Detailed syllabus
Lecture-wise Breakup

Subject Code	15B1NHS432	**Semester:** ODD	**Semester** III **Session** 2018-2019 **Months:** from July 2018 to December 2018
Subject Name	INTRODUCTION TO PSYCHOLOGY		
Credits	3	**Contact Hours**	2-1-0
Faculty (Names)	**Coordinator(s)**	Dr. Badri Bajaj and Dr. Ruchi Gautam	
	Teacher(s) (Alphabetically)	Dr. Badri Bajaj Dr. Ruchi Gautam	

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C206-6.1	Demonstrate a basic understanding of different perspectives and concepts of psychology	Understanding Level (C2)
C206-6.2	Apply the concepts of psychology in day to day life	Applying Level (C3)
C206-6.3	Examine the different theoretical perspectives and models of psychology	Analyzing Level (C4)
C206-6.4	Develop solutions for problems related to psychology using appropriate tools/models	Creating Level (C6)

Module No.	**Subtitle of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	Introduction to Psychology	Definition, Nature, and Scope of Psychology; Approaches: Biological, Psychodynamic, Behaviorist, and Cognitive. Methods: Experimental, Observation and Case study; Fields of application.	3
2.	Basic Concepts	Person, Consciousness, Behavior and Experience, Perception and learning	5
3.	Memory	Process of Memory: Encoding, Storage, Retrieval; Stages of Memory: Sensory, Short term and Long term	3
4.	Motivation	Motives: Intrinsic and Extrinsic Frame Work, Theories of Motivation; Techniques of Assessment of Motivations; Frustration and Conflict.	3
5.	Emotions	Concept, Development, Expression, Theories of Emotions.	2
6.	Intelligence	Nature, Theories, Measurement and Approaches - Genetic and Environmental	3

7.	Personality	Nature, Approaches, Determinants and Theories; Techniques of Assessment: Psychometric and Projective Techniques.	5
8.	Psychology of Adjustment	Psychological Disorders: Anxiety, Stress, Depression; Psychotherapies.	4
Total number of Lectures			**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment, Quiz, 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.	R.A. Baron and G. Misra, Psychology, 5th Ed., Pearson, 2015
2.	S. Nolen-Hoeksema, B. L. Fredrickson, G. R. Loftus, and C. Luts, Introduction to Psychology, 16th Ed., Cengage Learning, 2014
3.	S. K. Ciccarelli and G. E. Meyer, Psychology, Pearson, 5th Ed., 2017

Detailed Syllabus
Lecture-wise Breakup

Course Code	16B1NHS332	**Semester : ODD (specify Odd/Even)**	**Semester** : III **Session** 2018 -2019 **Month from:** July-December
Course Name	Quantitative Methods for Social Sciences		
Credits	**03**	**Contact Hours**	**2-1-0**

Faculty (Names)	**Coordinator(s)**	Manas Ranjan Behera
	Teacher(s) (Alphabetically)	Manas Ranjan Behera

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C206-3.1	*Demonstrate* the key concepts of different quantitative methods used in social sciences.	Understanding Level- (C2)
C206-3.2	*Classify and summarize the* data to be used for analysis.	Understanding Level- (C2)
C206-3.3	*Apply* the theoretical concept to perform basic data analysis in social sciences.	Apply Level –(C3)
C206-3.4	*Examine* different statistical methods and be able to discuss the merits and limitations of a particular method	Analyze Level –(C4)
C206-3.5	*Recommend* appropriate conclusions following empirical analysis	Evaluation Level- (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction	Introduction to Quantitative Methods, Classification & Presentation of Data: Tabulation-Types of Table, Diagrammatical and Graphical presentation.	3
2.	Mathematical	Mathematical basis of Managerial Decision-Concepts,	3

	Concepts	Frequency Distribution and their Analysis	
3.	Statistical Concepts	Measures of Central Tendency, Measures of Dispersion, Measures of Association, Sampling and sample size estimation, Point estimation, Statistical Intervals based on Single sample.	4
4.	Hypothesis Testing	Hypothesis Testing based on single sample, Inferences based on Two samples, t, Z and chi- square and F tests	8
5.	Regression Analysis	Simple Linear Regression and Correlation, Multiple Regression Model	3
6.	Time Series Analysis	Trend Projection, Moving averages and Exponential smoothing Techniques, Index Numbers	3
7.	Multivariate Analysis	ANOVA, MANOVA, Factor Analysis, Discriminant Analysis	4
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz+ Assignment+Viva-voce)
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.	Sirkin, RM. Statistics for the Social sciences. 3rd ed. Thousand Oaks, Calif: Sage Publications; 2006.
2.	Montgomery, DC. , George C. Runger. Applied statistics and probability for engineers. 3rd ed. Hoboken, NJ: Wiley.,2007
3.	Healey, JF. Statistics: A Tool for Social Research. 9th ed. Calif: Wadsworth Cengage Learning; 2012.

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B1NHS431	**Semester** : Odd	**Semester** III **Session** 2018 -2019 **Month** from July 2018 to Dec 2018
Course Name	Introduction to Literature		
Credits	3	**Contact Hours**	2-1-0
Faculty (Names)	**Coordinator(s)**	Dr. Monali Bhattacharya (Sector 62) Dr. Ekta Srivastava (Sector 128)	
	Teacher(s) (Alphabetically)	Dr. Ekta Srivastava , Dr. Monali Bhattacharya.	

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-5.1	Understand figurative language to demonstrate communication skills individually and in a group	Understand Level (C2)
C206-5.2	Develop a critical appreciation of life and society through a close reading of select texts	Apply Level(C3)
C206-5.3	Analyze a literary text thematically and stylistically and examine it as representing different spectrum of life, human behaviour, and moral consciousness of society.	Analyse Level(C4)
C206-5.4	Interpret Literature as reflection of cultural and moral values of life and society	Evaluate Level(C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Literature & Genres	Introduction Literary Genres Literary Devices	3
2.	Poems	On His Blindness: John Milton Ode to a Grecian Urn: John Keats My Last Duchess: Robert Browning Success is Counted Sweetest: Emily Dickinson A Prayer before Birth: Louis MacNeice Goodbye Party for Miss Pushpa T.S.: Nissim Ezekiel	7
3.	Prose & Short Stories	The Spectator Club: Richard Steele Ultima Thule: John Galsworthy	6

		Toba Tek Singh: Saadat Hasan Manto	
4.	Plays & Drama	Select Soliloquies of Macbeth & Hamlet The Characters of Macbeth, Lady Macbeth & Hamlet as Universal Characters. The Caretaker: Harold Pinter	8
5.	Novel	To Sir With Love: E.R. Braithwaite	4
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Paper/Poster, Presentation , Oral Questions)
Total	**100**

Recommended Reading material:

1	**M.H. Abrams**, *'A Glossary of Literary Terms'*, 7th Edition, Hienle & Hienle: Thomson Learning, USA, 1999
2	**Mark William Roche**, *'Why Literature matters in the 21st Century'*, First Edition, Yale University Press, 2004.
3	**E.R. Braithwaite**, *'To Sir With Live'*, First Edition, Bodley Head, UK, 1959. Susie Thomas(Ed), "E. R. Braithwaite: 'To Sir, with Love' – 1959", Available at http://www.londonfictions.com
4	**Khalid Hasan** (Translator), *'Saadat Hasan Maanto : Toba Tek Singh'* Reprint, Penguin Books, India, 2008.
5	**Harold Pinter**, *'The Caretaker: A Play in Three Acts'*, First Edition, Encore Publishing Co.,London, 1960
6	**Anon,** (n.d.). *The Spectator Club. Sir Richard Steele. 1909-14. English....* [online] Available at: http://www.bartleby.com/27/7.html [Accessed 2018].
7	*All poems online: http://www.poetryfoundation .org*
8	**Wolfgang Clemen**, '*Shakespeare's Soliloquies'*, First Edition, Routledge, London, 1987.

Detailed Syllabus
Lecture-wise Breakup

Course Code	**15B1NHS435**	**Semester Odd (specify Odd/Even)**	**Semester 3rd Session** 2018 -19 **Month from July-Dec**
Course Name	Financial Accounting		
Credits	3	**Contact Hours**	3

Faculty (Names)	**Coordinator(s)**	Dr. Mukta Mani (Sec-62), Dr. Sakshi Varshney (Sec-128)
	Teacher(s) (Alphabetically)	Dr. Mukta Mani, Dr. Sakshi Varshney

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-8.1	Understand the basic concepts of Accounting.	Understanding level (C2)
C206-8.2	Apply accounting concepts for recording of business transactions.	Applying level (C3)
C206-8.3	Compare and reconcile the accounting records with other sources of information	Analyzing level (C4)
C206-8.4	Evaluate the accounting records to identify and rectify the errors made during accounting process.	Evaluating level (C5)
C206-8.5	Construct the final accounts of a business	Creating (C6)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Accounting	Meaning of Accounting, Objectives of Accounting, Understanding Company Management, Stakeholders versus Shareholders, Financial Reporting Standards, Financial Reporting	3
2.	Understanding Accounting Elements	Elements of Financial Statements- Assets, Current assets, Liabilities, Current liabilities, Equity, Income, Expenses, Accounting Equation	4
3.	Accounting Concepts	Business entity concept, Money measurement concept, Going concern, Consistency, Matching concept, Cost concept, Dual aspect concept, Materiality, Full disclosure Generally Accepted Accounting Principles (GAAP)	4
4.	Journal Transactions	Journal, Rules of Debit and Credit, Compound Journal entry, Opening entry	5
5.	Ledger Posting and Trial Balance	Ledger, Posting, relationship between Journal and Ledger, Rules regarding Posting, Trial balance	5
6.	Rectification of Errors	Different types of errors, their effect on trial balance, rectification and preparation of suspense account	3
7.	Bank	Meaning of Bank Reconciliation Statement, technique	2

	Reconciliation Statement	of preparing BRS, Causes of difference	
8.	Final Accounts	Trading account, Profit and Loss account, Balance sheet, Adjustment entries	2
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz + Class test +Class Participation)
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.	**Text Books:** **Maheshwari S. N., Financial and Management Accounting, 5th Ed., S. Chand & Sons Publication, 2014. ISBN No.: 978-81-8054-529-0**
2.	**Reference Book:** **Ghosh, T.P., Financial Accounting for Managers, 4th Ed., Taxmann Publications, 2009**

Detailed Syllabus
Lecture-wise Breakup

Course Code	**15B1NHS433**	**Semester** ODD **(specify Odd/Even)**	**Semester** III **Session** 2018 -2019 **Month from JULY-DEC**
Course Name	**INTRODUCTION TO SOCIOLOGY**		
Credits	**3**	**Contact Hours**	**2-1-0**

Faculty (Names)	**Coordinator(s)**	…
	Teacher(s) (Alphabetically)	…

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-7.1	Explain the major sociological perspectives and methods in the systematic study of society.	Remembering (C1)
C206-7.2	Develop and maximize the idea to explain processes of socialization, social control and how socialization operates in different societies and cultures and concepts of culture and its components (e.g., norms, values).	Understanding(C2)
C206-7.3	Explain the concept of social stratification and types of stratification as class, caste and gender.	Understanding (C2)
C206-7.4	Apply sociological perspective on the origin, development and characteristics of rural and urban societies.	Applying(C3)
C206-7.5	Analyse various social structures in societies and how it shapes and influences social interactions.	Analysing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction	Introduction to sociology and the sociological imagination	2
2.	Basic Concepts of Sociology	Status, Roles, Communities, Interaction, Society and Groups Socialization, Culture, Social Stratification and Deviance	6
3.	Types of Communities	Caste(Sanskritization, Westernization,) ,Class & Tribes, Rural Societies Urban Structures	5
4.	Sociology of Institutions	Kinship, Family ,Religion, Education &Economy in Society	5
5.	Process of Change and Mobility	Modernization, Urbanization, Globalization, Liberalization and Knowledge and Power in Development	4
6.	Sociology of Science	Science, the Environment, and Technology	3
7.	Sociology of Collectivity	Collective Action, Social Movements, and Social Change	3
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25
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.	Anthony Giddens, *Sociology*, 6th Edition, Wiley Publishers 2009
2.	C. Wright. And Mills, *The Sociological Imagination*, Oxford: Oxford University Press, 1959
3.	Peter Berger, *Invitation to Sociology: A Humanistic Perspective* (1963)
4.	Peter L Berger, *The Social Construction of Reality: a Treatise in the Sociology of Knowledge. Garden City,* New York: Anchor. (1966).
5	Conley and Dalton, *You May Ask Yourself: An Introduction to Thinking Like a Sociologist*, 2nd Ed, W. W. Norton & Company New York: (2011) ISBN: 0393935175 or 978-0393935172
6	Ballentine and Roberts, *Our Social World: Introduction to Sociology*, 4th Edition, Sage. 2013
7	Robert Parkin and Linda Stone, (ed.). *Kinship and Family: An Anthropological Reader*, U.S.A.: Blackwell, 2000, selected chapters

Detailed Syllabus
Lecture-wise Breakup

Course Code	16B1NHS333	**Semester :** Odd	**Semester III Session** 2018 -2019 **Month from** July 2018 to Dec 2018
Course Name	Ethics and Corporate Governance		
Credits	3	**Contact Hours**	2-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Monica Chaudhary(JIIT-62), Dr. Amba Agarwal (JIIT-128)
	Teacher(s) (Alphabetically)	Dr. Amba Agarwal, Dr. Monica Chaudhary

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C206-4.1	Apply the basic principle and theories of ethics in different contexts.	Applying Level (C3)
C206-4.2	Understand the various elements of Corporate Governance Structure, Principles and Functions.	Understanding Level (C2)
C206-4.3	Analyze perspectives of different stakeholders on ethical issues	Analyzing Level (C4)
C206-4.4	Illustrate the evolution and development of Corporate Governance in India and globally.	Understanding Level (C2)
C206-4.5	Evaluate the Corporate Governance failures through real life cases.	Evaluating Level (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction	Ethics, Business Ethics, Corporate Governance, Governance through Inner Consciousness and Sustainability. The Role and Responsibility of Business in Society.	4
2.	Ethical Principles in Business	Corporate Governance Structure, Corporate Governance Principles, Corporate Governance Functions, Failure of Governance and its Consequences.	4
3.	Conceptual Framework of Corporate Governance	Introduction, Need and Scope of Corporate Governance in India. Developments in Corporate Governance – A Global Perspective, Elements of Good Corporate Governance.	4
4.	Board of Directors	Role of Board of Directors. Organization Climate & Structure and Ethics. Addressing Ethical Dilemmas. Code of Ethics; Ethics Committee. Case Studies and Contemporary Developments.	4
5.	Board Effectiveness - Issues and Challenges	Board Composition; Diversity in Board Room; Types of Directors; Board's Role and Responsibilities. Relationship between Directors and Executives. Visionary Leadership. Performance Evaluation of Board and Directors.	4
6.	Board Committees	Various Board Committees, their Composition, Role, Responsibilities and Contribution. Audit Committee. Shareholders Grievance Committee. Remuneration Committee. Nomination Committee. Corporate Governance Committee. Corporate Compliance Committee & Other Committees.	3

7.	Legislative Framework of Corporate Governance – An International Perspective	Australia, Singapore, South Africa, United Kingdom, Contemporary Developments in the Global Arena.	3
8.	Corporate Governance and Other Stakeholders	Employees, Customers, Lenders, Vendors, Government and Society.	2
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Presentation & 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.	Zabihollah Rezaee, Corporate Governance and Ethics, First Edition, Wiley, 2008.
2.	Robert A. G. Monks, Nell Minow, Corporate Governance, Fifth Edition, Wiley, 2011.

Detailed Syllabus
Lecture-wise Breakup

Course Code	**18B12HS411**	**Semester :ODD (specify Odd/Even)**	**Semester III Session** Month from July -December
Course Name	**Political Processes in India**		
Credits	**3**	**Contact Hours**	2-1-0

Faculty (Names)	**Coordinator(s)**	…
	Teacher(s) (Alphabetically)	…

CO Codes	**COURSE OUTCOMES**	**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C206-2.1	Explain importance of Constitution and the formation of democratic rights of individual in Indian.	Understanding (C2)
C206-2.2	Understand different modes of political process to understand political system.	Understanding (C2)
C206-2.3	Interpret the working of the constitution	Understanding (C2)
C206-2.4	Explain the institutional formation	Understanding (C2)
C206-2.5	Examine which concepts are most useful for political processes of the country	Analysing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	**Political Parties and the Party System**	National and regional parties. Trends in the party system From the Congress system to the era of multiparty coalitions. The nature of, and challenges to, the electoral system social determinants of voting.	6
2.	**Federalism Regional Aspirations**	Politics of secession, autonomy and accommodation. Centre - state relations; Regionalism Ethnicity Globalizations.	6
3.	**Caste and Politics**	Caste in politics and the politicization of caste. Interaction of caste with class and gender. Caste discrimination and affirmative action policies	4
4.	**Institution Building**	Parliament (Committees and Sub Committees) Election Commission CAG National Human rights commission. The Supreme Court.	12

		Executive's – All India Services	
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25
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.	Arora, B. (2000) 'Negotiating Differences: Federal Coalitions and National Cohesion', in Frankel, F. Hasan, Z. Bhargava, R. and Arora, B. (eds.) *Transforming India: Social and Political Dynamics of Democracy*. New Delhi: Oxford University Press
2.	Jaffrelot, C. (2001) 'The Sangh Parivar Between Sanskritization and Social Engineering', in Hansen, T.B. and Jaffrelot, C. (eds.) *The BJP and the Compulsions of Politics in India.* New Delhi: Oxford University Press
3.	Kothari, R. (2004). 'The Congress "System" in India', in Hasan, Z. (ed.) *Parties and Party Politics in India*, New Delhi: Oxford University Press
4.	Manor, J. 'Regional Parties in Federal Systems', in Arora, B. and Verney, D.V. (eds.) *Multiple Identities in a Single State: Indian Federalism in Comparative Perspective.* Delhi: Konark
5.	Shankar, B.L. & Rodrigues,V. (2005) *The Indian Parliament: A Democracy at Work*, New Delhi: Oxford University Press
6.	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

Detailed Syllabus
Lecture-wise Breakup

Course Code	**16B1NHS331**	**Semester** Odd **(specify Odd/Even)**	**Semester** 3 **Session** 2018 -2019 **Month from** July 2018 to Dec 2018
Course Name	Social and Legal Issues		
Credits	3	**Contact Hours**	**2-1-0**

Faculty (Names)	**Coordinator(s)**	Dr Swati Sharma
	Teacher(s) (Alphabetically)	Dr. Praveen Kumar Sharma, Dr Swati Sharma

CO Code	COURSE OUTCOMES	COGNITIVE LEVELS
C206-1.1	Demonstrate an understanding of social science and business law to individuals and businesses.	Understanding Level (C2)
C206-1.2	Critically evaluate how information technology, contractual agreements, rights and obligations affects business and society	Evaluating Level (C5)
C206-1.3	Analyse legal implications of societal laws.	Analyzing Level (C4)
C206-1.4	Develop acceptable attitudes with respect to ethical cultural and social issues related to technology, system, information	Applying Level (C3)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction	Introduction to Social and Legal Issues	1
2.	Social Structure and Impact	Social Structure Social Impact on Information system and Technology Corporate Social Responsibility	3
3.	Ethics	Business Ethics & Values, Professional Conduct, Code of ethics for an Engineer, Ethics in Bio-Tech.	2
4.	Societal Laws	Introduction to Constitution, Right to information, Consumer Protection Act,	6
5.	Business Laws	Contract Act, Company Act, Negotiable Instruments Acts	8
6.	Intellectual Property & Cyberspace	Intellectual Property Issues:(What is Intellectual Property , Copyright Law, Trademark and Law of Patent	5
7.	Cyber Crime, Laws and IT Act	Computer Crimes(Fraud and Embezzlement, Sabotage & Information Theft, Intruders, Hacking& Cracking), Computer Crime Laws, Digital Forgery, Cyber Terrorism, Wiretapping, IT Act	3
		Total number of Lectures	**28**

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20

End Semester Examination	35
TA	25 (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.	Albuquerque D, Business Ethics Principles and Practices, 1st edition, Oxford University Press,2010
2.	Baase,S, A Gift Of Fire Social, Legal, & Ethical Issues in Computing and Internet,2nd edition Prentice Hall, US, 2006
3.	Diwan,P. & Kapoor,S, Cyber And E-Commerce Laws with information Technology Act, & Rules,2nd edition, Prakesh Publication House,Jaipur , 2000
4	Gogna,P.P.S., A Text book of Business Law, 1st ed, , S Chand & Company LTD.2000
5	Ghosh,B., Ethics in Management and Indian Ethos, 2nd Edition, Vikas Publishing house,New Delhi, 2006

Detailed Syllabus

Lecture-wise Breakup

Course Code	15B11MA301	**Semester** Odd	**Semester** III **Session** 2018 -2019 **Month from** July 2018 to Dec 2018
Course Name	Probability and Random Processes		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Prof. B.P. Chamola, Dr.Pinkey Chauhan	
	Teacher(s) (Alphabetically)	Dr. Amit Srivastava, Prof. B.P. Chamola, Dr.Himanshu Agarwal, Dr. Lakhveer Kaur, Dr. Lokendra Kumar, Dr. Neha Singhal, Dr. Pankaj Srivastava, Dr.Pinkey Chauhan, Dr. Priyanka Sangal, Dr.Puneet Rana, Dr.Yogesh Gupta	

COURSE OUTCOMES:		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C201.1	explain the basic concepts of probability, conditional probability and Bayes' theorem	Understanding Level (C2)
C201.2	identify and explain one and two dimensional random variables along with their distributions and statistical averages	Applying Level (C3)
C201.3	apply some probability distributions to various discrete and continuous problems.	Applying Level (C3)
C201.4	solve the problems related to the component and system reliabilities.	Applying Level (C3)
C201.5	identify the random processes and compute their averages.	Applying Level (C3)
C201.6	solve the problems on Ergodic process, Poisson process and Markov chain.	Applying Level (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Probability	Three basic approaches to probability, conditional probability, total probability theorem, Bayes' theorem.	5
2.	Random Variables	One dimensional random variables (discrete and continuous), distribution of a random variable (density function and cdf). MGF and characteristic function of a random variable and its utility. Bivariate random variable, joint, marginal and conditional distributions, covariance and correlation.	8
3.	Probability Distributions	Bernoulli, binomial, Poisson, negative binomial, geometric distributions. Uniform, exponential, normal, gamma, Earlang and Weibull distributions.	8

4.	Reliability	Concept of reliability, reliability function, hazard rate function, mean time to failure (MTTF). Reliability of series, parallel, series-parallel, parallel-series systems.	6
5.	Random Processes I	Introduction, Statistical description of random processes, Markov processes, processes with independent increments. Average values of random processes. Strict sense and wide sense stationary processes, their averages. Random walk, Wiener process. Semi-random telegraph signal and random telegraph signal process. Properties of autocorrelation function.	7
6.	Random Processes II	Ergodic processes. Power spectral density function and its properties. Poisson processes. Markov chains and their transition probability matrix (TPM).	8
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.	**Veerarajan, T.,** Probability, Statistics and Random Processes, Tata McGraw-Hill, 2002.
2.	**Papoulis, A. & Pillai, S.U.,**Probability, Random Variables and Stochastic Processes, Tata McGraw-Hill, 2002.
3.	**Ross, S. M.,**Introduction to Probability and Statistics for Engineers and Scientists, 4th Ed., Elsevier, 2004.
4.	**Palaniammal, S.,**Probability and Random Processes, PHI Learning Private Limited, 2012.
5.	**Prabha, B. and Sujata, R.,**Statistics, Random Processes and Queuing Theory, 3rd Ed., Scitech, 2009.

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11EC311	**Semester** Odd **(specify Odd/Even)**	**Semester IIIrd Session** 2018 -2019 **Month from July to Dec.**
Course Name	Signal and System		
Credits	**4**	**Contact Hours**	**3+1**

Faculty (Names)	**Coordinator(s)**	Dr. Sajai Vir Singh
	Teacher(s) (Alphabetically)	Dr. Sajai vir singh, Dr. Atul Kumar, Dr. Kuldeep and Mrs. Jyoti Vyas

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Understand the mathematical representation, classification, applications and analyze both continuous and discrete time signals and systems.	Understanding (Level II)
CO2	Analyze and interpret the response of continuous and discrete time LTI system in time domain	Evaluating (Level V)
CO3	Choose and demonstrate the use of different frequency domain transforms to examine and explain the spectral representation of the CT and DT signals and systems.	Evaluating (Level V)
CO4	Apply Laplace and Z transform to analyze and examine the response and behavior of the CT and DT system.	Analyzing (Level IV)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Signals and their classifications	Signal:- definition, Classifications of Signals (Continuous-time & Discrete-time, Analog & Digital, Energy & Power, Deterministic & Random, Periodic & Aperiodic, Even and Odd etc.)	4
2.	System and their classifications	Classifications of Systems Classifications of Systems (Linear & Nonlinear, Time invariant & Time varying, Causal & Non- causal, Memory & Memory less, Stable & unstable system), LTI Systems (continuous-time and discrete time).	5
3.	Response of LTI system	Impulse response of a system, Response of LTI system, Convolution (Integral and Sum).	5
4.	Frequency domain analysis of Continuous time signal and system	Continuous Transforms Fourier series, Convergence of Fourier series, Continuous-time Fourier Transform, properties of Fourier series and Transform, Frequency domain analysis of continuous time LTI system, frequency response of the system	7
5.	Frequency domain analysis of Discrete time signal and system	Discrete Transforms Fourier series, Convergence of Fourier series, Discrete-time Fourier Transform, properties of Discrete-time Fourier series and Transform, Frequency domain analysis of discrete-time LTI system, frequency response of the system	7

6.	Laplace Transform	Laplace Transform, Concept of ROC and Transfer function, pole-Zero plot, properties Laplace Transform, solution of differential equations using Laplace Transform, System function, Laplace approach to analysis the LTI system, stability analysis	7
7.	Z-transform	Z- Transform, Concept of ROC, properties Z- Transform, solution of difference equations using Z- Transform, System function, pole-Zero plot , Z- Transform approach to analysis the Discrete-time LTI system, stability analysis of Discrete-time LTI system	6
8.	Introduction to Digital Filters: FIR & IIR	Digital filters:- definition and frequency response of basic filtering function like BP, HP, LP, BR, AP Definition and representation of IIR and FIR digital filter	1
		Total number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Tutorials/Assignments, Quiz, Attendence)
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.	A.V. Oppenheim, A.S. Willsky & S.H. Nawab, Signals & Systems, 2nd edition ,PHI ,2004
2.	S. Haykin & B. Van Veen, Signals and Systems, 2nd edition, John Wiley & sons, 2004.
3.	M. Mandal, Amir Asif, Continuous and Discrete Time Signals and Systems, Cambridge, 2007
4.	M. J. Roberts, Signals and Systems, Tata Mcraw-Hill, 2003
5.	Tarun Rawat, Signals and Systems, Oxford University Press , 2010
6.	J. G. Proakis & D. G. Manolakis, Digital Signal Processing, Principles, Algorithms and Applications, Fourth edition, PHI, 2007.

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11EC312	**Semester Odd**	**Semester** III **Session** 2018 -2019 **Month from July to December**
Course Name	Digital Electronics		
Credits	4	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Dr. Jitendra Mohan, Dr. Garima Kapur
	Teacher(s) (Alphabetically)	Dr. Archana Pandey, Dr .Bhartendu Chaturvedi, Dr. Garima kapur Dr. Jitendra Mohan, Mr. Atul Kumar Shrivastav, Mr. Ajay Kumar Ms. Deeksha Chandola, Ms. Priyanka Kwatra

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Develop understanding of the fundamental concepts and interpret techniques used in digital electronics which in turn develop a digital logic.	**Applying, Level III**
CO2	Identify basic requirements for a design application (expression) and construct a cost effective solution (minimization)	**Applying, Level III**
CO3	Analyze and construct combinational logic circuits. Compare, simplify and develop digital logic circuits.	**Analyzing, Level IV**
CO4	Analyze and construct sequential logic circuits. Develop skill to troubleshoot digital circuits using Finite state machines.	**Analyzing, Level IV**
CO5	Classify different semiconductor memories and analyze digital system design using PLDs.	**Analyzing, Level IV**
CO6	Evaluate and implement combinational and sequential circuits using HDL systems.	**Evaluating, Level V**

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Digital Systems, Binary Codes and Boolean Algebra	Digital systems, Importance, Analog vs. digital world; Conversion of bases, Representation of negative numbers, 9's and 1's complement, 10's and 2's complement and its arithmetic; Hexadecimal code, weighted codes – BCD,Excess-3 code, Gray code and Alphanumeric code; Logic gates and Boolean algebra	3
2.	Boolean Function Representation and Minimization Techniques	Standard and canonical representation of Boolean Functions, Two level implementation and minimization of Boolean expressions using Karnaugh Map, Prime Implicants, Essential Prime Implicants, Quine-McCluskey method	6
3.	Combinational Logic Circuits and Their Applications	Arithmetic Logic modules- Half adder, Full adder, Half subtractor, Full subtractor, Full adder using half adder, Magnitude Comparators. Parity generator and checker. Decoders, Reducing decoders and Encoders, Multiplexers, Demultiplexers; Look ahead carry adder, Parallel adder/subtractor	10
4.	Sequential Logic Circuits and Their	Latches and flip-flops: SR, JK, Master slave JK, T and D; Excitation tables, Conversion of flip-flops; Synchronous	11

	Applications	and asynchronous counters, Design of counters using flip-flops, Registers, Shift registers, Counters using shift registers; State diagram design, Analysis of sequential circuits using flip-flops; State machine design approach-FSM of sequential circuits (Moore and Mealy machines).	
5.	Programmable Logic Devices	RAMs- DRAM, SRAM and ROM. PLDs: PLAs, PALs and PROMs	3
6.	Digital Logic Families	Introduction to logic families, Parameters of logic families, Types- DTL, RTL, TTL, CMOS	4
7.	Wave Shaping Circuits	IC-555 based Multivibrators	2
8.	Introduction to HDL Simulation	HDL concepts, Simulation using Model Sim, Types of modeling-Data flow, Behavioral and Structural; Combinational and sequential circuit examples	3
		Total number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Attendance : 5 Marks, Quiz:10 Marks, Assignment: 10 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.	M. Morris Mano and Michael D. Ciletti, "Digital Design with an Introduction to the Verilog Hdl," 5th Edition, Pearson Education,2014.
2.	R. P. Jain, "Modern Digital Electronics," 3rd Edition, Tata McGraw-Hill Education, 2003.
3.	A. Anand Kumar, "Fundamentals of Digital Circuits," PHI; 4th Revised edition, 2016.
4.	Ronald J.Tocci, Neal S. Widmar and Gregory L. Moss, "Digital Systems Principles and Applications,"10thEdition,Pearson Education, 2009.
5.	J. Bhaskar, "A VHDL Primer," 3rdEdition, Pearson Education, 2000.

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11EC313	**Semester** …Odd **(specify Odd/Even)**	**Semester** IIIrd **Session** 2018 -2019 **Month from July to Dec**
Course Name	Microprocessor and Microcontroller		
Credits	4	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Smriti Bhatnagar, Vimal K Mishra
	Teacher(s) (Alphabetically)	Mandeep Narula, Neetu Joshi, Ritesh Kumar, Ruby Beniwal, Smriti Bhatnagar

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Recall the basics of digital circuits, specifications and applications.	Remembering (C1)
CO2	Familiarize with the basics of 8 bit, 16 bit and 32 bit microprocessor / Microcontroller, and its internal organization.	Understanding (C2)
CO3	Use the knowledge of different instructions of 8085 microprocessor/ 8051 Microcontroller to write the various programs in assembly language.	Applying (C3)
CO4	Interface the memory chips and peripheral chips, LED, LCD, Keyboard, Motor and Sensors with 8085 microprocessors and Micro controllers.	Analyzing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Digital Electronics & Microprocessor	Digital Circuit Parameters (Open collector outputs, Tristate outputs, I/O source and sink, Fan-in and Fan-out, Propagation delay, Figure of merit), Pipelining & Parallel Processing, Cache Memory, Memory Management, Virtual Memory System, Introduction to Microprocessors, Evolution of Microprocessor, Microprocessor Systems with Bus Organization, Concept of Memory & its internal Organization, Memory Expansion, Classification of Memories & their types.	6L
2.	Detailed Study of Microprocessor 8085	Features of 8085, Microprocessor Architecture in detail, Pin Diagram in detail, De-multiplexing Address & Data Bus, Generation of Control Signals, Interfacing with Memory & I/O Device with timing diagram, Instruction fetching, execution & data transfer operation, Programmer's Model & Instruction Set, Different Formats for Instruction, Opcode & Data, Addressing Modes, Complete Instruction Set (Data transfer, Arithmetic & Logical, Branch & Stack), Assembly language programming, Looping, Counting & Indexing techniques, Interrupt System of 8085, Polling &	15L

		Interrupt, Basic definition of Interrupts, Interrupt Structure & their types, Masking/Unmasking of Interrupts, Interrupt driven I/O, Microprocessor (8086, 80186, 80286, etc.), Architecture Advancement of *Programming Examples*	
3.	Detailed Study of 8051 Microcontroller	Microprocessor Versus Microcontrollers, Microcontrollers for Embedded Systems, Embedded Versus External Memory Devices, CISC Versus RISC Processors, Harvard Versus Von-Neumann architecture, 8051/8031/8052 Microcontroller (Basic architecture, Pin configuration, Memory organization (registers and I/O ports), Assembly language programming (addressing modes and instruction set), Timers and Interrupts, Serial Communication, *Programming Examples.*	12L
4.	Real World Interfacing with Microcontroller	Interfacing of single LED, Blinking of LED with timer and without timer, Interfacing of push-button, LED & 7-segment display, Intelligent LCD Display, Interfacing of intelligent LCD display, Interfacing of Matrix Keyboard to control 7-segment display, Stepper Motor & DC Motor, Interfacing with stepper & DC motor, Relay Interfacing, Different Sensor Interfacing, IR & LDR Sensor, DTMF, 8255 PPI Chip (Pin Configuration, Block Diagram, Operating Modes, Memory Mapped I/O & I/O Mapped I/O), Application of 8255 - 7 segment, Traffic Light Controller etc.	10L
		Total number of Lectures	**43 L**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25
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.	Muhammad Ali Mazidi, "The 8051 microcontroller and Embedded Systems using Assembly and C", 2nd Edition, Pearson Education, 2008.
2.	R. S. Gaonkar, "Microprocessor Architecture Programming & Applications", Prentice Hall, 2002.

Detailed Syllabus
Lab-wise Breakup

Course Code	**15B17EC373**	**Semester: Odd**	**Semester: III[rd] Session** 2018 -2019 **Month from: July-December**
Course Name	**Microprocessors and Microcontrollers lab**		
Credits	1	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Vijay Khare, Abhay Kumar
	Teacher(s) (Alphabetically)	1.Abhay Kumar 2.Bajrang Bansal, 3.B. Suresh 4.Gaurav Verma 5.MandeepNarula6.Neetu Joshi7.Smiriti Bhatnagar 8. Vijay Khare 9.Yogesh Kumar

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Recall the basic of digital electronics and relate its use in microprocessors and microcontrollers.	Remembering (Level I)
CO2	Relate the architecture of Microprocessors and Microcontrollers and its requirements in the area of embedded system with the help of algorithm.	Understanding (Level II)
CO3	Apply the skills and proficiency in the programming to demonstrate the use of instructions in microprocessors and microcontrollers.	Applying (Level III)
CO4	Analyze the use of assemblers, cross compilers and real time hardware to program the microprocessors and microcontrollers and achieve the real time solutions to the problem.	Analyzing (Level IV)

Module No.	**Title of the Module**	**Name of Experiments**	**CO**
1.	8085 Microprocessors	Introduction to the Lab, 8085 architecture and instruction set.	1
2.	8085 Microprocessors	To perform addition of two 8-bit & 16-bit numbers using 8085 microprocessor.	2
3.	8085 Microprocessors	To perform subtraction of two 8-bit & 16-bit numbers using 8085 microprocessor.	2
4.	8085 Microprocessors	To perform multiplication & division of two 8-bit numbers using 8085 microprocessor.	2
5.	8085 Microprocessors	To find out the smallest & largest number in an array of 'N' 8-bit numbers using 8085 microprocessor.	3
6.	8085 Microprocessors	To find the factorial of any 8-bit number using 8085 microprocessor.	3
7.	8051 Microcontrollers	Introduction to 8051, architecture, Kiel and its programming.	4
8.	8051 Microcontrollers	Data transfer and branch instruction in 8051.	4
9.	8051 Microcontrollers	I/O port programming and other memory operations.	4
10.	8051 Microcontrollers	Introduction to 8051 development kit, basic of onboard peripheral (e.g. switch, LED, motor interfacing module, LCD etc).	4
11.	8051 Microcontrollers	LED and Switch interfacing with 8051	4
12.	8051 Microcontrollers	Motor interfacing with 8051	4
13.	Microcontrollers(Virtual Lab)	Design and Simulate microcontroller based design to display "WELCOME JIIT" and addition of two numbers on LCD.	4

14.	Microcontrollers(Virtual Lab)	Design and Simulate microcontroller based design to show the serial communication between microcontroller and PC.	4

Evaluation Criteria

Components	**Maximum Marks**
MID TERM	20
END TERM	20
D2D	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.	Muhammad Ali Mazidi, "The 8051 microcontroller and Embedded Systems using Assembly and C", 2nd Edition, Pearson Education, 2008.
2.	R. S. Gaonkar, "Microprocessor Architecture Programming & Applications", Prentice Hall, 2002.

Detailed Syllabus
Lab-wise Breakup

Course Code	15B17EC371	**Semester** Odd **(specify Odd/Even)**	**Semester** 3rd **Session** 2018 -2019 **Month from** July- December
Course Name	Signal and Systems Lab		
Credits	1	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Dr. Kuldeep Baderia, Dr. Ekta Goel
	Teacher(s) (Alphabetically)	Dr. Alok Joshi, Dr. Atul Kumar, Jyoti Vyas, Dr. Kapil Dev Tyagi, Dr. Sajai Vir Singh

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Understanding of MATLAB and its various applications, Classification of continuous time signals and discrete time signals.	Understanding (Level II)
CO2	Apply the coding skills of MATLAB for Convolution of continuous time signals and discrete time signals, for DFT and IDFT.	Applying (Level III)
CO3	Analyze different LTI systems with Frequency domain representation of continuous time and discrete time periodic and aperiodic signals.	Analyzing (Level IV)
CO4	Determine Laplace Transform of continuous time signals and Z-Transform of discrete time signals. Introduction to SIMULINK and to realize systems described by differential and difference equations	Evaluating (Level)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Basics of MATLAB	Introduction to MATLAB and its various applications.	CO1
2.	Continuous Time Signals	Introduction to continuous time signals.	CO1
3.	Discrete time signals	Introduction to Discrete time signals.	CO1
4.	Even and Odd Signals	Introduction to even and odd parts of signal.	CO1
5.	Operations on Signals	Write MATLAB Codes for generating and plotting various combinations of the two signals and perform time scaling, time shifting, time reversal and multiple transformations.	CO1
6.	Energy and power of signals	Write MATLAB codes for finding the Signal Energy or power of signals.	CO1
7.	Convolution sum	To calculate the of two discrete time signals.	CO2
8.	Convolution integral	To calculate the convolution integral of two continuous - time signals.	CO2
9.	LTI System	Realization of LTI system and verify it.	CO3

10.	Fourier Series	Determine frequency domain representation of CT and DT periodic signals.	CO3
11.	Fourier Transform	Determine frequency domain representation of CT and DT aperiodic signals.	CO3
12.	Discrete Fourier Transform	Write your own MATLAB function to compute DFT (Discrete Fourier Transform) and IDFT (Inverse Discrete Fourier Transform) for the spectral analysis of signals.	CO3
13.	Laplace Transform	Find out output y (t) of the system where input is x (t) and impulse response is h (t) using Laplace Transform. Also, find the ROC of the transform.	CO4
14.	Z-Transform	Find out output y [n] of the system where input is x[n] and impulse response is h[n] using Z-Transform. Also, find the ROC of the transform. Verify answer using MATLAB commands „ztrans" and „iztrans". Check stability of the system using MATLAB	CO4
15.	SIMULINK	Introduction to SIMULINK and to realize systems described by differential and difference equations.	CO4
16.	Virtual Lab on Signals	Virtual Lab: 1. Signals and its properties	CO1
17.	Virtual Lab on Systems	Virtual Lab: 2. System and their properties	CO2
18.	Virtual Lab on Fourier Analysis	Virtual Lab: 3. Fourier analysis of signals	CO3

Evaluation Criteria

Components	**Maximum Marks**
V1	20
V2	20
AC	40
Attendance	10
Virtual Lab Exp	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.	J.G.Proakis and D. G. Manolakis, Digital Signal Processing: Principles, Algorithms, and Applications, Third Edition, PrenticeHall, 1999.
2.	A.V.Oppenheim and R.W. Schafer, Discrete-Time Signal Processing, Second Edition, Prentice Hall, 1999.
3.	Sanjit K. Mitra, Digital Signal Processing: With DSP Laboratory Using MATLAB : A Computer-Based Approach, Second Revised Edition, TMH, 2001.

Detailed Syllabus
Lab-wise Breakup

Course Code	**15B17EC372**	**Semester - Odd (specify Odd/Even)**	**Semester:** 3rd, **Session:** 2018 -2019 **Month from:** July, 2018 to December, 2018
Course Name	Digital Electronics Lab		
Credits	**1**	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Dr. Bhartendu Chaturvedi , Dr. Ajay Kumar
	Teacher(s) (Alphabetically)	Dr. Archana Pandey, Mr. Atul Kumar Srivastava, Dr. Bhagirath Sahu, Dr. Jasmine Saini, Dr. Jitendra Mohan, Dr. Kirmender Kingh, Ms. Priyanka Kwatra, Dr. Shamim Akhter, Dr. Shruti Kalra, Mr. Vinay Anand Tikkiwal.

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Learn the nomenclature of Digital ICs, familiarize and verify the truth tables of logic gates using ICs.	Applying (Level III)
CO2	Analyze, construct and verify various combinational circuits and their functionalities.	Analyzing (Level IV)
CO3	Identify basic requirements to analyze, construct and verify sequential circuits.	Analyzing (Level IV)
CO4	Utilize VHDL to implement and simulate combinational and sequential logic circuits.	Applying (Level III)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Introduction of Logic Gates ICs	Introduction to Digital Electronics Lab: Nomenclature of Digital ICs, specifications, study of the data sheet, concept of V_{CC} and ground, verification of the truth tables of logic gates using ICs.	1
2.	Construction and Verification of Logic Gates	(a) To implement basic logic gates AND, OR, NOT using NAND and NOR gates. (b) To implement Ex-OR gate using NOR gates only. (c) To implement the Boolean expression(s) using NAND gates.	1
3.	Analysis and verification of Combinational circuits	To design 4 bit Binary to Gray and Gray to Binary Code Converter.	2
4.	Analysis and verification of Combinational circuits	To realize a Half Adder, Full Adder and Half Subtractor using logic gates.	2
5.	Analysis and verification of Combinational circuits	To design a 2-bit Multiplier using basic logic gates.	2
6.	Analysis and verification of Combinational circuits	To realize and implement 2-bit Magnitude Comparator using logic gates.	2
7.	Analysis and verification of Combinational circuits	To realize 4:1 Multiplexer using NAND gates.	2
8.	Analysis and verification of Combinational circuits	To realize 2:4 Decoder using basic logic gates and to realize Half Adder using 2:4 Decoder as a block.	2

9.	Analysis and verification of Combinational circuits	Display decimal digit between 0-9 on seven segment using BCD Decoder IC-7447.	2
10.	Analysis and verification of Sequential circuits	To realize and verify the truth table of SR, Gated SR, Gated D Latch using logic gates and of JK flip flop using IC-74LS76.	3
11.*	Analysis and verification of Sequential circuits	To design a Ripple Counter (Asynchronous) using JK flip flop IC-74LS76 and display the output on seven segment.	3
12.*	Analysis and verification of Sequential circuits	Design and implement counting sequence 0, 7, 1, 6, 2, 5, 0, 7…. (Repeating) using IC-74LS76.	3
13.*	Analysis and verification of Sequential circuits	Using IC-555 in Astable mode to generate a rectangular pulse of 1ms period with duty cycle 75%.	3
14.*	Analysis and verification of Sequential circuits	Draw the transfer characteristic of TTL based NOT gate.	3
15.*	Implementation and simulation of Logic circuits using VHDL	(a) Write the VHDL program for the following logic circuits: Half Adder, Full Adder, 2X1 Multiplexers, 2:4 Decoder. (b) Write VHDL program for D, JK, T and RS flip flops.	4

Evaluation Criteria

Components	**Maximum Marks**
Viva 1	**20**
Viva 2	**20**
DTD	**60**
Total	**100**

*** These are advanced level experiments.**

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.	M. Morris Mano and Michael D. Ciletti, "Digital Design with an Introduction to the Verilog Hdl," 5th Edition, Pearson Education,2014.
2.	R. P. Jain, "Modern Digital Electronics," 3rd Edition, Tata McGraw-Hill Education, 2003.
3.	J. Bhaskar, "A VHDL Primer," 3rdEdition, Pearson Education, 2000.

Detailed Syllabus
Lab-wise Breakup

Course Code	15B17EC375	**Semester ODD (specify Odd/Even)**	**Semester** III, **Session** 2018 -2019 **Month from** July to Dec.
Course Name	Electrical Machine and Instruments LAB		
Credits	**1**	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Ritesh Kr Sharma
	Teacher(s) (Alphabetically)	Ankur Bharadwaj, Neetu Joshi, Ritesh Sharma, Ruby Beniwal, Shivaji Tyagi

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Determine different parameters of a transformer using short circuit and open circuit test. Demonstrate displacement measurement Using LVDT	Understanding (Level II)
CO2	Recall Wheat-stone Bridge method for the measurement of unknown resistance. Find out Frequency and phase using Lissajous Patterns.	Remembering (Level I)
CO3	Measure the unknown resistance, inductance and capacitance using different bridge networks	Applying (Level III)
CO4	Determine the Induction Motor parameters using No Load and Block Rotor Test	Applying (Level III)
CO5	Plot and Analyze open circuit characteristics of Self and Separately Excited DC generators. Determine polarity and turn ratio of a single phase transformer.	Analyzing (Level IV)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Transformers	To perform Open circuit test on a single phase transformer to determine equivalent circuit (Shunt) parameters	1
2.	Transformers	To perform Open circuit test on a single phase transformer to determine equivalent circuit(Series) parameters	1
3.	Transformers	Measurement of displacement using LVDT.	1
4.	Bridges	Determination of unknown resistance using Wheat stone Bridge.	2
5.	Electrical Instruments	Measurement of phase and frequency using CRO (Lissajous Pattern).	2
6.	DC Machines	To find relation between open circuit voltage and field current of a self excited DC generator. Plot the open circuit characteristics	5
7.	Induction Motor	To perform No load and block rotor test on a three phase induction motor and hence determine equivalent circuit parameters	4
8.	DC Machines	To find relation between open circuit voltage and field current of a separately excited D C generator. Plot the open circuit characteristics	5
9.	Transformers	To find the polarity and turn ratio of a single phase transformer	5

10.	Bridges	Measurement of unknown resistance and Inductance using Maxwell's Bridge	3
11.	Bridges	Measurement of unknown resistance and Inductance using Hay's Bridge	3
12.	Bridges	Measurement of unknown capacitance using De-Sauty and Schering Bridge	3
13.	Bridges	Measurement of unknown resistance and Inductance using Anderson's Bridge	3

Evaluation Criteria

Components	**Maximum Marks**
Mid Sem. Viva	20
End Sem. Viva	20
Day to Day Work (Including LAB Record and Attendance)	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.	A.E. Fitzgerald, C. Kingsley Jr. and At. D. Umans, "Electric Machinery**",** Fifth edition, McGraw- Hill.
2.	Helfrick and Cooper**, "**Modern Electronic Instrumentation and Measurement Techniques**" ,** second edition, PHI.