Detailed Syllabus
Lecture-wise Breakup

Subject Code	**19B12HS311**	**Semester: ODD**	**Semester V Session 2019-20** **Month from July 2019 to December 2019**
Subject Name	**ENTREPRENEURIAL DEVELOPMENT**		
Credits	**3**	**Contact Hours**	**2-1-0**

Faculty (Names)	**Coordinator(s)**	**Dr Badri Bajaj**
	Teacher(s) (Alphabetically)	**Dr Badri Bajaj**

COURSE OUTCOMES		**COGNITIVE LEVELS**
C303-8.1	Understand basic aspects of establishing a business in a competitive environment	Understand Level (C2)
C303-8.2	Apply the basic understanding to examine the existing business ventures	Apply Level (C3)
C303-8.3	Examine various business considerations such as marketing, financial and teaming	Analyze Level (C4)
C303-8.4	Assessing strategies for planning a business venture	Evaluate Level (C5)

Module No.	**Subtitle of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	Entrepreneurial perspective	Foundation, Nature and development of entrepreneurship, importance of entrepreneurs, Entrepreneurial Mind, Individual entrepreneur Types of entrepreneurs	4
2.	Beginning Considerations	Creativity and developing business ideas; Legal issues; Creating and starting the venture; Building a competitive advantage	7
3.	Developing Marketing Plans	Developing a powerful Marketing Plan, E-commerce, Integrated Marketing Communications	7
4.	Developing Financial Plans	Sources of Funds, Managing Cash Flow, Creating a successful Financial Plan Developing a business plan	6
5.	Leading Considerations	Developing Team, Leading the growing company, Resources for growth	4
Total number of Lectures			**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment 1, Assignment 2, 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.	Robert D Hisrich, Michael P Peters & Dean A Shepherd, "Entrepreneurship" 10th Edition, McGraw Hill Education, 2018
2.	Norman M. Scarborough and Jeffery R. Cornwell, "Essentials of entrepreneurship and small business management" 8th Edition, Pearson, 2016
3.	Rajiv Roy, "Entrepreneurship", 2nd Edition, Oxford University Press, 2011
4.	Sangeeta Sharma, "Entrepreneurship Development", 1st Edition, Prentice-Hall India, 2016

Course Description

Course Code	16B1NMA533	**Semester** - Odd **(specify Odd/Even)**	**Semester** 5th **Session** 2019 -2020 **Month from** July 2019 - Dec 2019
Course Name	Matrix Computations		
Credits	4	**Contact Hours**	3+1

Faculty (Names)	**Coordinator(s)**	Dr. Pato Kumari and Dr. Amita Bhagat
	Teacher(s) (Alphabetically)	Dr. Amita Bhagat Dr. Neha Singhal Dr. Pato Kumari

COURSE OUTCOMES		**COGNITIVE LEVELS**
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, inner product space, norm of a vector and matrix.	**Understanding level (C2)**
C301-3.4	apply the Gram-Schmidt process to construct orthonormal basis and Q-R decomposition of a matrix.	**Applying Level (C3)**
C301-3.5	construct Gershgorin's circles and solve eigenvalue problem using Jacobi, Givens, Housholder, 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	Review of matrices, partitioning, block diagonal matrix, elementary matrices, Inverse of a matrix by partitioning	6
2.	Linear System of equations	Existence and uniqueness of solution for system of linear equations, Gauss Siedel, Gauss Jacobi and partial pivoting	6
3.	Vector and Inner Product Spaces	Vector spaces, Subspaces, dimension and basis, *p*-norms of vector, Inner product, Norm using inner product and norms of a matrix	6
4.	Eigen value Problems	Eigen values and Eigenvectors, spectral radius, Greshgorin's theorem, Jacobi method, Givens rotations method and Householder's method, Power and Inverse power methods, LU decomposition, Crout's and Doolittle's method, Cholesky factorization.	10
5.	Orthogonality	Orthogonal and orthonormal sets, Gram-Schmidt process, QR factorization, Q-R algorithm	6
6.	Matrix Calculus	Powers and functions of matrices, application to solve discrete dynamical systems $x(t+1) = Ax(t)$, $x(0) = \alpha$ and a system of differential equations of the form $dx/dt = Ax$, $x(0) = \alpha$.	8
		Total number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignments, Quizzes and Tutorial)
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.

Detailed Syllabus

Lecture-wise Breakup

Course Code	16B1NMA731	**Semester** ODD **(specify Odd/Even)**	**Semester** 5th **Session** 2019 -2020 **Month from** June 19 to Dec 19
Course Name	Theory of Numbers		
Credits	4	**Contact Hours**	3-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Puneet Rana
	Teacher(s) (Alphabetically)	Dr. Puneet Rana

COURSE OUTCOMES		**COGNITIVE LEVELS**
C301-4.1	explain Euclid algorithm, linear Diophantine equations and prime numbers.	Explain [Level 2]
C301-4.2	solve system of linear congruences using properties of congruences.	Apply [Level 3]
C301-4.3	explain numbers of special form and number theoretic functions.	Explain [Level 2]
C301-4.4	apply the concepts of order, primitive roots and indices to solve conguences.	Apply [Level 3]
C301-4.5	apply Legendre symbol and quadratic reciprocity theorem to solve quadratic congruences.	Apply [Level 3]
C301-4.6	apply and analyse the concepts of number theory in hashing, cryptography, calendar and ISBN check digits problems.	Analyzing [Level 4]

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	8

		only), Goldbach and twin primes conjectures.	
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, Cyptosystem, 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**, *Elementary Number Theory*, Waveland Press,,2001

2. **Kenneth Rosen**, *Elementary Number Theory and its Applications*, 5th Edition, 2005

3. **I. Niven, H. Zuckerman, H. Montgomery**, *An Introduction to the Theory of Numbers*, 5th Edition, Wiley, 2013.

4. **David M. Burton**, *Elementary Number Theory*, 7th Edition, McGraw Hill Education (India) Private Limited, 2006

Department Name

AY: 2019-20 (Odd Semester)

Course Opening Report

Programme Name: B. Tech.

Semester: V

Course Name & Code: **Quantum Mechanics for Engineers (16B1NPH531)**

Course Outcomes:

At the completion of the course, students will be able to,

S.N.	DESCRIPTION	COGNITIVE LEVEL
C301-10.1	Remember basics of Quantum Mechanics and its applications.	C1
C301-10.2	Explain postulates of quantum mechanics, Dirac notation, Schrödinger Equation, Perturbation theory and Qubits.	C2
C301-10.3	Solve various problems related to different quantum systems and construct quantum circuits using quantum gates.	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.	C4

CO-PO and CO-PSO Mapping:

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
C301-10.1	3	2	1	1								1		
C301-10.2	3	2	1	1	1							1		
C301-10.3	3	3	2	2	1							1		
C301-10.4	3	3	3	3	2							1		
Avg.	3	3	2	2	1							1		

	CSE		IT		ECE	
COs	PSO 1	PSO 2	PSO 1	PSO 2	PSO 1	PSO 2
C301-10.1					1	
C301-10.2	1				2	1
C301-10.3	1				2	1
C301-10.4	1				2	1
C301-10	1				2	1

Identified Curriculum Gaps (If Any):

Topics to be introduced	Strengthens CO	Strengthens PO, PSO	Method of Identification
Nil	Nil	Nil	Nil

Modifications in Curriculum (If Any):

Details of Modification	Justification
Nil	Nil

Actions for Improving CO Attainments: ECE

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-10.1	3.0	Nil	
C301-10.2	2.8	Nil	
C301-10.3	2.0	Nil	
C301-10.4	1.1	Students are facing problem in measurement theory and perturbation theory	A complete tutorial dedicated to measurement theory and perturbation theory with questions in increasing order of difficulty.

Actions for Improving CO Attainments: CSE

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-10.1	3.0	Nil	

C301-10.2	2.6	**Nil**	
C301-10.3	2.0	**Nil**	
C301-10.4	1.1	**Students are facing problem in measurement theory and perturbation theory**	**A complete tutorial dedicated to measurement theory and perturbation theory with questions in increasing order of difficulty.**

Innovative Teaching and Learning Method to be used (if any): The quantum mechanics course consists of difficult topics like measurement theory, perturbation theory and quantum circuits. One needs to start with simple problems on the subject and increase the complexity.

Innovative Evaluation Strategy to be used (If any): None

Signature:

Module Coordinator: Dr. S. K. Awasthi

Signature:

Course Coordinator: Dr. Anuraj Panwar & Dr Vikas Malik

Department of Physics and Materials Science & Engineering

AY: 2019-20 (Odd Semester)

Course Opening Report

Programme Name: B. Tech

Semester: V

Course Name & Code: Material Sciences (16B1NPH532)

Course Outcomes:

Upon the completion of this course, students will be able to,

S.N.	DESCRIPTION	COGNITIVE LEVEL
C301-11.1	Recall variety of engineering materials for their applications in contemporary devices	C1
C301-11.2	Explain dielectric, optical, magnetic, superconducting, polymer and thermoelectric properties	C2
C301-11.3	Apply properties of dielectric, optical, magnetic, superconducting, polymer and thermoelectric materials to solve related problems	C3
C301-11.4	Prove and estimate solution of numerical problems using physical and mathematical concepts involved with various materials	C4

CO-PO and CO-PSO Mapping:

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
C301-11.1	3	3	1	1								2
C301-11.2	3	2	1	1								1
C301-11.3	3	2	1	1								1
C301-11.4	3	3	3	2								1
Av.	3	3	2	1								1

	CSE		IT		ECE	
COs	PSO1	PSO2	PSO1	PSO2	PSO1	PSO2
C301-11.1						
C301-11.2						
C301-11.3						
C301-11.4						
C301-11						

Identified Curriculum Gaps (If Any):

Topics to be introduced	Strengthens CO	Strengthens PO, PSO	Method of Identification
Nil	**Nil**	**Nil**	**NA**

Modifications in Curriculum (If Any):

Details of Modification	Justification
NA	NA

Actions for Improving CO Attainments CSE:

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-11.1	2.7	Nil	
C301-11.2	1.2	Explanation to logical aspect of material	Emphasis will be given to the logical and reasoning aspect of the material behavior under certain conditions
C301-11.3	1.4	Problem solving on the basis of complex formulae	Comprehensive problem solving will be carried out in tutorials
C301-11.4	0.84	Prove and estimation of mathematical equations	Emphasis on starting points of proofs with required background will be provided in detail

Actions for Improving CO Attainments IT:

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-11.1	2.7	Nil	
C301-11.2	0.6	Explanation to logical aspect of material	Emphasis will be given to the logical and reasoning aspect of

			the material behavior under certain conditions
C301-11.3	0.8	**Problem solving on the basis of complex formulae**	**Comprehensive problem solving will be carried out in tutorials**
C301-11.4	0.8	**Prove and estimation of mathematical equations**	**Emphasis on starting points of proofs with required background will be provided in detail**

Actions for Improving CO Attainments ECE:

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-11.1	2.4	**Nil**	
C301-11.2	1.2	**Explanation to logical aspect of material**	**Emphasis will be given to the logical and reasoning aspect of the material behavior under certain conditions**
C301-11.3	1.4	**Problem solving on the basis of complex formulae**	**Comprehensive problem solving will be carried out in tutorials**
C301-11.4	0.8	**Prove and estimation of mathematical equations**	**Emphasis on starting points of proofs with required background will be provided in detail**

Innovative Teaching and Learning Method to be used (if any): Material science is a comprehensive course in view of material knowledge for industry based applications and thus relevant examples will be shown and discussed in lecture content as well as assignments given to students.

Innovative Evaluation Strategy to be used (If any): None

Signature:

Module Coordinator: Dr Manoj Kumar

Signature:

Course Coordinator: Prof. R. K. Dwivedi & Dr. Sandeep Chhoker

Department of Physics and Materials Science and Engineering

AY: 2019-20 (Odd Semester)

Course Opening Report

Programme Name: B. Tech

Semester: 5th

Course Name & Code: Laser Technology and Applications (16B1NPH533)

Course Outcomes:

At the completion of the course, students will be able to,

S. No.	DESCRIPTION	COGNITIVE LEVEL
C301-12.1	Define the coherent properties, high brightness of laser, population inversion and optical feedback to laser technology	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	C2
C301-12.3	Apply the optical ray transfer matrix to determine the stability of a laser resonator	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	C4

CO-PO and CO-PSO Mapping:

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
C301-12.1	3	1	1	2								3
C301-12.2	3	3	2	2								3
C301-12.3	3	3	2	2	2							2
C301-12.4	3	3	2	3	2							2
Avg.	3	3	2	2	2							3

	CSE		IT		ECE	
COs	PSO1	PSO2	PSO1	PSO2	PSO1	PSO2
C301-12.1						
C301-12.2						

C301-12.3					1	
C301-12.4					1	
C301-12					1	

Identified Curriculum Gaps (If Any): Nil

Topics to be introduced	Strengthens CO	Strengthens PO, PSO	Method of Identification

Modifications in Curriculum (If Any): Nil

Details of Modification	Justification

Actions for Improving CO Attainments: ECE

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-12.1	2.6	**Nil**	
C301-12.2	3.0	**Nil**	
C301-12.3	1.4	**Students faced problems in optical ray transfer matrix method**	**More emphasis to give on optical ray transfer matrix method**
C301-12.4	3.0	**Nil**	

Actions for Improving CO Attainments: CSE

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-12.1	2.6	**Nil**	
C301-12.2	2.6	**Nil**	
C301-12.3	0.6	**Students faced problems in optical ray transfer matrix method**	**More emphasis to give on optical ray transfer matrix method**
C301-12.4	2.2	**Nil**	

Actions for Improving CO Attainments: IT

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-12.1	2.6	**Nil**	
C301-	1.2	**Students faced problems in**	**More emphasis to give on laser applications**

12.2		**understanding laser applications**	
C301-12.3	3.0	**Nil**	
C301-12.4	3.0	**Nil**	

Innovative Teaching and Learning Method to be used (if any): None

Innovative Evaluation Strategy to be used (If any): None

Signature:

Module Coordinator: Dr. Navendu Goswami

Signature:

Course Coordinator: Dr. Navneet K. Sharma & Dr. Amit Verma

Department Name

AY: 2019-20 (Odd Semester)

Course Opening Report

Programme Name: B.Tech

Semester: Vth

Course Name & Code: Nuclear Science and Engineering (16B1NPH535)

Course Outcomes:

At the completion of the course, students will be able to,

COURSE OUTCOMES		COGNITIVE LEVELS
C301-14.1	Relate terminology and concepts of nuclear science with various natural phenomenon and engineering applications.	Remember Level (Level 1)
C301-14.2	Explain various nuclear phenomenon, nuclear models, mass spectrometers, nuclear detectors, particle accelerators. and classify elementary particles.	Understand Level (Level 2)
C301-14.3	Solve mathematical problems for various nuclear phenomenon and nuclear devices.	Apply Level (Level 3)
C301-14.4	Analyze the results obtained for various physical problems and draw inferences from the results.	Analyze Level (Level 4)

CO-PO and CO-PSO Mapping:

COs	CO Attainments	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2.2	3	3	3	1	1							2		
CO2	2.0	3	3	3	2	1							1		
CO3	0.6	3	3	3	2	1							1		
CO4	1.2	3	3	3	2	1							1		
NBA Code: C301-		3	3	3	2	1							1		

14														

	CSE		IT		ECE	
COs	**PSO 1**	**PSO 2**	**PSO 1**	**PSO 2**	**PSO 1**	**PSO 2**
C301-14.1						
C301-14.2						
C301-14.3						
C301-14.4						
C301-14						

Identified Curriculum Gaps (If Any):

Topics to be introduced	Strengthens CO	Strengthens PO, PSO	Method of Identification
Nil	Nil	Nil	Nil

Modifications in Curriculum (If Any):

Details of Modification	Justification
Nil	Nil

Actions for Improving CO Attainments: ECE

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-14.1	2.2	Nil	

C301-14.2	2.0	Nil	
C301-14.3	0.6	Students are facing problem in solving numerical problems.	Extra numerical problems may be provided to students so that they can have more practice.
C301-14.4	0.8	Students are facing problem in analyzing results and drawing inferences from results obtained.	Extra numerical problems will help students to analyze results.

Actions for Improving CO Attainments: CSE

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-14.1	2.2	Nil	
C301-14.2	2.0	Nil	
C301-14.3	0.6	Students are facing problem in solving numerical problems.	Extra numerical problems may be provided to students so that they can have more practice.
C301-14.4	1.2	Students are facing problem in drawing inferences from results obtained.	Extra numerical problems will help students to analyze results.

Actions for Improving CO Attainments: IT

COs	Attainments in 2018-19	Identified Gap	Action to be taken in 2019-20 to improve CO attainment
C301-14.1	1.4	Students are facing problem in measurement theory and perturbation theory	Doubt classes may be arranged.
C301-14.2	1.2	Students are facing problem in measurement theory and perturbation theory	Doubt classes may be arranged.
C301-14.3	0	Students are facing problem in solving numerical problems.	Extra numerical problems may be provided to students so that they can have more practice.
C301-14.4	0	Students are facing problem in drawing inferences from results obtained.	Extra numerical problems will help students to analyze results.

Innovative Teaching and Learning Method to be used (if any): None

Innovative Evaluation Strategy to be used (If any): None

Signature:

Module Coordinator: Dr Manoj Kumar

Signature:

Course Coordinator: Dr Vivek Sajal

Detailed Syllabus
Lecture-wise Breakup

Course Code	17B1NHS531	**Semester ODD (specify Odd/Even)**	**Semester V Session** 2019 -2020 **Month from July - Dec**
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

COURSE OUTCOMES		**COGNITIVE LEVELS**
C303-5.1	Understand the main theories in cultural management,	Applying (C 2)
C303-5.2	Appraise 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 evaluating appropriate concepts, logic and selecting the apt IT tools.	Evaluating (C5)
C303-5.4	Evaluation 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	▪ Genealogy of the concept ▪ The Information Technology Revolution ▪ The concept of Network societies	5
2.	Dimensions of Culture	▪ Evolution of Culture ▪ Principal theories of Culture: Kluckholn and Strodtbeck, Hofstede, Trompenaars and Schwartz ▪ Cultural Diversity and cross cultural literacy	8
3.	Cross cultural communication in physical and virtual teams	▪ The Communication Process ▪ Language and Culture ▪ Non Verbal Communication ▪ Barriers to Cross Cultural Understanding	8
4.	Negotiation and Decision Making	▪ Theories of Negotiation ▪ Negotiation and Intercultural Communication ▪ Decision making in cross cultural environment	2
5.	Cross Culture and Leadership	▪ 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, Assignment 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.
6.	Madhavan,S., Cross Cultural Management: Concepts and Cases(2nd Ed),Oxfor University Press 2016.
7.	Coyle,D., The Culture Code: The Secrets of Highly Successful Groups, Bantam, 2018

CO-PO-MAPPING

SEMESTER - V																			BT	CS		ECE		IT	
Course Name & Code	Course Outcome	Cognitive Level	CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PS01	PSO2	PS01	PSO2	PS01	PS01
Technology and Culture(17B1NHS531)	Understand the main theories in cultural management,	C 4	C303-5.1				1		3		2	1	3		3								1	1	
	Identify technological convergence and cultural divergence, relate the differences to the literature and suggest solutions	C 6	C303-5.2				1		2			2	3		3		1			1			1	1	
	Interpret and communicate effectively in physical and virtual teams by choosing appropriate concepts, logic and selecting the apt IT tools.	C5	C303-5.3				1		3		2	2	3		3		1			1			1	1	
	Application of the theoretical knowledge to adapt to cultural differences in global work environment.	C 6	C303-5.4				1		3		3	2	3		3		1			1			1	1	

Technology and Culture																									
SEMESTER - V																			BT	CS		ECE		IT	
Course Name & Code	Course Outcome	Cognitive Level	CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PS01	PSO2	PS01	PSO2	PS01	PS01
Technology and Culture (17B1NHS531)	Understand the main theories in cultural management,	C 4	C303-5.1				1		3		2	1	3		3								1	1	
	Identify technological convergence and	C 6	C303-5.2				1		2			2	3		3		1			1			1	1	

	cultural divergence, relate the differences to the literature and suggest solutions																						
	Interpret and communicate effectively in physical and virtual teams by choosing appropriate concepts, logic	**C5**	**C303-5.3**				**1**		**3**		**2**	**2**	**3**		**3**		**1**			**1**		**1**	**1**	

	and selectin g the apt IT tool s.																						
	Appl icati on of the theo retic al kno wle dge to ada pt to cult ural diffe renc es in glob al wor k envi ron men t.	**C 6**	**C 3 0 3- 5. 4**				**1**		**3**		**3**	**2**	**3**		**3**		**1**			**1**		**1**	**1**	

Lecture-wise Breakup

Course Code	17B1NMA531	**Semester** - Odd	**Semester** V **Session** 2019 - 2020 **Month from** July 2019 - Dec 2020
Course Name	Basic Numerical Methods		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Prof. Sanjeev Sharma and Dr. Pankaj Kumar Srivastava	
	Teacher(s) (Alphabetically)	Dr. Pankaj Kumar Srivastava, Prof. Sanjeev Sharma, 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 and their convergence.	Applying 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	08

		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	
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, 6th Ed., Pearson Education, 1999.
2. **M.K. Jain, S.R.K. Iyengar and R. K. Jain,** Numerical Methods for Scientific and Engineering Computation 6th 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, 3rd Ed., McGraw-Hill, New York, 1980.

Detailed Syllabus
Lecture-wise Breakup

Subject Code	18B12HS311	**Semester ODD**	**Semester** 5 **Session** 2019-20 **Month from** July 2019 to December 2019
Subject Name	STRATEGIC HUMAN RESOURCE MANAGEMENT		
Credits	3	**Contact Hours**	2-1-0
Faculty (Names)	**Coordinator(s)**	Ruchi Gautam (Sec-128), Santoshi Sengupta (Sec-62)	
	Teacher(s) (Alphabetically)	Ruchi Gautam (Sec-128), Santoshi Sengupta (Sec-62)	

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 an organization and design effective strategies for the same	Evaluate Level (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 [Assignments (10) Project (10) Attendance (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.	Tanuja Agarwala, Strategic Human Resource Management, 1st 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
4.	Amberg, J. J., & McGaughey, S. L. (2019). Strategic human resource management and inertia in the corporate entrepreneurship of a multinational enterprise. *The International Journal of Human Resource Management*, *30*(5), 759-793.
5.	Stewart, G. L., & Brown, K. G. (2019). *Human resource management*. Wiley.
6.	Deshati E. Social media, a strategic tool for the recruitment process. J Fin Mark. 2017;1(1):3-4.

Detailed Syllabus
Lecture-wise Breakup

Course Code	**18B12HS612**	**Semester : Odd**	**Semester: V Session: 2019-20** **Month: JULY-DECEMBER**
Course Name	**Indian Polity and Constitutional Democracy in India.**		
Credits	**3**	**Contact Hours**	**(2-1-0)**

Faculty (Names)	**Coordinator(s)**	Dr. Chandrima Chaudhuri
	Teacher(s) (Alphabetically)	Dr. Chandrima Chaudhuri

COURSE OUTCOMES		**COGNITIVE LEVELS**
C303-7.1	Demonstrate an understanding about the current Indian political scenario by knowing about the structure of government in place	Understand(C2)
C303-7.2	Demonstrate an understanding of the role of Indian President, Prime Minister, Governor and other members of the legislature as representatives of the common masses	Understand (C2)
C303-7.3	Analyze the working of Indian federalism with reference to centre-state relations	Analyze(C4)
C303-7.4	Analyze the impact of the contemporary challenges such as caste, gender, regionalism to the working of Indian democracy	Analyze(C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	The Indian Constitution	• Background to the Constitution • Fundamental Rights and Duties • Directive Principles	6
2.	Organs of the Government	• The Executive: President, Prime Minister and Governor- appointment, powers and functions • The Legislature: Parliament and its components- Lok Sabha and Rajya Sabha (composition and functions) • The Judiciary: Supreme Court-composition, functions and jurisdiction	6
3.	Nature of Federalism	• Centre-State Legislative Relations • Centre-State Administrative Relations • Centre-State Financial Relations • Special Provisions of some state and the 5th and 6th schedule	8
4.	Local Governments	• Municipality- Structure & Functions • Panchayat-Organization and Powers	4
4.	Challenges to	• Caste	4

	Indian Democracy	• Gender • Ethnicity • Politics of regionalism	
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (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).*The Constituent Assembly: Microcosm in Action in The Indian Constitution: Cornerstone of a Nation.* New Delhi:Oxford University Press
2.	Awasthi, A. &Awasthi, A.P. (2017). *Indian Administration*. Agra: L.N. Aggarwal Educational Publishing
3.	Basu, D.D. (2018). *Introduction to the Constitution of India*. 23rd Edition. Gurgaon: LexisNexis
4.	Bhargava,R. (2008).*Politics and Ethics of the Indian Constitution*. New Delhi: Oxford University Press
5.	Jha, S. (2008). Rights versus Representation: Defending Minority Interests in the Constituent Assembly, in R. Bhargava. (ed.), *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press
6.	Johari, J.C. (2013). *The Constitution of India: A Politico-Legal Study*. Noida: Sterling Publishers
7.	Kapur, D.& Mehta, P.B. (ed.) (2005)*Public Institutions in India: Performance and Design*, New Delhi: Oxford University Press
8.	Maheshwari, S.R. (2001). *Indian Administration*. Hyderabad: Orient Blackswan
9.	Manor, J. (1994). The Prime Minister and the President, in B.D. Dua, and J. Manor (eds.) *Nehru to the Nineties: The Changing Office of the Prime Minister in India*. Vancouver: University of British Columbia Press
10.	Pylee, M.V. (1962). *India's Constitution*. Bombay: Asia Publishing House
11.	Shankar, B.L., &Rodrigues, V. (2011)*The Indian Parliament: A Democracy at Work*, New Delhi: Oxford University Press
12.	Sharma, B.K. (2002). *Introduction to the Constitution of India*. New Delhi: Prentice Hall of India
13.	Singh, M.P. & Saxena, R. (2008). *Indian Politics: Contemporary Issues and Concerns*. New Delhi: PHI Learning
14.	Singh, M.P. & Roy, H. (2018). *Indian Political System*. 4th Edition. Bengaluru: Pearson Education

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B1NHS434	**Semester** Odd **(specify Odd/Even)**	**Semester** V **Session** 2019 -2020 **Month from** Jan to June 2019
Course Name	Principles of Management		
Credits	**3**	**Contact Hours**	(2-1-0)

Faculty (Names)	**Coordinator(s)**	Ms Puneet Pannu (Sect 62) Dr Deepak Verma (Sect 128)
	Teacher(s) (Alphabetically)	Dr Deepak Verma, Ms Puneet Pannu

COURSE OUTCOMES		**COGNITIVE LEVELS**
C303-1.1	Describe the functions, roles and skills of managers and illustrate how the manager's job is evolving	Understand Level (C2)
C303-1.2	Examine the relevance of the political, legal, ethical, economic and cultural environments in global business.	Analyze Level (C4)
C303-1.3	Evaluate approaches to goal setting, planning and organizing in a variety of circumstances.	Evaluate Level (C5)
C303-1.4	Evaluate contemporary approaches for staffing and leading in an organization.	Evaluate Level (C5)
C303-1.5	Analyze contemporary issues in controlling for measuring organizational performance.	Analyze 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.	6
4.	Directing	Scope, Human Factors, Creativity and Innovation,	5

		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.	
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, 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.	Robbins S.P., Coulter M & Fernandez A, *Management*, Fourteenth Edition, Pearson Education India (2019)
2.	Robbins S.P., Coulter M & DeCenzo D., *Fundamentals of Management*, Ninth Edition, Pearson Education India (2016)
3.	Durai P., *Principles of Management Text and Cases*, Pearson Education India(2015)
4.	Aryasi A.R., *Fundamentals of Management*, McGraw Hill Education (2018)
5.	Stoner J, Freeman R.E & Gilbert D.R.,Management, Sixth Edition, Pearson Education India (2018)
6.	Weihrich H, Cannice M.V.& Koontz H., *Management A Global, Innovative & Entrepreneurial Perspective,* Fourteenth Edition, McGraw Hill Education (2017)

Detailed Syllabus
Lecture-wise Breakup

Subject Code	15B11CI511	**Semester: Odd (specify Odd/Even)**	**Semester 5th Session** 2019-2020 **Month from** JUL'19 **to** DEC'19
Subject Name	Computer Networks		
Credits	4	**Contact Hours**	3-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Gagandeep Kaur (J62), Dr. Sanjeev Patel (J128)
	Teacher(s) (Alphabetically)	J62: Dr. Alka Singhal, Dr. Nisha Chaurasia, Dr. Shilpa Budhkar, Dr. Kavita Pandey J128:Mr. Bansidhar Joshi, Dr. Neeraj Jain, Rupesh K Koshariya

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	Determine the shortest path for the network using various routing protocols and evaluate it.	Evaluating (Level 5)
C310.5	Choose IP & MAC addressing mechanisms and data link layer protocols to solve communication, error detection and correction problems.	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.	7.5
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	5
3.	The Transport Layer	Transport-Layer Services and Principles, Multiplexing and 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 Congestion Control	8.5

4.	The Network Layer	Introduction and Network Service Model, Routing Principles, Hierarchical Routing, IP: the Internet Protocol, Routing in the Internet, Broadcast and multicast routing	11
5.	The Link Layer and Local Area Networks	The Data Link Layer: Introduction, Services, Error Detection and Correction, Multiple Access Protocols and LANs, LAN Addresses and ARP, Ethernet	8.5
6.	Recent Trends in Networks	Introduction to Distributed Systems, Cloud, IoT, FoG SDN etc.	1.5
Total number of Lectures			**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignments-10, Quiz-5, Attendance-10)
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

Detailed Syllabus

Computer Networks Lab (15B17CI571)
Lab-wise Breakup

Subject Code	**15B17CI571**	**Semester** **Odd**	**Semester _V __ Session 2019-20** **Month: from July To Dec 2019**
Subject Name	**Computer Networks Lab (15B17CI571)**		
Credits	**1**	**Contact Hours**	**0-0-2**

Faculty (Names)	**Coordinator(s)**	**Taj Alam, Shilpa Budhkar & Rupesh Kumar Koshariya**
	Teacher(s)	**Nisha Chaurasia, Somya Jain, Sangeeta Mittal, Kavita Pandey , Pawan Singh Mehra, Alka Singhal**

S. No.	DESCRIPTION	COGNITIVE LEVEL(BLOOMS TEXONOMY)
C370.1	Classify all the wired/wireless technologies and the basic network building blocks	Understand Level (Level 2)
C370.2	Visualize and analyze the data packets of different TCP/IP layers. Store the data packets as *.pcap files.	Apply Level (Level 3)
C370.3	Create client and server applications using the "Sockets" and the implementation of various protocols at Data link and TCP layer	Analyze Level (Level 4)
C370.4	Model a communication network and Estimate the delay caused in the network due to congestions and link breakages.	Evaluate Level (Level 5)

Module No.	Subtitle of the Module	Topics in the module	CO
1.	**Introduction**	Introduction to Computer Network devices / UNIX Commands for TCP/IP Protocol	CO1

2.	**Wireshark Simulator**	Practice on WIRESHARK with tcpdump : Application Layer, Transport Layer	CO2
3.	**Socket Programming**	Client server programming using TCP and UDP, Implementing a calculator	CO3
3.	**Network Simulator (NS2)**	Introduction, Implementation of TCP Tahoe and Reno using ns-2, Performance Analysis of TCP Congestion Control Algorithm, Implementation of AQM Algorithm and its performance analysis, and its performance analysis	CO4
4.	**Multicasting/Broadcasting**	Introduction, Multicast vs Broadcast Routing using ns-2, Estimate the delay caused in the network due to congestions and link breakages	CO4
5.	**Modeling a realistic Network**	Simulate and compare different routing algorithms, error detection and correction and buffer management techniques	CO5

Evaluation Criteria

Components	**Maximum Marks**
Lab Test -1	**20**
Lab Test -2	**20**
Lab Evaluations	**30**
Project	**20**
Attendance	**10**
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 F. Kurose, Keith W. Ross, " Computer Networking : A Top-Down Approach Featuring the Internet " 3rd Edition Pearson Education.
2.	Andrew S. Tanenbaum,"Computer Networks" 4th Edition
3.	UNIX Network Programming, Volume 1, Second Edition: Networking APIs: Sockets and XTI, Prentice Hall, 1998, ISBN 0-13-490012-X.
4.	Teerawat Issariyakul, Ekram Hossain, "Introduction to Network Simulator NS2", Springer.
5.	Anish nath, "Packet Analysis with Wireshark Paperback," Packt Publishing
6.	Yoram Orzach, "Network Analysis Using Wireshark Cookbook," Packt Publishing

Detailed Syllabus

Course Code	15B17CI576	**Semester** Odd **(specify Odd/Even)**	**Semester 5th Session** 2019 -2020 Months from July 2019 to December 2019
Course Name	Information Security Lab		
Credits	1	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Amanpreet Kaur
	Teacher(s) (Alphabetically)	Alka Singhal, Arpita Jadhav, Gagandeep Kaur, P Raghu Vamsi, Vikas Hassija

Course Outcomes (CO)	**Description**	**Cognitive Level (Bloom's Taxonomy)**
C374.1	Demonstrate and illustrate the different cipher techniques and understand various anti-virus and anti worms	Level-2 (Understanding Level)
C374.2	Develop and make a code to implement various Symmetric key , Asymmetric key cryptographic techniques and steganography techniques	Level-3 (Applying Level)
C374.3	Apply a client server programming for symmetric ,asymmetric algorithms and key exchange algorithms, Application of information security to real world problems	Level-3 (Applying Level)
C374.4	Examine and analyze the packet information for different protocols using Wireshark.	Level-4 (Analyzing Level)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Cryptography	Introduction to Cryptography	C374.1
2.	Ciphers	Implementation of Cipher using Transposition techniques and Caesar Cipher	C374.2

3.	Ciphers	Implementation of Substitution Ciphers: Hill Cipher and Polyalphabetic Cipher	C374.2
4.	Symmetric key cryptography	Introduction to Symmetric key cryptography	C374.1
5.	Data Encryption Standard	Implementation of Data Encryption Standard (DES)	C374.2
6.	Public key cryptography	Introduction to Public key cryptography and Digital signature	C374.2
7.	Key Exchange Algorithm	Implementation of Diffie Hellman Key Exchange Algorithm	C374.3
8.	Client server programming	Client server programming using TCP	C374.3
9.	Client server programming	Implementation of DES and RSA using Client server programming	C374.3
10.	Steganography	Introduction to Steganography	C374.2
11.	Antivirus and Anti-Worms	Introduction to Antivirus and Anti-Worms, and Wireshark tool	C374.1
12.	Applications of Information Security	Applications of Information Security to real world problems	C374.3
13.	Wireshark	Understanding of Secure-socket layer, Application Layer (HTTP, FTP, DNS) using Wireshark tool	C374.4

Evaluation Criteria

Components	**Maximum Marks**
Lab Test -1	20
Lab Test -2	20
Quiz 1	15
Quiz 2	15
Project	15
Attendance	15
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.	Information Security, Principles and Practice, Mark Stamp, Wiley
2.	Security in Computing 5th Edition , Charles P Fleeger et. al. - Prentice Hall
3.	The InfoSec Handbook: An Introduction to Information Security- Apress Open
4.	Information Security: The Complete Reference, Second Edition- Mark Rhodes Ousley
5.	Cracking Codes with Python: An Introduction to Building and Breaking Ciphers- Al Sweigart

Detailed Syllabus
Lecture-wise Breakup

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**	42

Faculty (Names)	**Coordinator(s)**	Vikas Hassija
	Teacher(s) (Alphabetically)	Vikas Hassija

COURSE OUTCOMES		**COGNITIVE LEVELS**
C313.1	Define all the basic terminologies related to cloud computing and basic nodejs concepts.	Remember Level (Level 1)
C313.2	Write basic nodejs programs for creating server, rendering html, routing, get and post methods.	Understand Level (Level 2)
C313.3	Develop all nodejs programs using nested loops and api methods to restrict post and get requests.	Apply Level (Level 3)
C313.4	Test for the issues in the existing code using debugging tools or other exception handling methods.	Analyze Level (Level 4)
C313.5	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)
C313.6	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	7

		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.	
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, Azure and Dockers	We will explore practically the implementation of web 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.	5
		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	15B28CI581	**Semester V (specify Odd/Even)**	**Semester** V **Session** 2018 - 2019 **Month from July** 2018
Course Name	Cloud based enterprise systems lab		
Credits	1	**Contact Hours**	28

Faculty (Names)	**Coordinator(s)**	Vikas Hassija
	Teacher(s) (Alphabetically)	Vikas Hassija

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.	Hypervisior 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	Install openstack on personal PC	1

	virtualization. Lambda		
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**
Eval 1	15
Lab test 1	20
Eval 2	15
Lab test 2	20
Day 2 Day	30
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

15B28CI582 Multimedia Development Lab

Semester & Session	V Semester 2019-20	Credits	1	Contact Hours L T P	2 0-0-2

Faculty Coordinator(s)	Dr. Niyati Aggrawal
Teaching Methodology	The course will emphasize on hands on experience in the laboratory sessions. A mini project work using the Graphics design Packages (as mentioned above) has to be carried out to ensure integrated learning.
Course Outcomes	At the completion of the course, students will be able to

SLNO	DESCRIPTION	COGNITIVE LEVEL (BLOOMS TAXONOMY)
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)

Module No.	Title of the Module	List of Experiments	CO
1.	visual composition	Create a basic visual composition (GREETING CARD) in Adobe Photoshop	CO1
2.	Pen Tool	Type your name in Font Face - Georgia, Font Size -	CO2

		200 pts. Trace its outline using Adobe Photoshop Pen Tool & its options.	
3.	Color & Tonal Adjustments.	Color & Tonal Adjustments. Try and change the color of the garment in the image with different types of retouching commands. , Colorize gray image	CO2
5.	Pattern Creation	Make a pattern of your own choice in the background using brick wall. Circles, diamond shape, etc.	CO3
6.	Case Study	Creating a retro poster, Creating a open book Icon, Photograph Restoration	CO3
7.	Image Editing	Edit image By using the concept of Canvas size, Copying image, Flipping image, Restoration using cloning, Coloring a selected portion of grey image, De-saturate, Feather, Adding a border, Layer effects, merge the two given images, edit & enhance the given images (images-before) and try to make them similar to the sample enhanced images.	CO2, CO3
10.	Automated Tasks	Use the action Palette (Recording, Saving, Using and Editing actions in the Action Palette)	CO3
11.	Image Masking	Graffiti on Wall. Transparent ball. Use puppet wrap technique to modify a few given images. Use Photo-merge technique to merge a few given images , Create 3D type art , Design and write your own name, Create a realistic loaf of bread	CO2, CO3
12.	Basic Artwork in Illustrator	Importing artwork into Illustrator- Drawing a Pencil Drawing a Snowman in Illustrator, Create the cartoon character in Adobe Illustrator & fill colors.	CO4
13.	Vector Drawing	Convert the given photograph into a Vector image, Building A Building, Create your own globe using different maps, create a Wine Glass, Create Realistic, Vector Bubbles	CO4, CO5
14.	Perspective drawing	One-, two- and three-point perspective drawing	CO4, CO5

Evaluation Criteria

Components	**Maximum Marks**
Evaluation-1	15
Lab Test -1	20
Evaluation-2	15
Lab Test -2	20
Project	20
Attendance	10
Total	**100**

Recommended Reading material:

Multimedia, Photoshop and Illustrator	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.
Additional reading material may be given to the students as and when required.	

Detailed Syllabus

Course Code	15B29CI591	**Semester** Odd **(specify Odd/Even)**	**Semester** V **Session** 2018 -2019 **Month from** Jun to Dec
Course Name	Minor Project (IT)		
Credits	2	**Contact Hours**	0-0-4

Faculty (Names)	**Coordinator(s)**	Dr. K. Vimal Kumar
	Teacher(s) (Alphabetically)	…

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)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	…	…	…
2.	…	…	…
3.	…	…	…
4.	…	…	…
5.	…	…	…
...	…	…	…

n.	…	…	…

Evaluation Criteria

Components	**Maximum Marks**
…	…
…	…
…	…
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.	…
2.	…
3.	…
...	…
m.	…

Detailed Syllabus
Lecture-wise Breakup

Course Code	**16B1NHS531**	**Semester : Odd (specify Odd/Even)**	**Semester : v Session: 2019 - 2020** **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**

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

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 21st 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)
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. *Youth and Society: The long and winding road*, 2nd Ed., Canadian Scholars' Press, Inc. (2008).
2.	White, Rob, Johanna Wyn and Patrizia Albanese. *Youth & Society: Exploring the Social Dynamics of Youth Experience.* Don Mills, ON: Oxford University Press. (2011).
3.	Bansal, P.*Youth in contemporary India: Images of identity and social change*. Springer Science & Business Media. (2012).
4.	Furlong, Andy. *Youth studies: An introduction*. Routledge, (2012).
5.	Blossfeld, Hans-Peter, et al., eds. *Globalization, uncertainty and youth in society: The losers in a globalizing world*. Routledge, (2006).
6.	Ruhela, Satya Pal, ed. Sociology of the teaching profession in India. National Council of Educational Research and Training, (1970).
7.	Frith, S. "The sociology of youth. Themes and perspectives in sociology." Ormskirk, Lancashire: Causeway Books (1984).

Detailed Syllabus
Lecture-wise Breakup

Course Code	16B1NHS532	**Semester:** Odd	**Semester V Session** 2019-2020 **Month from:** July 2019 –Dec 2019
Course Name	Planning and Economic Development		
Credits	03	**Contact Hours**	2-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Amba Agarwal (JIIT-128), Mr. Manas R. Behera (JIIT-62)
	Teacher(s) (Alphabetically)	Dr. Amba Agarwal, 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	Apply the concepts of national income accounting, human development index and sustainable development.	Applying Level (C3)
C303-4.3	Analyze the structural characteristics of the economy.	Analyzing Level (C4)
C303-4.4	Analyze the role of Macroeconomic policies in the development process.	Analyzing Level (C4)
C303-4.5	Assess 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	Physical Quality Life Index, 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	Need for planning-Niti Aayog, Decentralisation, Rural and	3

	Development	Urban local bodies.	
Total number of Lectures			28

Evaluation Criteria

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

Recommended Reading material:

1.	**Todaro, M.P**., **Stephen C. Smith,** Economic Development, Pearson Education, 2017
2.	**Thirwal, A.P**., Economics of Development, Palgrave, 2011
3.	**Ahuja, H. L.**, Development Economics, S Chand publishing, 2016
4.	**Ray, Debraj,** Development Economics, Oxford University Press, 2016