and Meditation, Spiritual Research.

Unit IV

Hours: 05

Modern, Rational and Universal Teachings

Divinity of man, Call to the youth of India, Self confidence, Faith-The source of strength, The power of will, The power of mind, Self motivation, Education, Religion, Love and purity, Give Up Superstition, True Effort, Be Brave, Service, Way to success, Leader and Organization, Secret of work.

Total Hours: 26

Texts and References:

1. Banhatti, G.S.; Life and Philosophy of Swami Vivekananda; New Delhi: Atlantic Publishers &Dist, 1995.
2. Desh Raj Sirswal; Value Education and Philosophy (A tribute issue to Swami Vivekananda); Milestone Education Review, 2014
3. Swami Vivekananda; Living at the Source: Yoga Teachings of Vivekananda; Shambhala Editions, 1993.

17BPE111 –Gandhian Thoughts

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	L	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100
<p>Unit I Hours: 05</p> <p>Life and Basic Works of Mahatma Gandhi, Sarvodaya.</p>										
<p>Unit II Hours: 07</p> <p>Truth and Non – Violence, Gandhian Approach to Science, Technology and Development</p>										
<p>Unit III Hours: 07</p> <p>The Constructive work and Human Liberation, Satyagraha and Peace Making</p>										
<p>Unit IV Hours: 07</p> <p>Gandhian way of Management and Trusteeship, Gandhian Futurology, Gandhian Life Style, Contemporaries of Mahatma Gandhi.</p>										
Total Hours : 26										
<p>Text and Reference Books</p> <ol style="list-style-type: none"> 1. Gandhi, M. K. My experiments with truth 2. Hingorani, A. T and Hingorani, G. A. (1985) The Encyclopaedia of Gandhian Thoughts 3. Gupta, A. A. Gandhian Thoughts 										