

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NPH532	Semester: ODD	Semester: V Session 2018 -2019 Month: July-Dec
Course Name	Materials Science		
Credits	4	Contact Hours	4

Faculty (Names)	Coordinator(s)	Dr. Manoj Kumar and Dr. Sandeep Chhoker
	Teacher(s) (Alphabetically)	Dr. Manoj Kumar and Dr. Sandeep Chhoker

COURSE OUTCOMES		COGNITIVE LEVELS
C301-11.1	Recall variety of engineering materials for their applications in contemporary devices	Remembering (C1)
C301-11.2	Explain dielectric, optical, magnetic, superconducting, polymer and thermoelectric properties	Understanding (C2)
C301-11.3	Apply properties of dielectric, optical, magnetic, superconducting, polymer and thermoelectric materials to solve related problems	Applying (C3)
C301-11.5	Prove and estimate solution of numerical problems using physical and mathematical concepts involved with various materials	Evaluating (C5)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Dielectric Materials	Polarization mechanism & Dielectric Constant, Behavior of polarization under impulse and frequency switching, Dielectric loss, Spontaneous polarization, Ferroelectrics, Piezoelectric effect; Applications of Dielectric Materials	10
2.	Magnetic Materials	Concept of magnetism, Classification – dia-, para-, ferro-, antiferro- and ferri-magnetic materials, Their properties and Applications; Hysteresis; Magnetic Storage and Surfaces.	10
3.	Super conducting Materials	Meissner effect, Critical field, type-I and type-II superconductors; Field penetration and London equation; BCS Theory, High temperature Superconductors and their Applications	5
4.	Polymers and Ceramics	Various types of Polymers and their applications; Mechanical behavior of Polymers, synthesis of polymers; Structure, Types, Properties and Applications of Ceramics; Mechanical behavior	6

		and Processing of Ceramics.	
5.	Optical Materials	Basic Concepts, Light interactions with solids, Optical properties of nonmetals: refraction, reflection, absorption, Beer-Lambert law, transmission, Photoconductivity. Drude Model, relation between refractive index and relative dielectric constant, Optical absorption in metals, insulators and semiconductors. Introduction to Photonic band gap (PBG) materials and its applications	6
6.	Thermoelectric Materials	Thermoelectric (TE) effects and coefficients (Seebeck, Peltier, Thompson); TE materials and devices, Heat conduction, Cooling, Figure of Merit; TE power generation (efficiency), refrigeration (COP), Examples and applications.	3
		Total number of Lectures	40

Evaluation Criteria

Components

Maximum Marks

T1	20
T2	20
End Semester Examination	35
TA	25 [2 Quiz (10), Attend. (10) and Class performance (5)]
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	S.O. Pillai, Solid State Physics, New Age International Publishers.
2.	B. B. Laud, Laser and Non-linear Optics, John Wiley & Sons
3.	Van Vlack, Elements of Material Science and Engineering, Pearson Education.
4.	Srivastava and Srinivasan, Material Science and Engineering,
5.	W.D. Callister Jr., Material Science and Engineering: An Introduction, John Wiley.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NPH531	Semester : Odd	Semester V Session 2019 -2020 Month from : July to Dec
Course Name	Quantum Mechanics for Engineers		
Credits	04	Contact Hours	04

Faculty (Names)	Coordinator(s)	Dr. Vikas Malik and Dr. Swati Rawal
	Teacher(s) (Alphabetically)	Dr. Vikas Malik and Dr. Swati Rawal

COURSE OUTCOMES		COGNITIVE LEVELS
C301-10.1	Remember basics of Quantum Mechanics and its applications.	Remembering (C1)
C301-10.2	Explain postulates of quantum mechanics, Dirac notation, Schrödinger Equation, Perturbation theory and Qubits.	Understanding (C2)
C301-10.3	Solve various problems related to different quantum systems and construct quantum circuits using quantum gates.	Applying (C3)
C301-10.4	Analyse the results obtained for various physical systems and to establish the advantages of some simple protocols of quantum information processing.	Analyzing (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction	Wave particle duality, quantum physics (Planck and Einstein's ideas of quantized light), postulates of quantum mechanics, time dependent and time independent Schrodinger equation, operators, probability theory, expectation values, and uncertainty principle and its implications, no cloning applications	8
2.	Measurement Theory with Applications	Matrix and linear algebra, Eigen values and eigenfunctions Hilbert space, Kets, Bras and Operators, Bras Kets and Matrix representations, Measurements, Stern Gerlach Experiment, Observables and Uncertainty Relations, No-cloning theorem, Pauli Spin Matrices.	10
3.	Potential problems	1-D, 2-D, and 3-D potential problems (including infinite and finite square well). Tunneling, harmonic oscillator, separation in spherical polar coordinates, hydrogen atom, etc.),	08

4.	Approximation methods	Time independent perturbation theory for nondegenerate and degenerate energy levels.	4
5.	Advanced Applications	Kronig Penny model, Basic ideas of quantum computing, Qubit, Gate model of quantum computing : H, CNOT, Pauli Gates, BB84 protocol, Advantages of quantum computing, Quantum wire, Quantum dot and realization of CNOT using Quantum dot.	10
Total number of Lectures			40
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 [2 Quiz (10 M), Attendance (10 M) and Cass performance (5 M)]	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	The new quantum universe by Toney Hey and Patrick Walters, Cambridge University Press.
2.	Quantum mechanics a new introduction by Kenichi Konishi and G Paffuti, OUP., 2009
3.	Quantum physics by Eyvind H Wichman (Berley Physics course Vol 4) Tata McGraw Hill 2008
4.	Elements of quantum computation and quantum communication by A Pathak, CRC Press 2013.
5.	Introduction to Quantum Mechanics by David J. Griffiths, Second Edition, Pearson, 2015.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NPH533	Semester Odd	Semester V Session 2018 -2019 Month from July to December
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Course Name	Laser Technology and Applications		
Credits	4	Contact Hours	4

Faculty (Names)	Coordinator(s)	Navneet Kumar Sharma and Amit Verma
	Teacher(s) (Alphabetically)	Navneet Kumar Sharma and Amit Verma

COURSE OUTCOMES		COGNITIVE LEVELS
C301-12.1	Define the coherent properties, high brightness of laser, population inversion and optical feedback to laser technology	Remember Level (C1)
C301-12.2	Extend the knowledge of lasers in some applications like LIDAR, laser tracking, bar code scanner, lasers in medicine and lasers in industry	Understand Level (C2)
C301-12.3	Apply the optical ray transfer matrix to determine the stability of a laser resonator	Apply Level (C3)
C301-12.4	Distinguish the operational principles of CW, Q-switched, mode locked lasers; laser rate equations for three & four level lasers; different types of laser systems	Analyze Level (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Fundamentals of Lasers	Laser idea and properties; Monochromaticity, directionality, brightness, Temporal and spatial Coherence. Interaction of radiation with matter; Absorption, spontaneous and stimulated emission of radiation, Rates equations, Einstein's A and B coefficients. Laser rate equations: Four level and three level systems. Conditions for producing laser action, population inversion, saturation intensity, threshold condition and gain optimization. Experimental techniques to characterize laser beam.	12
2.	Types of Lasers	Pumping processes; optical and electrical pumping. Optical Resonators; The quality factor, transverse and longitudinal mode selection; Q switching and Mode locking in lasers. Confocal, planar and spherical resonator systems. Types of Lasers; Solid state Lasers; Ruby Laser, Nd:YAG laser. Gas lasers; He-Ne laser, Argon laser, CO ₂ , N ₂ and Excimer Laser. Dye (liquid) Laser, Chemical laser (HF), Semiconductor Lasers; Heterostructure Lasers, Quantum	16

		well Lasers. Free electron laser, X-ray laser and Ultrafast Laser.	
3.	Applications of Lasers	Image processing; Spatial frequency filtering and Holography, Laser induced fusion; Fusion reactor, creation of Plasma. Lightwave communications. Use in optical reader (CD player) and writer. Nonlinear optics; harmonic generation, self focusing. Lasers in industry; Material processing, Cutting, welding and hole drilling. Precision length measurement, velocity measurement, Laser Tracking, Metrology and LIDAR. Lasers in medicines and surgery. Lasers in defense, Lasers in space sciences, Lasers in sensors.	12
Total number of Lectures			40
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 [2 Quiz (10 M), Attendance (10 M) and Cass performance (5 M)]	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Thyagarajan and Ghatak, <i>Lasers Theory and Applications</i> , Macmilan India.
2.	W. T. Silfvast, <i>Laser Fundamentals</i> , Cambridge Univ-Press.
3.	O. Svelto, <i>Principles of Lasers</i> , Springer.
4.	Saleh and Teich, <i>Fundamentals of Photonics</i> , John Wiley & Sons.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NPH535	Semester Odd	Semester V Session 2019 -2020 Month from: July-Dec
Course Name	NUCLEAR SCIENCE AND ENGINEERING		

Credits	4	Contact Hours	4
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Faculty (Names)	Coordinator(s)	Dr. Vivek Sajal
	Teacher(s) (Alphabetically)	Dr. Vivek Sajal

COURSE OUTCOMES		COGNITIVE LEVELS
C301-14.1	Relate terminology and concepts of nuclear science with various natural phenomenon and engineering applications.	Remembering (C1)
C301-14.1	Explain various nuclear phenomenon, nuclear models, mass spectrometers, nuclear detectors, particle accelerators. and classify elementary particles.	Understanding (C2)
C301-14.1	Solve mathematical problems for various nuclear phenomenon and nuclear devices.	Applying (C3)
C301-14.1	Analyze the results obtained for various physical problems and draw inferences from the results.	Analyzing (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Nuclear Constituents and their properties, Nuclear Forces	Rutherford scattering and estimation of nuclear size, Constituents of the nucleus and their properties, Nuclear Spin, Moments and statistics, Magnetic dipole moment, Electric quadruple moment. Nuclear forces, Two body problem - Ground state of deuteron, Central and non-central forces, Exchange forces: Meson theory, Yukawa potential, Nucleon-nucleon scattering, Low energy n-p scattering, Effective range theory, Spin dependence, charge independence and charge symmetry of nuclear forces, Isospin formalism.	07
2.	Nuclear Models	Binding energies of nuclei, Liquid drop model: Semi-empirical mass formula, Mass parabolas, Prediction of Nuclear stability, Bohr-Wheeler theory of fission, Shell model, Spin-orbit coupling. Magic numbers, Angular momenta and parities of nuclear ground state, Magnetic moments and Schmidt lines, Collective model of a nucleus.	05
3.	Nuclear decay and Nuclear reactions	Alpha decay, Beta decay, Pauli's Neutrino hypothesis- Helicity of neutrino, Theory of electron capture, Non-conservation of parity, Fermi's theory, Gamma decay: Internal conversion, Multipole transitions in nuclei, Nuclear isomerism, Artificial radioactivity, Nuclear reactions and conservation laws, Q-value equation, Centre of mass frame in nuclear Physics, Scattering and reaction cross sections,	08

		compound nucleus, Breit-Wigner one level formula	
4.	Interaction of nuclear radiation with matter	Interaction of charge particles with matters: Bohr's ionization loss formula and estimation of charge, mass and energy. Interaction of electromagnetic radiation with matter, Linear absorption coefficient. Nuclear particle detectors and neutron counters.	07
5.	Accelerator and reactor Physics	Different types of reactors, tracer techniques, activation analysis. Radiation induced effects and their applications: Accelerators: Linear accelerators, Van de Graff generator, LINAC, Cyclotrons, Synchrotrons, Colliders.	06
6.	Cosmic radiation and Elementary Particles	Cosmic radiation: Discovery of cosmic radiation, its sources and composition, Latitude effect, altitude effect and east-west asymmetry, secondary cosmic rays, cosmic ray shower, variation of cosmic intensity and Van Allen radiation belt. Elementary particles: Classification of particles, K-mesons, Hyperons, particles and antiparticles, fundamental interactions, conservation laws, CPT theorem, resonance particles and hypernucleus, Quark model.	07
Total number of Lectures			40

Evaluation Criteria

Components

Maximum Marks

T1	20
T2	20
End Semester Examination	35
TA	25 [2 Quiz (10 M), Attendance (10 M) and Cass performance (5 M)]
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	K.S. Krane, 1987, Introductory Nuclear Physics, Wiley, New York.
2.	I. Kaplan, 1989, Nuclear Physics, 2nd Edition, Narosa, New Delhi.
3.	B.L. Cohen, 1971, Concepts of Nuclear Physics, TMH, New Delhi.
4.	R.R. Roy and B.P. Nigam, 1983, Nuclear Physics, New Age International, New Delhi.
5.	H.A. Enge, 1975, Introduction to Nuclear Physics, Addison Wesle, London.
6.	Y.R. Waghmare, 1981, Introductory Nuclear Physics, Oxford-IBH, New Delhi.
7.	R.D. Evans, 1955, Atomic Nucleus, McGraw-Hill, New York.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NMA731	Semester Odd (specify Odd/Even)	Semester V Session 2018 -2019 Month from July to December
Course Name	Theory of Numbers		
Credits	4	Contact Hours	3-1-0
Faculty (Names)	Coordinator(s)	Dr. Himanshu Agarwal	
	Teacher(s) (Alphabetically)	Dr. Himanshu Agarwal	
COURSE OUTCOMES			COGNITIVE LEVELS
C301-4.1	explain Euclid algorithm, linear Diophantine equations and prime numbers.		Explain Level (C2)

C301-4.2	solve system of linear congruences using properties of congruences.	Solve Level(C3)
C301-4.3	explain numbers of special form and number theoretic functions.	Explain Level (C2)
C301-4.4	apply the concepts of order, primitive roots and indices to solve congruences.	Apply Level (C3)
C301-4.5	apply Legendre symbol and quadratic reciprocity theorem to solve quadratic congruences.	Apply Level (C3)
C301-4.6	apply and analyse the concepts of number theory in hashing, cryptography, calendar and ISBN check digits problems.	Analyse Level (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Divisibility and Primes	Division algorithm, Greatest common divisor, Euclid's algorithm, gcd as a linear combination of coprime integers, Linear Diophantine equations, primes, The fundamental theorem of arithmetic, The Sieve of Eratosthenes, Canonical prime factorization, Least common multiple, Prime number theorem(statement only), Goldbach and twin primes conjectures.	8
2.	Theory of Congruences	Definitions and basic properties, Residue classes, complete residue systems, reduced residue systems, Linear congruences in one variable, Simultaneous linear congruences, Chinese remainder theorem and its applications, Linear congruences in more than one variable, Fermat's theorem, Pseudoprimes and Carmichael numbers, Wilson's Theorem	8
3.	Number Theoretic Functions and Numbers of Special Form:	Greatest integer function, The number-of-divisors function, The sum-of-divisors function, Multiplicative function, The Mobius function, Mobius inversion formula, The Euler's totient function, Euler's theorem, Perfect numbers, characterization of even perfect numbers, Mersenne primes, Fermat primes	7
4.	Primitive Roots and Indices	The order of an integer, Primitive roots, Theory of indicies, Solution of non-linear congruences.	7
5.	Quadratic Residues	Quadratic residues and non-residues, Euler's Criterion, The Legendre symbol, Gauss Lemma, Quadratic reciprocity, Solution of quadratic congruences.	6
6.	Applications	Hashing functions, Cryptosystem, Calendar problem, ISBN check digits	6

Total number of Lectures	42
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Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials)
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1. James Strayer, Elementary Number Theory, Waveland Press,,2001

2.	Kenneth Rosen , <i>Elementary Number Theory and its Applications</i> , 5th Edition, 2005
3.	I. Niven, H. Zuckerman, H. Montgomery , <i>An Introduction to the Theory of Numbers</i> , 5th Edition, Wiley, 2013.
4.	David M. Burton , <i>Elementary Number Theory</i> , 7 th Edition, McGraw Hill Education (India) Private Limited, 2006

Detailed Syllabus

Lecture-wise Breakup

Course Code	16BINMA533	Semester - Odd (specify Odd/Even)	Semester V Session 2018 -2019 Month from July 2018 - Dec 2018
Course Name	Matrix Computations		
Credits	4	Contact Hours	3-1-0
Faculty (Names)	Coordinator(s)	Dr. Pato Kumari and Dr. Amita Bhagat	

	Teacher(s) (Alphabetically)	Dr. Amita Bhagat Dr. Pato Kumari	
COURSE OUTCOMES			COGNITIVE LEVELS
After pursuing the above mentioned course, the students will be able to:			
C301-3.1	explain the basics of matrix algebra and inverse of a matrix by partitioning.	Understanding level (C2)	
C301-3.2	solve the system of linear equations using direct and iterative methods.	Applying Level (C3)	
C301-3.3	explain the vector spaces and their dimensions, norm of a vector and matrix.	Understanding level (C2)	
C301-3.4	apply the concepts of inner product space to construct Q-R decomposition and orthonormal basis using Gram-Schmidt process.	Applying Level (C3)	
C301-3.5	construct Gershgorin's circles and solve eigenvalue problems including power and inverse power methods.	Applying Level (C3)	
C301-3.6	analyze systems of differential and difference equations arising in dynamical systems using matrix calculus.	Analyzing Level (C4)	
Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Matrix Algebra	Basics of matrices, Submatrices, rank of a matrix, Normal Form, Inverse of a matrix by Gauss Jordan Method, Inverse of a matrix by partitioning method and by elementary matrices	6
2.	Linear System of equations	Existence and uniqueness of solution for system of linear equations, Gauss elimination method, Pivoting strategies, Gauss Jacobi and Gauss Siedel method, LU decomposition, Crout's and Doolittle's method	9
3.	Vector and Inner Product Spaces	Vector spaces, Subspaces, Linearly independent and dependent set of vectors, dimension and basis of vector space, Norms of vectors and matrix, Inner product space, orthogonal and orthonormal sets, Projections, Gram-Schmidt process, Q-R decomposition	10
4.	Eigen value Problems	Eigen values and Eigenvectors, Greshgorin's circle, Power and Inverse power methods, Similar, modal and diagonalizable matrices, Quadratic, positive definite	9

		and Canonical forms	
5.	Matrix Calculus	Powers and functions of matrices, Application to solve discrete dynamical systems, solution of initial value problems	8
Total number of Lectures			42
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 (Quiz, Assignments, and Tutorials)	
Total		100	
Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)			
1.	Bronson, R. , Matrix Methods an Introduction, Academic Press, 1991.		
2.	Golub, G. H. , Matrix Computations, Johns Hopkins University Press, 1996.		
3.	Datta, K. B. , Matrix and Linear Algebra, Prentice Hall of India, 1990.		
4.	David, W. Lewis. , Matrix Theory, World Scientific, 1991.		

Course Code	16B1NMA731	Semester Odd (specify Odd/Even)	Semester V Session 2018 -2019 Month from July to December
Course Name	Theory of Numbers		
Credits	4	Contact Hours	3-1-0
Faculty (Names)	Coordinator(s)	Dr. Himanshu Agarwal	
	Teacher(s) (Alphabetically)	Dr. Himanshu Agarwals	
COURSE OUTCOMES			COGNITIVE LEVELS
C301-4.1	explain Euclid algorithm, linear Diophantine equations and prime numbers.		Explain Level (C2)
C301-4.2	solve system of linear congruences using properties of congruences.		Solve Level(C3)
C301-4.3	explain numbers of special form and number theoretic functions.		Explain Level (C2)
C301-4.4	apply the concepts of order, primitive roots and indices to solve congruences.		Apply Level (C3)
C301-4.5	apply Legendre symbol and quadratic reciprocity theorem to solve quadratic congruences.		Apply Level (C3)

C301-4.6	apply and analyse the concepts of number theory in hashing, cryptography, calendar and ISBN check digits problems.	Analyse Level (C4)	
Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Divisibility and Primes	Division algorithm, Greatest common divisor, Euclid's algorithm, gcd as a linear combination of coprime integers, Linear Diophantine equations, primes, The fundamental theorem of arithmetic, The Sieve of Eratosthenes, Canonical prime factorization, Least common multiple, Prime number theorem(statement only), Goldbach and twin primes conjectures.	8
2.	Theory of Congruences	Definitions and basic properties, Residue classes, complete residue systems, reduced residue systems, Linear congruences in one variable, Simultaneous linear congruences, Chinese remainder theorem and its applications, Linear congruences in more than one variable, Fermat's theorem, Pseudoprimes and Carmichael numbers, Wilson's Theorem	8
3.	Number Theoretic Functions and Numbers of Special Form:	Greatest integer function, The number-of-divisors function, The sum-of-divisors function, Multiplicative function, The Mobius function, Mobius inversion formula, The Euler's totient function, Euler's theorem, Perfect numbers, characterization of even perfect numbers, Mersenne primes, Fermat primes	7
4.	Primitive Roots and Indices	The order of an integer, Primitive roots, Theory of indicies, Solution of non-linear congruences.	7
5.	Quadratic Residues	Quadratic residues and non-residues, Euler's Criterion, The Legendre symbol, Gauss Lemma, Quadratic reciprocity, Solution of quadratic congruences.	6
6.	Applications	Hashing functions, Cryptosystem, Calendar problem, ISBN check digits	6
Total number of Lectures			42
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 (Quiz, Assignments, Tutorials)	
Total		100	
Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)			
1.	James Strayer , <i>Elementary Number Theory</i> , Waveland Press,,2001		
2.	Kenneth Rosen , <i>Elementary Number Theory and its Applications</i> , 5th Edition, 2005		
3.	I. Niven, H. Zuckerman, H. Montgomery , <i>An Introduction to the Theory of Numbers</i> , 5th Edition, Wiley, 2013.		
4.	David M. Burton , <i>Elementary Number Theory</i> , 7 th Edition, McGraw Hill Education (India) Private Limited, 2006		

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Lecture-wise Breakup

Course Code	17B1NMA531	Semester - Odd	Semester V Session 2018 -2019
			Month from July 2018 - Dec 2018
Course Name	Basic Numerical Methods		
Credits	4	Contact Hours	3-1-0
Faculty (Names)	Coordinator(s)	Dr. Yogesh Gupta	
	Teacher(s) (Alphabetically)	Dr. Puneet Rana Dr. Yogesh Gupta	
COURSE OUTCOMES			COGNITIVE LEVELS
After pursuing the above mentioned course, the students will be able to:			
C301-5.1	explain the concepts of approximation and errors in computation.		Understanding level (C2)
C301-5.2	construct numerical methods for algebraic and transcendental equations		Applying

	and their convergence.	Level (C3)	
C301-5.3	outline the methods of interpolation using finite differences and divided difference formulas.	Understanding level (C2)	
C301-5.4	make use of numerical differentiation and integration.	Applying Level (C3)	
C301-5.5	solve the system of linear equations using direct and iterative methods.	Applying Level (C3)	
C301-5.6	solve ordinary differential equations using different numerical methods.	Applying Level (C3)	
Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Approximation and Errors in Computation	Errors, relative error, absolute error, order of approximation.	02
2.	Algebraic and Transcendental Equations	Bisection Method, Regula- Falsi Method, Secant Method, Iterative method, Newton-Raphson Method, , convergence, Horner's method	07
3.	Interpolation	Finite Differences, Relation between difference operators, Newton's Forward and Backward Interpolation, Gauss Backward Interpolation, Bessel's and Sterling's central difference operators, Laplace-Everett's formula, Newton's divided difference formula	08
4.	Numerical Differentiation and Integration	Derivatives using Newton's Forward and Backward Interpolation, Bessel's and Sterling's central difference operators, Maxima and minima of a tabulated function. Boole's and Weddle's rule, Romberg's method, Euler-Maclaurin formula, Gaussian Integration.	11
5.	System of Equations	Gauss Elimination method, Given's method, Gauss-Seidel Method, House holder's method.	05
6.	Numerical Solution of Ordinary Differential Equations	Picard's method, Euler's method, Modified Euler's method, Fourth order Runge-Kutta method, Milne's method for fixed order, second order and simultaneous differential equations, Finite-Difference Method	09
Total number of Lectures			42
Evaluation Criteria			
Components		Maximum Marks	
T1		20	

T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, and Tutorials)
Total	100
Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	C. F. Gerald and P. O. Wheatley , Applied Numerical Analysis, 6 th Ed., Pearson Education, 1999.
2.	M.K. Jain, S.R.K. Iyengar and R. K. Jain , Numerical Methods for Scientific and Engineering Computation 6 th Ed., New Age International, New Delhi, 2014.
3.	R.S. Gupta , Elements of Numerical Analysis by 1st Ed., (2009) Macmillan.
4.	S.D. Conte and C. deBoor , Elementary Numerical Analysis, An Algorithmic Approach, 3 rd Ed., McGraw-Hill, New York, 1980.

Detailed Syllabus

Lecture-wise Breakup

Course Code	15B1NHS434	Semester: Odd	Semester V Session 2018 -2019 Month from July 2018 to December 2018
Course Name	PRINCIPLES OF MANAGEMENT		
Credits	3	Contact Hours	2-1-0

Faculty (Names)	Coordinator(s)	Dr. Shirin Alavi (Sector 62) and Dr. Ruchi Gautam (Sector 128)
	Teacher(s) (Alphabetically)	Dr. Praveen Sharma , Dr. Ruchi Gautam and Dr. Shirin Alavi

COURSE OUTCOMES		COGNITIVE LEVELS
C303-1.1	Describe the functions, roles and skills of managers and illustrate how the manager's job is evolving.	Understanding Level (C2)
C303-1.2	Examine the relevance of the political, legal, ethical, economic and	Analyzing Level (C4)

	cultural environments in global business.	
C303-1.3	Evaluate approaches to goal setting, planning and organizing in a variety of circumstances.	Evaluating Level (C5)
C303-1.4	Evaluate contemporary approaches for staffing and leading in an organization.	Evaluating Level (C5)
C303-1.5	Analyze contemporary issues in controlling for measuring organizational performance.	Analyzing Level (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction to Managers and Management	Management an Overview: Introduction, Definition of Management, Role of Management, Functions of Managers, Levels of Management, Management Skills and Organizational Hierarchy, Social and Ethical Responsibilities of Management: Arguments for and against Social Responsibilities of Business, Social Stakeholders, Measuring Social Responsiveness and Managerial Ethics, Omnipotent and Symbolic View, Characteristics and importance of organizational culture, Relevance of political, legal, economic and Cultural environments to global business, Structures and techniques organizations use as they go international .	7
2.	Planning	Nature & Purpose, Steps involved in Planning, Objectives, Setting Objectives, Process of Managing by Objectives, Strategies, Policies & Planning Premises, Competitor Intelligence, Benchmarking, Forecasting, Decision-Making.	5
3.	Organizing	Nature and Purpose, Formal and Informal Organization, Organization Chart, Structure and Process, Departmentalization by difference strategies, Line and Staff authority- Benefits and Limitations-De-Centralization and Delegation of Authority Versus, Staffing, Managerial Effectiveness.	7
4.	Directing	Scope, Human Factors, Creativity and Innovation, Harmonizing Objectives, Leadership, Types of Leadership Motivation, Hierarchy of Needs, Motivation theories, Motivational Techniques, Job Enrichment, Communication, Process of Communication, Barriers and Breakdown, Effective Communication, Electronic media in Communication.	4

5.	Controlling	System and process of Controlling, Requirements for effective control, The Budget as Control Technique, Information Technology in Controlling, Productivity, Problems and Management, Control of Overall Performance, Direct and Preventive Control, Reporting, The Global Environment, Globalization and Liberalization, International Management and Global theory of Management.	5
Total number of Lectures			28

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Project: Report & Viva)
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Robbins, S.P. & Coulter, Mary, Management, 14 th ed., Pearson , 2009
2.	Robbins, S.P. & Decenzo, David A., Fundamentals of Management, 7 th ed., Pearson, 2010
3.	Principles of Management Text and Cases, Pravin Durai, Pearson ,2015

Detailed Syllabus

Lecture-wise Breakup

Subject Code	18B12HS311	Semester ODD	Semester 5 Session 2018-19 Month from July 2018 to December 2018
Subject Name	STRATEGIC HUMAN RESOURCE MANAGEMENT		
Credits	3	Contact Hours	2-1-0
Faculty (Names)	Coordinator(s)	Praveen Sharma (Sec-128), Santoshi Sengupta (Sec-62)	
	Teacher(s) (Alphabetically)	Praveen Sharma, Santoshi Sengupta	

COURSE OUTCOMES		COGNITIVE LEVELS
C303-6.1	Understand human resource management from a strategic perspective and analyze environmental challenges that impact HRM of an organization	Analyze Level (C4)
C303-6.2	Assess the human resource needs of the organization and design recruitment and selection strategies for an organization	Evaluate Level (C5)
C303-6.3	Evaluate the processes of training and development, mentoring, performance management, compensation and reward management in	Evaluate Level

	an organization and design effective strategies for the same	(C5)
C303-6.4	Critically assess career management system, work-life initiatives and other HRM practices of the organization	Evaluate Level (C5)

Module No.	Subtitle of the Module	Topics in the module	No. of Hours for the module
1.	Introduction	Role of HR in strategy; Evolution of SHRM; Strategic fit: Conceptual Framework; Theoretical Perspectives on SHRM; SHRM approaches in Indian context	4
2.	Strategic Human Resource Environment and Evaluation	Overview of the environment; SHRM in Knowledge Economy; HRM and Firm Performance; Rationale for HR Evaluation; Approaches to HR Evaluation	4
3.	Strategic Human Resource Planning and Acquiring	Overview of HRP; Objectives of HRP; Job Analysis and SHRM; External and Internal Influences on Staffing; Recruitment: Sources, Methods and Approaches; Selection: Methods and Approaches; Strategic Recruitment and Selection	6
4.	Training, Development, Mentor Relationships	Basic Concepts, Purposes & Significance of Training and Development; HRM Approaches; Linkage between Business Strategy and training; Process; new Developments; Concept and outcomes of mentoring; Strategic approach of Mentoring relationships	4
5.	Strategic Performance Management; Compensations and Reward Management; Career Management	Developing performance management systems; Technology and performance management; Strategic Linkage of performance management; Determinants and approaches of compensation and rewards; New Developments; Business Strategy and compensation; Career Management systems; SHRM approach to career management	6
6.	Work Life Integration and International HRM	HRD Approaches to work-life integration; Development of work-life initiatives; Strategic approach to work-life integration; External HRM; IHRM practices	4

Total number of Lectures	28
Evaluation Criteria	
Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Projects -Report and Viva, Oral Questions)
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Tanuja Agarwala, Strategic Human Resource Management, 1 st edition, Oxford University Press, 2007
2.	Stephen J. Perkins, Susan M. Shortland, Strategic International Human Resource Management: Choices and Consequences, Kogan Page, 2010
3.	John storey, Patrick Wright and Dave Ulrich, Strategic Human Resource Management, Routledge Taylor and Francis Group, 2009

Detailed Syllabus

Lecture-wise Breakup

Course Code	17B1NHS531	Semester ODD (specify Odd/Even)	Semester 5 Session 2018 -2019 Month from July 2018-Dec2018
Course Name	Technology and Culture		
Credits	3	Contact Hours	(2-1-0)

Faculty (Names)	Coordinator(s)	Dr Swati Sharma
	Teacher(s) (Alphabetically)	Dr Swati Sharma

CO Code	COURSE OUTCOMES	COGNITIVE LEVELS
C303-5.1	Understand and apply the main theories in cultural management,	Applying (C4)
C303-5.2	Identify technological convergence and cultural divergence, relate the differences to the literature and suggest solutions	Evaluating(C 5)
C303-5.3	Interpret and communicate effectively in physical and virtual teams by choosing appropriate concepts, logic and selecting the apt IT tools.	Analyzing(C4)
C303-5.4	Application of the theoretical knowledge to adapt to cultural differences in global work environment.	Evaluating(C 5)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction	<ul style="list-style-type: none">▪ Genealogy of the concept▪ The Information Technology Revolution▪ The concept of Network societies	5

2.	Dimensions of Culture	<ul style="list-style-type: none"> ▪ Evolution of Culture ▪ Principal theories of Culture: Kluckhohn and Strodtbeck, Hofstede, Trompenaars and Schwartz ▪ Cultural Diversity and cross cultural literacy 	8
3.	Cross cultural communication in physical and virtual teams	<ul style="list-style-type: none"> ▪ The Communication Process ▪ Language and Culture ▪ Non Verbal Communication ▪ Barriers to Cross Cultural Understanding ▪ Marketing and Culture 	8
4.	Negotiation and Decision Making	<ul style="list-style-type: none"> ▪ Theories of Negotiation ▪ Negotiation and Intercultural Communication ▪ Decision making in cross cultural environment 	2
5.	Cross Culture and Leadership	<ul style="list-style-type: none"> ▪ Leadership and Culture ▪ Theories of Culture centric leadership and their Global Relevance ▪ Developing Competencies for Global citizens ▪ Women as International Leaders ▪ Cross Cultural Training ▪ Ethical Guidelines for Global Citizens 	5
Total number of Lectures			28

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Project, and Oral Viva)
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Maidenhead. Riding the Waves of Culture: Understanding Cultural Diversity in Business (2012). 3rd edition. McGraw Hill.
2.	Edgar, Andrew and Peter Sedgwick (eds.) Key concepts in Cultural Theory. London. Routledge. 1999
3.	Gerard Bannon, J. (red.). Mattock, Cross-cultural Communication: The Essential Guide to International Business. 2003
4.	Grossberg, L., C. Nelson and P. Treichler (eds.) Cultural Studies. London. 1992

5.	Robertson, Ronald. Globalization: Social theory and global culture, London: Sage, 1992.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NHS532	Semester: Odd	Semester V Session 2018-2019 Month from: July 2018 –Dec 2018
Course Name	Planning and Economic Development		
Credits	03	Contact Hours	2-1-0

Faculty (Names)	Coordinator(s)	Dr. Amba Agarwal (JIIT-128), Dr. Monica Chaudhary (JIIT-62)
	Teacher(s) (Alphabetically)	Dr. Amba Agarwal, Dr. Monica Chaudhary, Mr. Manas R. Behera

COURSE OUTCOMES		COGNITIVE LEVELS
After pursuing the above mentioned course, the students will be able to:		
C303-4.1	Understand the issues and approaches to economic development.	Understanding Level (C2)
C303-4.2	Evaluate National income accounting, human development index and sustainable development.	Evaluating Level (C5)
C303-4.3	Apply an analytical framework to understand the structural characteristics of development.	Applying Level (3)
C303-4.4	Analyze the role of Macroeconomic stability & policies and Inflation in the development process.	Analyzing Level (C4)
C303-4.5	Evaluate the importance of federal development and decentralization.	Evaluating Level (C5)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Economic Development and its Determinants	Economic growth and development. Indicators of development. Rostows Stages of Growth. Approaches to economic development.	2

2.	National Income Accounting	National Income Accounting, Green GNP and Sustainable development	4
3.	Indicators of development	PQLI, Human Development Index (HDI) and gender development indices.	3
4.	Demographic Features, Poverty and Inequality	Demographic features of Indian population; Rural-urban migration; Growth of Primary, Secondary and Tertiary Sector.	3
5.	Inflation and Business Cycles	Inflation. Business cycle. Multiplier and Accelerator Interaction.	4
6.	Macro Economic Stability & Policies	Monetary Policy. Fiscal Policy. Role of Central Bank & Commercial banks in the development of the country. Balance of payments; currency convertibility and Issues in export-import policy.	5
7.	Federal Development	The Federal Set-up - The Financial Issues in a Federal Set-up, Principles for Efficient Division of Financial Resources between Governments. Financial Federalism under Constitution. Finance Commissions in India, Terms of References and its Recommendations	4
8.	Planning and Development	Need for planning-Niti Aayog, Decentralisation, Rural and Urban local bodies.	3

Total number of Lectures

28

Evaluation Criteria

Components

Maximum Marks

T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment, Viva & Attendance)
Total	100

Recommended Reading material:

1.	Meier, G.M. , Leading Issues in Economic Development, Oxford University Press, New Delhi, 1970
2.	Todaro, M.P. , Stephen C. Smith , Economic Development, Pearson Education, 2017

3.	Thirwal, A.P. , Economics of Development, Palgrave, 2011
4.	Ghatak, S. , An Introduction to Development Economics, Allen and Unwin, London, 1973
5.	Ahuja, H. L. , Development Economics, S Chand publishing, 2016

Detailed Syllabus

Lecture-wise Breakup

Course Code	17BINHS533	Semester: Odd	Semester V Session 2018 -2019 Month from: July 2018 to Dec. 2018
Course Name	Marketing Management		
Credits	3	Contact Hours	2-1-0

Faculty (Names)	Coordinator(s)	Dr. Deepak Verma
	Teacher(s) (Alphabetically)	Dr. Deepak Verma

COURSE OUTCOMES:		COGNITIVE LEVELS
After pursuing the above mentioned course, student will be able to:		
C304-7.1	To illustrate the fundamentals of marketing, marketing environment and market research	Understanding Level (C2)
C304-7.2	To model the dynamics of marketing mix	Applying Level (C3)
C304-7.3	To demonstrate the implications of current trends in social media marketing and emerging marketing trends.	Understanding Level (C2)
C305-7.4	To appraise the importance of marketing ethics and social responsibility	Evaluating(C5)
C305-7.5	To conduct environmental analysis, design business portfolios and develop marketing strategies for businesses to gain competitive advantage.	Creating (C6)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Understanding New Age Marketing	Defining Marketing For 21 st Century The importance of marketing and marketing's role in business and society. Introduction to Digital Marketing.	5

		<p>Online Communication Tools.</p> <p>The Social Media-Conversations, Community and Content.</p> <p>Affiliate Marketing and Mobile Engagement.</p> <p>The Digital Campaigns</p>	
2	Marketing Environment and Market Research and insights	<p>Internal and external forces impacting marketers.</p> <p>Marketing and Customer Value.</p> <p>Gathering Information and Scanning the environment.</p> <p>Company's Micro and Macro Environment</p> <p>Responding to the Marketing Environment</p>	3
3	Strategic Planning and the marketing Process	<p>Explore the impact of social forces on marketing actions.</p> <p>Describe how technological change affects marketing.</p> <p>Designing the business Portfolio</p> <p>Discuss the Strategic Planning Process and Strategic Marketing Process.</p>	5
4	Consumer and Business Buyer Behavior	<p>Consumer Markets and consumer buyer behavior.</p> <p>The buying decision process.</p> <p>Business Markets and business buyer behavior.</p> <p>Discuss the modern ethical standards.</p>	5
5	Branding	<p>Brand Image, Identity and Association.</p> <p>Product brands and Branding decisions.</p> <p>Product line and mix decisions.</p> <p>Consumer Brand Knowledge.</p> <p>New Product Development and Product life cycle strategies.</p>	4
6	Pricing products: Pricing considerations and strategies	<p>Factors to consider when setting prices.</p> <p>New product pricing strategies.</p> <p>Product mix pricing strategies.</p> <p>Price adjustments and changes.</p>	4
7	The New Age Social Marketing	<p>Ethics and social responsibility in marketing.</p>	2

		<p>Ethical behavior in business.</p> <p>Ethical decision making.</p> <p>Social forces affecting marketing.</p> <p>Impact of culture on marketing.</p> <p>Discuss modern ethical standards.</p> <p>Importance of marketing in CSR and business sustainability.</p>	
Total number of Lectures			28
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 (Project, Assignment and Verbal questions)	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Kotler, Philip and Gary Armstrong, Principles of Marketing, 17 th Edition, New Delhi, Pearson Education, 2017.
2.	Kotler, Philip., and Kevin Lane Keller, Marketing Management, 15 th Edition, New Delhi, Pearson Education, 2014.
3.	Grewal D., &Levy Michael, Marketing, 5 th Edition, Mc graw Hill Education (India) Private Limited 2017.
4.	Winer, Russell S ., Marketing Management, 4 th Edition, Prentice Hall,2014.

Detailed Syllabus

Lecture-wise Breakup

Subject Code	16B1NHS536	Semester: ODD (specify Odd/Even)	Semester: V Session: 2018-2019 Month: JULY-DECEMBER
Subject Name	TECHNOLOGY AND GOVERNANCE		
Credits	3	Contact Hours	(2-1-0)

Faculty (Names)	Coordinator(s)	Dr. Santosh Dev
	Teacher(s) (Alphabetically)	Dr. Santosh Dev

Co Code	Course Objective	Cognitive Level
C303-3.1	Understand the concepts and processes of governance in Indian context	Understanding (C2)
C303-3.2	Critically appraise the importance of technological intervention in governance	Evaluating (C5)
C303-3.3	Examine and appraise Digital India campaign and design solution	Creating (C6)
C303-3.4	Design technological intervention to solve society problems	Creating (C6)

Module No.	Subtitle of the Module	Topics in the module	No. of Lectures for the module
1.	Introduction to the Course	What is Governance? General Introduction about the importance and usability	3
2.	Relation of Technology and Governance	The beginnings of technology Technology and society Technology and culture Technology and Economy Technology and Individual	4
3.	How Information	Development of technology and	

	Technology and the Internet Have Changed the World;	globalization	3
4.	E-Frameworks	A Framework for E-Government: E-Government Principals, E-Services, E-Democracy, E-Management; Strategic Planning	5
5	Digital India	What is Digital India?DeitY, Vision of Digital India, Nine Pillars of Digital India, Institutional Mechanisms at National Level, Composition of Monitoring Committee on Digital India, Challenges & Changes Needed	5
6	Governance Models	Collaborative Governance Model, Good Governance Model	2
7.	Different Uses and the Governance Analytical Framework	Governance as Process, Public Governance, Private Governance, Global Governance, Non Profit Governance, Corporate Governance.	4
8.	Different Uses and the Governance Analytical Framework	Project Governance, Environmental Governance, Internet Governance, Information Technology Governance, Regulatory Governance, Participatory Governance, Multilevel Governance, Meta-Governance and Collaborative Governance.	2
Total number of Lectures			28

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Mark Bevir, <i>Governance: A very short introduction.</i> , Oxford University Press Oxford, UK (2013)
2.	Research Papers: Alexandra Mateescu, Alex Rosenblat and danah boyd, Policy Body-Worn Cameras http://www.datasociety.net/pubs/dcr/PoliceBodyWornCameras.pdf , February 2015. Fung, Archon; Graham Mary, Weil David, Full Disclosure: The Perils and Promise of Transparency, 2008. Gurstein, M. B.,Open data: Empowering the empowered or effective data use for everyone? First Monday, (2011) 16(2)

Veeraraghavan, Rajesh, Introduction & Conclusion in Open Governance and Surveillance: A Study of the National Rural Employment Guarantee Program in Andhra Pradesh, India. (2015).

Li, Tania, The Will to Improve: Governmentality, Development, and the Practice of Politics. 2007

Benjamin, S., Bhuvaneshwari, R., & Rajan, P., Bhoomi : ' E-Governance ' , Or , An Anti-Politics Machine Necessary to Globalize Bangalore ? (2007). (January), 1-53.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NHS 531	Semester : Odd (specify Odd/Even)	Semester : v Session:2018 -2019 Month from: July to December
Course Name	Sociology of Youth		
Credits	3	Contact Hours	(2-1-0)

Faculty (Names)	Coordinator(s)	Prof Alka Sharma
	Teacher(s) (Alphabetically)	Prof Alka Sharma Ms Shikha

CO Code	COURSE OUTCOMES	COGNITIVE LEVELS
C303-2.1	Understand youth and youth culture in sociological perspectives	Understanding(C 2)
C303-2.2	Appraise the ethical, cultural& social issues concerning Youth	Evaluating(C 5)
C303-2.3	Appraise the youth culture and interprets the same	Analyzing(C 5)
C303-2.4	Analyze societal problems related to youth in the evolving society.	Evaluating(C 4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction to Youth	Meaning, characteristics, Youth for Development, Challenges faced by Youth, Youth's roles and responsibilities in society	2
2.	Youth Culture	Concept of Youth Culture	2
3.	Perspectives on Youth Culture	Functionalist, Conflict, Interactionist and Feminist Perspective on Youth Culture, Youth and Gender	3
4.	Youth Development	Principles of Youth Development, Learning theory, Constructivist theory, collaborative learning , Relationships theories, Theories as a tool to understand Youth Culture	6
5.	Socialization of Youth	Role of family, Community, religion, kin and neighborhood, Changing social structures in family, marriage, Youth and changing identities	6
6.	Emerging problems of Youth	Role and Value conflicts, Generation Gap, Career decisions and Unemployment, Emotional adjustment, Coping with pressures of living, Unequal Gender norms, Crime (Social Strain theories),	6

7.	Changing perceptive of Youth and Youth Culture in 21 st century	Role of popular culture and social media, involvement of youth in major decision making institutions, Post-modernity and Youth	3
			...
Total number of Lectures			28
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 (Project, Presentation, Assignment and attendance)	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Tyyskä, V. <i>Youth and Society: The long and winding road</i> , 2nd Ed., Canadian Scholars' Press, Inc. (2008).
2.	White, Rob, Johanna Wyn and Patrizia Albanese. <i>Youth & Society: Exploring the Social Dynamics of Youth Experience</i> . Don Mills, ON: Oxford University Press. (2011).
3.	Bansal, P. <i>Youth in contemporary India: Images of identity and social change</i> . Springer Science & Business Media. (2012).
4.	Furlong, Andy. <i>Youth studies: An introduction</i> . Routledge, (2012).
5.	Blossfeld, Hans-Peter, et al., eds. <i>Globalization, uncertainty and youth in society: The losers in a globalizing world</i> . Routledge, (2006).

Detailed Syllabus

Lecture-wise Breakup

Course Code	18B12HS612	Semester : Odd	Semester: V Session: 2018-19 Month: JULY-DECEMBER
Course Name	Indian Polity and Constitutional Democracy in India.		

Credits	3	Contact Hours	(2-1-0)
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Faculty (Names)	Coordinator(s)	Dr. Chandrima Chaudhuri
	Teacher(s) (Alphabetically)	Dr. Chandrima Chaudhuri

CO Codes	COURSE OUTCOMES	COGNITIVE LEVELS
C303-7.1	Explain the importance of Polity and Constitution.	Understand(C2)
C303-7.2	Interpret the Fundamental Rights and Duties.	Understand (C2)
C303-7.3	Analyze the unity in diversity concept of our Nation	Analyze(C4)
C303-7.4	Analyze various concepts useful to understand the system of governance	Analyze(C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	The Constituent Assembly and the Constitution.	<p>The formation of the Constituent Assembly; the philosophy of the Constitution and its main features.</p> <p>Fundamental Rights and Directive Principles.</p> <p>Concept of Power and Politics</p> <p>Concept of Nation- State</p>	8
2.	Federalism and Decentralization	<p>Centre - state relations;</p> <p>Constitutional provisions regarding emergency and centre-state relations</p> <p>Special provisions for some states and the fifth and sixth schedule areas</p> <p>Third tier of government: Panchayati Raj; urban local bodies</p> <p>Regionalism</p> <p>Ethnicity</p> <p>Globalizations.</p>	14

		Gender and Caste	
3.	Organs of Government	The Legislature: Parliament The Executive: President, Prime Minister and Governor The Judiciary: The Supreme Court	6
Total number of Lectures			28

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (5- attendance, 20-quiz)
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Austin, G. (1979). <i>The Constituent Assembly: Microcosm in Action in The Indian Constitution: Cornerstone of a Nation</i> . New Delhi: Oxford University Press
2.	Bhargava,R. (2008). <i>Politics and Ethics of the Indian Constitution</i> . New Delhi: Oxford University Press
3.	Jha, S. (2008). Rights versus Representation: Defending Minority Interests in the Constituent Assembly, in R. Bhargava. (ed.), <i>Politics and Ethics of the Indian Constitution</i> , New Delhi: Oxford University Press
4.	Kapur, D.& Mehta, P.B. (ed.) (2005) <i>Public Institutions in India: Performance and Design</i> , New Delhi: Oxford University Press
5.	Shankar, B.L., & Rodrigues, V. (2011) <i>The Indian Parliament: A Democracy at Work</i> , New Delhi: Oxford University Press
6.	Manor, J. (1994). The Prime Minister and the President, in B.D. Dua, and J. Manor (eds.) <i>Nehru to the Nineties : The Changing Office of the Prime Minister in India</i> , Vancouver: University of British Columbia Press

Detailed Syllabus

Subject Code	15B11CI511	Semester: (specify Odd/Even)	Semester Even Session 2018-2019 Month from JUL'18 to DEC'18
Subject Name	Computer Networks		
Credits	4	Contact Hours	3+1

Faculty (Names)	Coordinator(s)	Dr K. Rajalakshmi
	Teacher(s) (Alphabetically)	Dr. GagandeepKaur Dr. KavitaPandey

		Dr K. Rajalakshmi Kriti Agarwal Dr. Prakash Kumar
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COURSE OUTCOMES		COGNITIVE LEVELS
C310.1	Defining the basics of networking, delay components and underlying technologies	Remembering (Level 1)
C310.2	Illustrate the various key protocols in OSI model and TCP/IP protocol suite and explain various application protocols.	Understanding (Level 2)
C310.3	Examine various transport protocols and its performance enhancing mechanisms.	Analyzing (Level 4)
C310.4	Assess the performance of the network under various routing mechanisms and IP addressing schemes.	Evaluating (Level 5)
C310.5	Identify various multiple access protocol and perform error detection and correction in data communication	Applying (Level 3)

Module No.	Subtitle of the Module	Topics in the module	No. of Lectures for the module
1.	Introduction	Network terminologies, Clients and Servers, Network Models, Protocol layers and their services, Connection Oriented and Connectionless services, Switching Techniques, Physical Media. Network Vulnerability and security	8
2.	The Application Layer	Principles of Application-Layer Protocols, The World Wide Web: HTTP, File Transfer: FTP, The Internet's Directory Service: DNS, Electronic Mail in the Internet, Introduction to Sockets, Security Aspects in Application layer, HTTPS, SFTP etc., Multimedia Aspects of the Application Layer	6
3.	The Transport Layer	Transport-Layer Services and Principles, Multiplexing and	8

		<p>Demultiplexing Applications, UDP and TCP, Connection Establishment, Transport Layer Protocols (go back N, stop and wait, selective repeat), Flow Control and Error Control, Principles of Congestion Control, TCP</p> <p>Congestion Control, Attack and vulnerability issues in</p> <p>Transport layer: Denial of Service (DoS), Distributed Denial of Service (DDoS) etc., Transport layer Security aspects, SSL, TLS etc., Multimedia aspects of the</p> <p>Transport layer</p>	
4.	The Network Layer	<p>Introduction and Network Service Model, Routing Principles, Hierarchical Routing, IP: the Internet Protocol, Routing in the Internet, Broadcast and multicast routing,</p> <p>IPSec Architecture: Authentication Header (AH) and Encapsulating Security Payload (ESP), Multimedia networking aspects and applications</p>	10
5.	The Link Layer and Local Area Networks	<p>The Data Link Layer: Introduction, Services, Error Detection and Correction, Multiple Access Protocols and LANs, LAN Addresses and ARP, Ethernet, PPP: the</p> <p>Point-to-Point Protocol, Introduction to ATM, MPLS and Sonet, IEEE MAC Security Standard, MACSec (802.1AE),</p> <p>Multimedia aspects of the DL layer</p>	8
6.	Wireless Networks	<p>Introduction, Wireless links and characteristics, Architecture, AODV and DSR wireless routing protocols</p>	2
Total number of Lectures			42
Evaluation Criteria			
Components	Maximum Marks		

T1	20	
T2	20	
End Semester Examination	35	
TA	25 (Assignments, Quiz, Attendance)	
Total	100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1	James Kurose, Keith Ross,” Computer Networking: A Top-Down Approach Featuring the Internet “, Addison Wesley
2	Andrew S. Tanenbaum ,”Computer Networks “, Prentice-Hall Publishers
3	Larry Peterson , Bruce Davie ,”Computer Networks a Systems Approach “, Morgan Kaufmann
4	William Stallings ,”Data and Computer Communications”, Prentice Hall
5	K. Thramboulidis, A. Mikroyannidis, “Using UML for the Design of Communication Protocols: The TCP Case Study” 11th International Conference on Software, Telecommunications and Computer Networks, October 7-10, 2003.
6	JuhaParssinen, Niklas von Knorring,JukkaHeinonen, MarkkuTurunen, “UML for Protocol Engineering-Extensions and Experiences”, Proceedings of the Technology of Object-Oriented Languages and Systems (TOOLS),. IEEE Computer Society, page 82, 2000

Detailed Syllabus

Course Code	15B22CI521	Semester Odd (specify Odd/Even)	Semester VII Session 2018 -2019 Month: from July 2018
Course Name	Cloud based enterprise systems		
Credits	3	Contact Hours	3+1

Faculty (Names)	Coordinator(s)	VikasHassija
	Teacher(s) (Alphabetically)	VikasHassija

COURSE OUTCOMES		COGNITIVE LEVELS
C311.1	Define all the basic terminologies related to cloud computing and basic nodejs concepts.	Remember Level (Level 1)
C311.2	Write basic nodejs programs for creating server, rendering html, routing, get and post methods.	Understand Level (Level 2)
C311.3	Develop all nodejs programs using nested loops and api methods to restrict post and get requests.	Apply Level (Level 3)

C311.4	Test for the issues in the existing code using debugging tools or other exception handling methods.	Analyze Level (Level 4)
C311.5	Basic understanding of the importance of various advanced concepts of big data like hadoop, mapreduce, mongodb, combiners, practitioners, pig and hive.	Evaluate Level (Level 5)
C311.6	Create or design an end to end API using nodejs and store the posted data in a mongodb collection.	Create Level (Level 6)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Module 1: Cloud computing defined	We will introduce and define cloud computing and cloud based enterprise systems, explain the structure and operational aspects of cloud systems, and compare different types of cloud based applications.	8
2.	Module 2: Basics of Node js	We will discuss the basics of node js programming language. We will be creating web pages, connect them using routing functions and create basic APIs to interact with the data structure.	6
3.	Module 3: Big data	We will discuss the concept of Big data and the need of Big data storage and analysis. We will be defining various V's in big data and the end to end process of data generation, cleaning, analysis and decision making.	5
4.	Module 4: Hadoop and Mapreduce	The purpose of this module is to introduce the concept of hadoop and maps reduce in big data. We will be studying the detailed architecture of hadoop, the way files are stored and retrieved from hadoop and the concept of name nodes. We will be studying the algorithms used in map reduce to analyze the data.	7
5.	Module 5: Nosql basics	The purpose of this module is to introduce the basics of Nosql. We will be discussing a lot about the differences of sql and nosql data bases. We will be studying the CAP theorem to form the foundation of nosql data bases. We will be also studying the format of data stored in nosql data bases.	7
6.	Module 6: Mongo db	We will explore the most commonly used nosql database i:e mongo db. We will be running various basic and complex commands to query the collections in mongodb data base.	3
7.	Module 7: AWS,	We will explore practically the implementation of web	5

	Azure and Dockers	applications on different cloud service providers like AWS and Azure. We will be studying the concept of dockers and will be comparing it to virtual machines.	
Total number of Lectures			42
Evaluation Criteria			
Components		Maximum Marks	
T1		20	
T2		20	
End Semester Examination		35	
TA		25 (Attendance , Assignment and Quiz)	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	"Cloud Computing: From Beginning to End" written by Mr. Ray J Rafaels
2.	Big Data: A Revolution That Will Transform How We Live, Work, and Think
3.	Hadoop: The Definitive Guide, 4th Edition by Tom White
4.	IEEE Transactions on cloud computing
5	ACM Transactions on cloud computing

Detailed Syllabus

Lab-wise Breakup

Course Code	15B17CI571	Semester : Odd (specify Odd/Even)	Semester V Session 2018 -2019 Month from July- Dec
Course Name	Computer Networks Lab		
Credits	1	Contact Hours	2

Faculty (Names)	Coordinator(s)	Kirti Aggarwal
	Teacher(s) (Alphabetically)	Kavita Pandey, Kirti Aggarwal, K. Rajalakshmi, Nisha Chaurasia

COURSE OUTCOMES		COGNITIVE LEVELS
C370.1	Classify all the wired/wireless technologies and the basic network building blocks	Level 2 (Understanding)
C370.2	Visualize and analyze the data packets of different TCP/IP layers. Store the data packets as *.pcap files.	Level 3 (Applying)
C370.3	Create client and server applications using the "Sockets" and the implementation of various protocols at Data link and TCP layer	Level 4 (Analyzing)
C370.4	Model a communication network and Estimate the delay caused in the network due to congestions and link breakages.	Level 5 (Evaluating)
C370.5	Simulate and compare different routing algorithms, error detection and correction and buffer management techniques	Level 3 (Applying)

Module No.	Title of the Module	List of Experiments	CO
1.	Basics of Networking	To Classify all the wired/wireless technologies and the basic network building blocks	CO1
2.	Wireshark	To make some simple packet captures and observations.	CO2
3.	Wireshark	To explore several other aspects of the HTTP protocol	CO2
4.	Socket Programming	To create a socket and bind it to a specific address and port	CO3
5.	Socket Programming	To send and receive a HTTP packet and learn some basics of HTTP header format.	CO3
6.	NS2	Write program to create network Topologies in NS2	CO4
7.	NS2	To send some traffic/data in the network topologies created and reading the trace file.	CO4
8.	NS2	Using Trace File and Plotting using AWK scripts and Xgraph- Trace Analysis	CO4
9.	NS2	To Route the packets in the network and study about Network Dynamics	CO4
10.	Routing	Implementation of Routing Algorithms	CO5
11.	Error Correction & Detection	To Implement various Error Correction and Detection Algorithms	CO5
Evaluation Criteria			
Components		Maximum Marks	
Lab Test 1		20	
Lab Test 2		20	
Day to Day Evaluation 1		60	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Kurose, J. F., Computer networking: A top-down approach featuring the internet, 3/E. Pearson Education India, (2005).
2.	Forouzan, A. B., Data Communication and Networking, (2007).
3.	Issariyakul, T., & Hossain, E. Introduction to Network Simulator 2 (NS2). In Introduction to network simulator NS2(pp. 1-18). Springer, (2009).

4.	Orebaugh, A., Ramirez, G., & Beale, J., Wireshark & Ethereal network protocol analyzer toolkit. Elsevier, (2006).
5.	Goerzen, J., Foundations of Python network programming. Apress, (2004).

Detailed Syllabus

Lab-wise Breakup

Subject Code	15B28CI581	Semester odd	Semester Sixth Session 2018- 2019 Month from Jan to June
Subject Name	CLOUD BASED ENTERPRISE SYSTEMS LAB(15B28CI581)		
Credits	1	Contact Hours	2

Faculty (Names)	Coordinator(s)	Prashant kaushik
	Teacher(s) (Alphabetically)	Prashant kaushik

COURSE OUTCOMES		COGNITIVE LEVELS
C371.1	Create Server app and its modules	Create Level (Level 6)
C371.2	Develop multi core server apps	Apply Level (Level 4)
C371.3	Use nodejs for multi core apps	Apply Level (Level 4)
C371.4	Design Auto Scale apps for server	Apply Level (Level 4)
C371.5	Analyse the VMs for the cloud deployment	Evaluate Level (Level 6)
C371.6	Understand the cloud concept for App dev.	Understand Level (Level 2)

Module No.	Title of the Module	List of Experiments	CO
1.	Hypervisor Virtual machine (PAAS, IAAS, VAAS)	Use hypervisor scripts to create VMs	4
2.	Types of virtual machine (compute, storage, etc) AWS EC2	Create Storage and compute virtual machines	2
3.	Private Clouds and Public clouds software virtualization. Lambda	Install openstack on personal PC	1
4.	S3cloud orchestration Python scripts for load balancing. DynamoDB	Use S3to host files	2
5.	VPC - cloud networking Backup and recovery	Create a VPC of two node cluster in AWS	3
6.	Billing and Alerts OpenStack using dev stack and more python scripts	Install billing policy in Open stack	5
Evaluation Criteria			
Components		Maximum Marks	
LabTest 1		20	
LabTest 1		20	
Day 2 Day		60	
Total		100	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text

books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1. Cloud Computing for Complete Beginners: Building and Scaling High-Performance Web Servers on the Amazon Cloud by Ikram Hawaramani

2. AWS System Administration: Best Practices for Sysadmins in the Amazon Cloud by Mike Rayan , 2018

3. AWS Scripted: How to Automate the Deployment of Secure and Resilient Websites with Amazon Web Services VPC, ELB, EC2, RDS, IAM, SES and SNS by Christian cerri, 2014

Detailed Syllabus

Lab-wise Breakup

Course Code	15B28CI582	Semester ODD (specify Odd/Even)	Semester V Session 2018 -2019 Month from July – Dec 2018
Course Name	Multimedia Development Lab		
Credits	1	Contact Hours	0-0-2

Faculty (Names)	Coordinator(s)	Dr. Suma Dawn
	Teacher(s) (Alphabetically)	Dr. Suma Dawn

COURSE OUTCOMES		COGNITIVE LEVELS
C372.1	Illustrate aesthetics of visual composition.	Understanding Level (Level 2)
C372.2	Demonstrate various operations in Adobe Photoshop CS5 such as, applying filters and effects, colour and tonal adjustments, automating tasks, image editing, image enhancement, image restoration, etc.	Understanding Level (Level 2)
C372.3	Design graphics & user interfaces using Adobe Photoshop CS5	Creating Level (Level 6)
C372.4	Demonstrate various operations in Adobe Illustrator CS5 such as, adding typography, creating, editing & using brushes, applying filters & effects, etc.	Understanding Level (Level 2)
C372.5	Create graphics layouts, illustrations and vector drawing using Adobe Illustrator CS5.	Creating Level (Level 6)
C372.6	Design 2D animations using key framing, interactive animation using action scripting, and fun games.	Creating Level (Level 6)

Module No.	Title of the Module	List of Experiments	CO
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1	<i>Introduction to Digital Graphics</i>	<ul style="list-style-type: none"> • Photoshop, Illustrator, Flash tool study • Poster Design, Game Design, UI Design, Logo Design, Doodle Design • Understanding Storyline 	Understanding Level (Level 2)
2	<i>Adobe Photoshop CS5</i>	<ul style="list-style-type: none"> • Poster Creation • Logo Creation • Collage Creation • Brochure Creation • Photograph Manipulations • UI design in Photoshop 	Understanding Level (Level 2) Creation Level (Level 6)
3	Adobe Illustrator CS5	<ul style="list-style-type: none"> • 3D Logo Designing • Stylizing Text • Brush designing • Making Illustrative Drawing • Scene Design as per requirement specification • Designing a Comic Strip based on a given Storyline 	Understanding Level (Level 2) Creation Level (Level 6)
4	Animation Concepts & Design	<ul style="list-style-type: none"> • Introduction to Keyframing, timeline headers, symbols and other Flash Concepts, Extracting a drawing from a picture, Buttons and their usage: Rolling dice, Invisible button, Masking, Zooming, Depth Management With the Display List in AS3, Actionscript usage for simple projects • Designing small games • Designing Animation based on given storyline. 	Understanding Level (Level 2) Creation Level (Level 6)

Evaluation Criteria

Components

Maximum Marks

Lab Test 120

Lab Test 220

Day-to-Day- Evaluation45

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Day-to-Day- Attendance15

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Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
<u>Multimedia, Photoshop and Illustrator</u>	<ol style="list-style-type: none"> 1. “Multimedia – An Introduction” by John Villamil and Louis Molina. 2. “Multimedia Magic” by Gokul, S. 3. “Real World Illustrator 9” by Deke McClelland and Sandee Cohen. 4. “Photoshop 6 Primer” by Jason I. Miletsky. 5. “Mastering Photoshop 6” by Steve Romaniello.
<u>Flash & ActionScript</u>	<ol style="list-style-type: none"> 6. Adobe Flash CS3 Professional Bible by Robert Reinhardt and Snow Dowd 7. ActionScript 3.0 in Flash CS3 Professional Beyond the Basics by Todd Perkins <p><u>Web links Links:</u></p> <p>http://www.flashandmath.com/flashcs5/index.html</p> <p>http://helpx.adobe.com/flash/topics.html</p> <p>http://www.republicofcode.com/tutorials/flash/</p> <p><u>Flash CS4/CS5 Platform Game Tutorials -</u></p> <ol style="list-style-type: none"> 8. http://www.entheosweb.com/flash/default.asp
Additional reading material may be given to the students as and when required.	

Detailed Syllabus

Lab-wise Breakup

Course Code	15B29CI590	Semester Odd (specify Odd/Even)	Semester V Session 2018 -2019 Month from July-December
Course Name	Minor Project (IT)		
Credits	5	Contact Hours	

Faculty (Names)	Coordinator(s)	Prakash Kumar
	Teacher(s) (Alphabetically)	Archana Purwar, Indu Chawla, Parul Agarwal, Prakash Kumar, Sakshi Agarwal, Satish Chandra, Suma Dawn

COURSE OUTCOMES		COGNITIVE LEVELS
C350.1	Analyze chosen literature addressing real world research problem to identify the requirements	Analyze Level (Level 4)
C350.2	Build technical report detailing the software specification, design, test plan, and implementation details.	Apply Level (Level 3)
C350.3	Build a practicable solution for the research problem	Create Level (Level 6)
C350.4	Evaluate results to test the effectiveness of the proposed solution	Evaluate Level (Level 5)
C350.5	Develop effective communication skills for presentation of project related activities	Apply Level (Level 3)