Kurukshetra University, Kurukshetra

(Established by the State Legislature Act-XII of 1956)

("A++" Grade, NAAC Accredited)

Syllabus
for
Post Graduate Programme

M.Sc. Statistics (IInd Semester)
as per NEP 2020

Curriculum and Credit Framework for Postgraduate Programme

With Multiple Entry-Exit, Internship and CBCS-LOCF

With effect from the session 2024-25

DEPARTMENT OF STATISTICS AND OPERATIONAL RESEARCH

FACULTY OF SCIENCES

KURUKSHETRA UNIVERSITY, KURUKSHETRA -136119

HARYANA, INDIA

<table>
<tr><td colspan="4" align="center">Session: 2024-25</td></tr>
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<tr><td colspan="2">Name of Programme</td><td colspan="2" align="center">M.Sc. Statistics</td></tr>
<tr><td colspan="2">Semester</td><td colspan="2" align="center">Second</td></tr>
<tr><td colspan="2">Name of the Course</td><td colspan="2" align="center">Stochastic Processes</td></tr>
<tr><td colspan="2">Course Code</td><td colspan="2" align="center">M24-STA-201</td></tr>
<tr><td colspan="2">Course Type</td><td colspan="2" align="center">CC-5</td></tr>
<tr><td colspan="2">Level of the course</td><td colspan="2" align="center">400-499</td></tr>
<tr><td colspan="2">Pre-requisite for the course (if any)</td><td colspan="2"></td></tr>
<tr><td colspan="2">Course Learning Outcomes (CLO)
After completing this course, the learner will be able to:</td><td colspan="2">
• CLO 201.1: Understand the concept of stochastic processes and their classifications.
• CLO 201.2: Deal with Random walk models.
• CLO 201.3: Classify states and Markov chains according to their long term behavior.
• CLO 201.4: Derive the probabilities for the birth, death and Polya processes.
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<tr><td colspan="2">Credits</td><td align="center">Theory</td><td align="center">Practical</td><td align="center">Total</td></tr>
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Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

<div align="center">Part B-Contents of the Course</div>

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Introduction to Stochastic processes, Classification of Stochastic processes according to state, space and time domain. Generating function, Convolutions, Compound distribution, Partial fraction expansion of generating functions.	15
II	Recurrent events, recurrence time distribution: necessary and sufficient condition for persistent and transient recurrent events & its illustrations and Notion of delayed recurrent event. Random walk models: absorbing, reflecting and elastic barriers, Gambler's ruin problem, probability distribution of ruin at nth trial.	15
III	Markov chains: transition probabilities, classification of states and chains, evaluation of the nth power of its transition probability matrix. Discrete branching processes, chance of extinction, means and variance of the nth generation.	15

IV	Notions of Markov processes in continuous time and Chapman-Kolmogorov equations. The Poisson process: The simple birth process, the simple death processes. The simple birth and death process: The effect of immigration on birth and death process. The Polya Processes: Simple non-homogeneous birth and death processes.	15
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:
1. Bailey, N.T (1966) : The Elements of Stochastic Processes, John Wiley & Sons
2. Medhi , J (2010)   : Stochastic Processes, New Age International (P) Limited.
3. Karlin , S.(1997)   : Introduction to Stochastic Processing, Vol. I, Academic Press.
4. Basu, A.K.(2017)   : Introduction to Stochastic Process, Narosa Publishing House.

Session: 2024-25			
Part A - Introduction			
Name of Programme	M.Sc. Statistics		
Semester	**Second**		
Name of the Course	Industrial Operations Research		
Course Code	M24- STA -202		
Course Type	CC-6		
Level of the course	400-499		
Pre-requisite for the course (if any)			
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	• CLO 202.1: Formulate Linear Programming problems and obtain optimum solution. • CLO 202.2:Apply systematic approaches to solve transportation and assignment problems, and analyse decision making. • CLO 202.3: Understand the concept of Game Theory, CPM and PERT. • CLO 202.4: Solve the Inventory and Queuing models		
Credits	Theory	Tutorial	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Convex sets, Linear Programming problems (LPP): Formulation, examples and forms, Hyperplane, Open and Closed half spaces. Feasible, basic feasible and optimal solutions. Solution of LPP by Graphical and Simplex method. Duality in linear programming.	15
II	Transportation Problems- Initial Basic Feasible Solution by North-West Corner Rule, Row minima method, Column minima method, Lowest Cost Entry Method, Vogel's Approximation Method, Optimum Solution of Transportation Problems. Assignment problem and its solution. Decision Theory: Algorithm for decision based problems, Types of decision making, Decision making under uncertainty: Criterion of optimism, Criterion of pessimism and Hurwicz criterion. Decision making under risks: EMV and EOL.	15

III	Game Theory : Terminology , two person zero sum game; game of pure strategy , reducing game by dominance, solution of game of mixed strategy without saddle point using linear programming method. Replacement models: replacement of items whose efficiency deteriorates with time and (i) The value of the money remains same during the period (ii) The value of the money also changes with time. Criterion of present value for comparing replacement alternatives.CPM (Critical path method) to solve the network problems and PERT.	15
IV	Inventory models: Deterministic inventory models (D.I.M) without shortages: EOQ model with constant rate of Demand, EOQ model with different rate of Demand, EOQ with finite rate of replenishment. D.I.M. with shortages : E O Q model with constant rate of Demand and scheduling time constant, E O Q model with constant rate of Demand and scheduling time variable. Queuing models: Introduction of queuing models, steady state solution of M/M/1, M/M/1/N, M/M/C and M/M/C/N and their measures of effectiveness.	15
Total Contact Hours		60

Suggested Evaluation Methods

Internal Assessment: 30		End Term Examination: 70	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			

Recommended Books/e-resources/LMS:
1. Hadley, G.(1997)   : Linear Programming, Narosa Publications House.
2. Churchman, C.W.(1965)   : Introduction to Operations Research John Wiley& Sons, NewYork.
3. Taha, H.A. (2017)   : Operations Research: An Introduction, Pearson.
4. Fillier F.S., Lieberman G.J.,
   Nag B. & Basu P. (2021)   : Introduction to Operations Research, McGraw Hill
5. Sharma, S.D.(2012)   : Operations Research: Theory, Methods & Applications, KNRN.

Session: 2024-25	
Part A - Introduction	
Name of the Programme	M.Sc. Statistics
Semester	**Second**
Name of the Course	Testing of Hypothesis
Course Code	M24-STA-203
Course Type	CC-7
Level of the course (As per Annexure-I	400-499
Pre-requisite for the course (if any)	
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	• CLO 203.1: Understand the elements of Statistical decision theory. • CLO203.2: Know the concepts of Likelihood ratio test and its applications. • CLO203.3: Identify applications where nonparametric approaches are appropriate. • CLO 203.4: Perform and interpret various nonparametric tests.

Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Elements of Statistical decision theory. Neyman - Pearson lemma (with emphasis on the motivation of theory of testing of hypothesis) BCR and sufficient statistics. Testing a simple hypothesis against a class of alternatives. Most powerful test, uniformly most powerful test and sufficient statistics, power function. One and two sided tests. Bhattacharya Bounds, Uniqueness of minimum variance estimators, efficiency, Minimum mean- square estimation.	15
II	Composite hypotheses, An optimum property of sufficient statistics. Similar regions, Elementary ideas of complete statistics, Completeness of sufficient statistics. Likelihood ratio test and its applications, asymptotic distribution of LR statistic and asymptotic power of LR tests. Sequential Analysis. Concept of ASN and OC functions. Wald's sequential probability ratio test and its OC and ASN functions.	15

III	Non - parametric tests and their applications: Empirical distribution function and its properties (without Proof), Test of randomness (Test based on the total number of runs). One- sample and paired-sample techniques: The Ordinary Sign test and Wilcoxon Signed-rank test. Tests of Goodness of Fit: Chi-square Goodness of Fit, The Empirical distribution function, Kolmogrov-Smirnov tests, Independence in Bivariate sample: Kendall's Tau coefficient and Spearman's rank correlation.	15
IV	Generalized two-sample problem: The Wald-Wolfowitz Runs test, Kolmogrov-Smirnov two sample Test, Median Test, Mann-Whitney U Test, Linear Ranked tests for the Location and Scale problem: Wilcoxon Test, Mood Test, Siegel-Tukey Test, Klotz Normal-scores Test, Sukhatme Test. Kruskal Wallis ANOVA test, Concept of Jackknife, Bootstrap methods.	15
	Total Contact Hours	60

Suggested Evaluation Methods

Internal Assessment: 30		End Term Examination: 70	
➢ **Theory**	**30**	➢ **Theory**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Kendall and Stuart (1967) : Advanced Theory of Statistics Vol.-II, Charles Griffin & Co. Ltd, London.

2. Rohtagi,V.K., Saleh Md. Ehsanes,A.K. (2015) : An Introduction to probability and Statistics, John Wiley & Sons.

3. Wald, A (2013) : Sequential Analysis Dover Publications, INC. New York.

4. Gibbons, Jean Dickinson, Subhabrata Chakraborti (2010) : Nonparametric Statistical Inference, CRC Press.

5. Rao, C.R.(1970) : Advanced Statistical Methods in Biometric Research, John Wiley & Sons, INC, New York.

Session: 2024-25	
Part A - Introduction	
Name of Programme	M.Sc. Statistics
Semester	**Second**
Name of the Course	Programming with C and R
Course Code	M24- STA -204
Course Type	CC-8
Level of the course	400-499
Pre-requisite for the course (if any)	
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	• CLO 204.1: Understand the basics of C programming. • CLO 204.2: Understand and apply the concepts of pointers, arrays, structures and unions of C programming. • CLO204.3: Understand the basics of R programming. • CLO204.4: Handle data manipulations and various statistical models with R programming.

Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course		

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Overview of C: Introduction and Importance of C, Structure of a C Program. Elements of C: Character set, identifiers and keywords, Data types, Constants and Variables. Operators and their hierarchy & associativity. Input/output in C. Control statements: Sequencing, Selection: if and switch statement; alternation, Repetition: for, while, and do-while loop; break, continue, go to statement. Functions: Definition, prototype, passing parameters, recursion.	15
II	Storage classes in C: auto, extern, register and static storage class, their scope, storage and lifetime. Arrays: Definition, types, initialization, processing an array, passing arrays to functions. Pointers: Declaration, operations on pointers, use of pointers. String handling functions Structure & Union: Definition, processing, Structure and pointers, passing structures to functions. Data files: Opening and closing a file, I/O operations on files.	15

III	Introduction to R: Overview of R programming, Evolution of R, Applications of R programming, Basic syntax; Basic Concepts of R: Reserved Words, Variables & Constants, Operators, Operator Precedence, Data Types, Input and Output; Data structures in R: Vectors, Matrix, List in R programming, Data Frame, Factor. Control flow: If...else, If else() Function, For loop, While Loop, Break & next, Repeat Loop; Functions: R Functions, Function Return Value, Environment & Scope, R Recursive Function, R Infix Operator, R Switch function; Strings: String construction rules, String Manipulation functions.	15
IV	R packages: Study of different packages in R; R Data Reshaping: Joining Columns and Rows in a Data Frame, Concept of List, Merging Data Frames, Melting and Casting; Working with files: Read and writing into different types of files. R object and Class Object and Class: R S3 Class, R S4 Class, R Reference Class, R Inheritance; Data visualization in R and Data Management: Bar Chart, Dot Plot, Scatter Plot (3D), Spinning Scatter Plots, Pie Chart, Histogram, Box plot, Plotting with Base and Lattice Graphics, Sorting Datasets, Merging Datasets; Statistical modelling and Databases in R: Mean, median, mode, Linear regression, Decision tree, K-means Clustering.	15
	Total Contact hours	60

Suggested Evaluation Methods

Internal Assessment: 30		End Term Examination: 70	
➤ **Theory**	**30**	➤ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc,:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Gottfried, B.S. (1996) : Programming with C, Tata McGraw Hill.

2. Balagurusamy, E. (2004) : Programming in ANSI C, McGraw-Hill.

3. Yashwant, K (2002) :Let us C, BPB.

4. Paradis, E. (2005): R for Beginners

5. Seefeld, Kim & Linder, Ernst (2007) :Statistics using R with Biological Examples

6. Norman M. (2011) : The Art of R Programming-a tour of statistical software design, No Starch Press.

7. Paul Teetor (2011) : R Cookbook Proven Recipes for Data Analysis, Statistics, and Graphics (O'Reilly Cook books)

8. Jeri R. H & Elliot P. K (2013) : Problem Solving and Program Design in C, Addison Wesley.

9. Kabacoff, Rob (2011) : R in Action Book, Manning.

10.Zumel N., Mount J., & Porzak J. (2014) : Practical Data Science with R, Manning.

11.Richard C. (2013) Learning R : A Step-by-Step Function Guide to Data Analysis, "O'Reilly Media, Inc".

Session: 2024-25			
Part A - Introduction			
Name of the Programme	M.Sc. Statistics		
Semester	**Second**		
Name of the Course	Practical-2 (based on C & R)		
Course Code	M24- STA -205		
Course Type	PC-2		
Level of the course	400-499		
Pre-requisite for the course (if any)			
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	• CLO 205.1: Calculate measures of location, dispersion, Skewness and Kurtosis. • CLO 205.2: Plot graphs: Bar Chart, Dot Plot, Scatter Plot, Pie Chart, Histogram and Box plot. • CLO 205.3: Compute correlation and regression, and test of significance. • CLO 205.4: Demonstrate the ability to fit and evaluate probability distributions (Binomial, Poisson, and Normal).		
Credits	Theory	Practical	Total
	0	4	4
Teaching Hours per week	0	8	8
Internal Assessment Marks	0	30	30
End Term Exam Marks	0	70	70
Max. Marks	0	100	100
Examination Time	0	4 hours	
Part B-Contents of the Course			

	Contact Hours 120
Note: There will be 4 questions, the candidate will be required to attempt any 3 questions **Practicals** 1. Finding the mean and standard deviation for discrete and continuous data. 2. Computation of Moments, Skewness and Kurtosis of given data. 3. Computation of Karl Pearson's, Partial & Multiple correlation coefficient and Spearman's rank correlation coefficient. 4. Curve fitting, fitting of lines of regression. 5. Fitting of distribution: Binomial, Poisson and Normal. 6. Testing the significance of the mean of a random sample from a normal population. 7. Testing the significance of difference between two sample means, 8. Testing the significance of an observed correlation coefficient. 9. Testing the significance of an observed partial correlation coefficient. 10. Testing the significance of an observed multiple correlation coefficient. 11. Testing the significance of an observed regression coefficient. 12. Testing the significance of the ratio of two independent population variances. 13. To test the goodness of fit. 14. To test if the hypothetical value of the population variance is $\sigma^2 = \sigma_0^2$ (say).	

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			

CHM

Session: 2024-25

Part A - Introduction

Name of the Programme	
Semester	2nd
Name of the Course	Constitutional, Human & Moral Values and IPRs
Course Code	M24-CHM-201
CourseType	CHM
Level of the course (As per Annexure-I	400-499
Pre-requisite for the course (if any)	-
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO-1. Learn the need, nature and significance of the different Constitutional Values enshrined in our Law of the Land. CLO-2 Understand the need, nature and significance of the different Human Values required to be a good Human Being. CLO-3 Grasp the need, nature and significance of the Moral Values and Professional Conduct required to be fit to become a part of the civil society and to develop a strong sense of integrity. CLO-4 Acquaint with the need, nature, kinds and significance o f IPRs and the remedies required to protect the same in order to develop a sense of respect to the IPRs of individuals.

Credits	Theory	Practical	Total
	2	0	2
Teaching Hours per week	2	0	2
Internal Assessment Marks	15	0	15
End Term Exam Marks	35	0	35
Max. Marks	50	0	50
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours

I	**Constitutional Values:** Historical Perspective of Indian Constitution: Cultural Ethos and Idealism of National Movement; Basic Values enshrined in the Preamble; Concept of Constitutional Morality; Patriotic Values and Ingredients Nation Building; Scheme of Fundamental Rights and the Idea of Human Rights; Directive Principles of the State Policy; Scheme of Fundamental Duties and the Idea of Good Citizenship		7
II	**Human Values:** Humanism, Human Virtues and Civic Sense: Duties and Rights; Social Responsibilities of Human Beings; Respect for Others and Living Peacefully with Others: Guiding Values; Basic Human Aspirations and Way to fulfill it; Living Harmoniously with Others; Idea of International Peace and Brotherhood; Living Harmoniously with the Nature		8
III	**Moral Values and Professional Conduct** Understanding Morality and Moral Values; Moral Education and Character Building: Fighting the Five Capital Evils; Ethics of Relations: Personal, Social and Professional; Moral Dilemmas and Sexual Relations; Gendered Practices/Issues and Need of Gender Sensitization; Issues relating to the Weaker Sections (SCs, STs, OBCs & DAs) and Need of Affirmative Action; Challenges of Ethical Conduct in HIEs; Ethical Leadership: Scope for Students; Business and Corporate Ethics; Engineering Ethics; Ethics of Social Media		8
IV	**Intellectual Property Rights:** Meaning, Origins and Nature of Intellectual Property Rights (IPRs); International Instruments: TRIPS Agreement (1994) and WTO; Different Kinds of IPRs and its Ownership, Assignment & Registration – Copyright, Patent, Trademark, Trade Secret/Dress, Design, Geographical Indication, Plant Varieties and Traditional Knowledge; Infringement and Offences of IPRs – Remedies and Penalties; IT Act 2000 – Basic Provisions and Curb of Cybercrimes in India; Threat of Plagiarism and IPRs		7
		Total Contact Hours	30

Suggested Evaluation Methods			
Internal Assessment: 15		**End Term Examination: 35**	
➢ **Theory**	**15**	➢ **Theory**	**35**
• Class Participation:	4	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	4		
• Mid-Term Exam:	7		
Part C-Learning Resources			

Recommended Books/e-resources/LMS:

Ahuja, V K. (2017). *Law relating to Intellectual Property Rights*, India, IN: Lexis Nexis.

Bajpai, B. L., *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow, 2004.

Basu, D.D., *Introduction to the Constitution of India* (Students Edition) Prentice Hall of India Pvt. Ltd., New Delhi, 20th ed., 2008.

Dhar, P.L. & R.R. Gaur, *Science and Humanism*, Commonwealth Publishers, New Delhi, 1990.

George, Sussan, *How the Other Half Dies*, Penguin Press, 1976.

Govindarajan, M., S. Natarajan, V.S. Sendilkumar (eds.), *Engineering Ethics (Including Human Values)*, Prentice Hall of India Private Ltd, New Delhi, 2004.

Harries, Charles E., Michael S. Pritchard & Michael J. Robins, *Engineering Ethics*, Thompson Asia, New Delhi, 2003.

Illich, Ivan, *Energy & Equity*, Trinity Press, Worcester, 1974.

Meadows, Donella H., Dennis L. Meadows, Jorgen Randers & William W. Behrens, *Limits to Growth: Club of Rome's Report*, Universe Books, 1972.

Myneni, S.R, Law of Intellectual Property, Asian Law House.

Narayanan, P, *IPRs*.

Neeraj, P., &Khusdeep, D. (2014). *Intellectual Property Rights*, India, IN: PHI learning Private Limited.

Nithyananda, K V. (2019). *Intellectual Property Rights: Protectionand Management*. India, IN: Cengage Learning India Private Limited.

Palekar, Subhas, *How to practice Natural Farming*, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati, 2000.

Phaneesh, K.R., *Constitution of India and Professional Ethics*, New Delhi.

Pylee, M.V., *An Introduction to Constitution of India*, Vikas Publishing, New Delhi, 2002.

Raman, B.S., *Constitution of India,* New Delhi, 2002.

Reddy, B., Intellectual Property Rights and the Law, Gogia Law Agency.

Reddy, N.H., SantoshAjmera, *Ethics, Integrity and Aptitude*, McGraw Hill, New Delhi.

Sharma, Brij Kishore, *Introduction to the Constitution of India,* New Delhi,

Schumacher, E.F., *Small is Beautiful: A Study of Economics as if People Mattered*, Blond & Briggs, Britain, 1973.

Singles, Shubham et. al., *Constitution of India and Professional Ethics,* Cengage Learning India Pvt. Ltd., Latest Edition, New Delhi, 2018.

Tripathy, A.N., *Human Values*, New Age International Publishers, New Delhi, 2003.

Wadehra, B.L., Law relating to Intellectual Property, Universal Law Publishing Co.

Relevant Websites, Movies and Documentaries:

Value Education Websites, http://uhv.ac.in, http://www.uptu.ac.in.

Story of Stuff, http://www.storyofstuff.com

Cell for IPR Promotion and Management: http://cipam.gov.in/.

World Intellectual Property Organization: https://www.wipo.int/about-ip/en/

Office of the Controller General of Patents, Designs & Trademarks: http://www.ipindia.nic.in/

Al Gore, *An Inconvenient Truth*, Paramount Classics, USA.

Charlie Chaplin, *Modern Times*, United Artists, USA.

Modern Technology – The Untold Story, IIT, Delhi.

A. Gandhi, *Right Here Right Now*, Cyclewala Productions.