Course of Study

Meta University Concept based Course

M. Sc. (Mathematics Education)

A joint degree postgraduate program by
University of Delhi & Jamia Millia Islamia

Scheme of study and examination

Cluster Innovation Centre
University of Delhi

INDEX

Meta University Concept based Course

M. Sc. (Mathematics Education)

Partners: University of Delhi & Jamia Millia Islamia
Administration: Cluster Innovation Centre (CIC), University of Delhi

Philosophy: The Meta University concept marks a paradigm shift in Higher Education in India. It is based on the premise that the 'Whole is Greater than the Sum of the Parts'. By drawing upon the established excellence of the partners, the Meta University concept can utilize, exploit and create synergy between programmes, activities and institutions. It shall serve as a platform for communication, collaboration and co-operation that will optimize scarce resources as well as free students from the tyranny of boundaries and the constraints of location. Using India's growing IT tools, the Meta University concept combines the best in traditional systems with the new opportunities for knowledge enhancement. The programme will bring benefits to all stakeholders with its expected outcomes:

- New programmes
- Flexible platforms
- Wide reach - transcends the tyranny of geography & tradition
- Greater inter and trans-disciplinarity
- Higher level of co-operation & collaboration between institutions
- Unleashing new ideas
- Innovation for problem solving

Key Ingredients of the Meta University model:

- Creates a new paradigm in knowledge systems
- Reliance on National Knowledge Network
- Pooling of resources by different institutions
- Creation of synergies in innovative programmes
- Use of information technology for virtual learning
- Innovation in knowledge acquisition
- Combining "Collaborative learning" and "Trans-disciplinary learning"
- Mentor to serve as the Catalyst

Objectives of the course M.Sc.(Mathematics Education):

- To move away from the conventional pedagogy of teaching mathematics especially at school level and to include methods of facilitating learning such as storytelling, projects, group work and participative learning.
- To use technology as significant aid in learning.
- To impart knowledge of some basic concepts and principles of the discipline.
- To establish inter-disciplinarity between mathematics and other subjects from Humanities and the Social Sciences.
- To encourage collaborative learning through group activities and hands-on learning.
- To provide in-service training for school teachers.
- To learn to apply mathematics to real life situations and help in problem solving.

Methodology:
Under the concept of Meta University, M.Sc. (Mathematics Education) is a joint degree two year postgraduate programme jointly offered by University of Delhi and Jamia Millia Islamia. Cluster Innovation Centre (CIC), University of Delhi, administratively manages the program. The program aims to give the students some theoretical inputs and substantial hands-on experience in knowledge-making. The Degree course reflects a transdisciplinary approach and will promote fresh viewpoints, making the learning and teaching process joyful and productive.
Teaching may adopt several platforms including class room, virtual and project based learning. Interactive methods of instruction will be encouraged. Students will take combinations of courses at both Jamia Millia Islamia and at the University of Delhi. Courses available on-line or part time will also be permitted.
Hands on learning, integrating school internships and innovation projects will be given vital importance. Mentors shall play key role in group project work. Mentors will be carefully selected for their expertise in the relevant areas. They may be from both within the partner institutions and outside.

Eligibility criteria:
Graduate degree in any discipline provided the applicant has done at least two full-fledged papers in mathematics at the undergraduate level.

Admission Procedures:
Admission will be through Entrance Test (85% weightage) followed by interview (15% weightage) of shortlisted candidates (4 times of the number of seats).

Number of Seats:
Twenty (20) with following distribution of seats:
University of Delhi: 10
Jamia Millia Islamia: 10

Reservation Policy:
Number of seats shall be reserved as per rules of the two institutions, wherever the student is admitted.

Per Semester Fee:
To be determined mutually by partner universities i.e. University of Delhi and Jamia Millia Islamia. Presently fee is Rs.5000/- per semester.

Evaluation
- For projects, testing methodology will include group testing.
- Transfer of grades/credits between Jamia Millia Islamia and University of Delhi.

Mentorship
Project work/ Practicum will be closely supervised by faculty of DU/JMI and Mentors who may be from outside the host institutions.

Examination and result:

The examination for papers studied by students at JMI will be conducted at JMI. *

The examination for papers studied by students at DU will be conducted at DU.

Declaration of semester-wise result and issuing of Mark-sheets carrying logo of both DU and JMI shall be the responsibility of Examination Branch University of Delhi.

* JMI examination branch will provide result of these papers to DU.

Elaborated examination scheme is given later in this document.

Joint Degree of DU & JMI:

On successful completion of the program, joint degree will be awarded to students enrolled in Meta University concept course M.Sc. (Mathematics Education). The joint degree shall carry the logo and signatures of competent authorities of both DU & JMI. The degree shall be in three languages: English, Hindi and Urdu.

Coordination Committee for M. Sc. (Mathematics Education):

As per UGC guidelines, there shall be a coordination committee constituted by participating universities for each Program.

The participating universities shall be responsible for deciding

(a) Duration of Programme
(b) Number of course required for the programme
(c) Fee structure for the program
(d) Number of students in the programme
(e) Infrastructure requirements
(f) (i) Framing syllabus
    (ii) Number of Lectures and associated activities for the course
    (iii) Number of credits for the course
    (iv) Evaluation procedure
(g) Any other related matter

The Coordination Committee shall ensure timely decision on the above issues and other related issues.

The composition of the Coordination Committee for Meta University concept program of DU & JMI namely M. Sc. (Mathematic Education) shall be:

1. The Director, Cluster Innovation Centre, DU **(Chairman)**
2. The Joint Director, Cluster Innovation Centre, DU (member)
3. Coordinator, Meta University Program, DU (**Member Secretary**)
4. Three nominated members from field of Education/Mathematics Education/ Mathematics/Media, DU (Members) (To be nominated by the Vice Chancellor, DU on the recommendation of the Director, Cluster Innovation Centre, DU)
5. Coordinator, Meta University Program, JMI*
6. Three nominated members* from field of Education/Mathematics Education/ Mathematics/Media, JMI (Members) (To be nominated by the Vice Chancellor, JMI)

   * One of the members from JMI will be designated as **Co-Chairman**.

Course Structure
M. Sc. (Mathematics Education)

Duration of the Course: Four Semester (Two years)
Each Semester: 16 weeks
I Credit: 16 hrs of Theory/ Guided Projects
Total No. of Credits to be acquired for the course: 96

SEMESTER I				
S. No.	Paper Title	Offering Centre	Credits	Maximum Marks
I.1	Calculus: Role in real life	CIC,DU	5	150
I.2	Perspectives in Mathematics Education	CIC,DU	5	150
I.3	Paper option 1 from JMI*	AJKMCRC, JMI	3	100
I.4	Paper option 2 from JMI*	AJKMCRC, JMI	3	100
I.5	Innovation Project-I: Interlinking mathematics and real life problems	CIC,DU/JMI	8	200

SEMESTER II				
S. No.	Paper Title	Offering Centre	Credits	Maximum Marks
II.1	Demystifying the power of data: Probability & Statistics	CIC,DU	5	150
II.2	Curriculum and Evaluation in Mathematics	CIC,DU	5	150
II.3	ICT in Mathematics Education	CIC,DU	3	100
II.4	Learning ways of Mathematical writing	CIC,DU	3	100
II.5	Innovation Project: Internship in Educational setting-I	CIC,DU/JMI	8	200

SEMESTER III				
S. No.	Paper Title	Offering Centre	Credits	Maximum Marks
III.1	Discretizing and understanding Real Life Situations Through a Mathematical Lens	CIC,DU	5	150
III.2	Art of Teaching Mathematics	CIC,DU	5	150
III.3	Digital Technology in Mathematics Education	CIC,DU	3	100
III.4	Research Methodology in Education	CIC,DU	3	100
III.5	Innovation Project-III: Internship in Educational Setting-II	CIC,DU/JMI	8	200

SEMESTER IV				
S. No.	Paper Title	Offering Centre	Credits	Maximum Marks
IV.1	Understanding mathematical language of ordinary differential equations and complex analysis	CIC,DU	5	150
IV.2	Research Investigation in Mathematics Education	CIC,DU	5	150
IV.3	Paper option 3 from JMI*	AJKMCRC, JMI	3	100
IV.4	Paper option 4 from JMI*	AJKMCRC, JMI	3	100
IV.5	Innovation Project-IV: Research Dissertation	CIC,DU/JMI	8	200

* List of papers to be opted from JMI

1. English for Media Communication
2. Advertising
3. Contemporary India and the World We Live in
4. Development Journalism
5. Media Management
6. Public Relations and Corporate Communication
7. Media Laws and Ethics
8. Mass Communication Theory
9. Media Research

Note:

The decision to offer two or three specific papers from amongst the above-mentioned papers or any other course approved by Academic Council of JMI varies from semester to semester. Syllabus of the papers to be opted from JMI presently is as per approved syllabi of AJKMCRC.

Detailed Syllabus of papers to be studied at University of Delhi
M. Sc. (Mathematics Education)

SEMESTER-I

I.1 Calculus: Role in real life

Calculus is the most powerful tool in mathematics with widespread applications. The pedagogy of this paper is "think and then do". The paper builds up on the topics, namely limits and continuity, differentiation and integration and then move on to more advanced applications in real life problems.

Topics and Applications:

a. Continuous compounding of interest, finding the circumference of circle from an n polygon inscribed in it, calculating the value of pi through limits, understanding of the ideas of limits and continuity graphically, calculating limits at infinity, indeterminate forms, special limits involving exponential and logarithmic functions, asymptotes.
b. Improved facility in algebraic manipulation, graphing of quadric surfaces.
c. Comparing the graphs of a function, its first derivative and its second derivative, sketching curves, solving optimization problems, fluency in differentiation, concavity and inflexion points, how derivatives affect the shape of the graph.
d. Modeling average speed of traffic, temperature, population, etc., computing future value of a continuous income flow, flow of blood through an artery, fluency in integration, integration as a limit of a sum, volume of a frustum of a cone, cap of a sphere, volume of earth (not as a sphere but as an oblate spheroid).
e. Staggered start of a race, Gabriel's horn (finite volume but infinite surface area), parametric equations of curves, arc length and surface area.
f. Path of a projectile, Kepler's laws of planetary motion, and introduction of Vector valued functions, differentiation and integration of vector valued functions.
g. Derivation of Newtonian formula of kinetic energy from Einstein's special theory of relativity, modeling of a simple pendulum, understanding the ideas of sequences, infinite series including Taylor approximations.

h. Topographic maps, isothermal surfaces, functions of several variables, level curves and surfaces, limits and continuity of functions of two and three real variables, partial differentiation (two variables), partial derivative as a slope, partial derivative as a rate.

Reading list

- T. M. Apostol Calculus, Volumes 1 and 2, Wiley Eastern, 1980.
- Hughes-Hallett et al., Calculus - Single and Multivariable, John-Wiley and Sons, 2003.
- James Stewart, Calculus, , Thomson, 2003.
- G. B. Thomas and R. L. Finney, Calculus and Analytic Geometry, Addison-Wesley, 1998.

Internet Resources (viewed on 23 June 2014)

1. http://academicearth.org/subjects/mathematics/category: 107
2. http://academicearth.org/subjects/mathematics/category: 109
3. http://www.intmath.com/applications-differentiation/applications-of-differtiationsintro.php
4. http://www.math.scar.utoronto.ca/calculus/redbook/
5. http://www.analyzemath.com/calculus.html
6. http://web.monroecc.edu/calcNSF/
7. http://www.math.dartmouth.edu/~klbooksite/

I.2 Perspectives in Mathematics Education

Mathematics is a discipline of multiple perspectives. Mathematics helps us to understand and organize things around us. Mathematics influences every aspect of human life but the way mathematics is taught in schools does not reflect the necessity, utility and aesthetics in Mathematics teaching. The beauty of Mathematics lies in its simplicity and freedom. The field of Mathematics Education looks into the pertinent gap between Essence of Mathematics and Teaching of Mathematics.
The paper discusses the foundations of Mathematics and evolution of Mathematics Education in historical and socio-cultural perspectives.

a. Nature, Philosophy and Foundation of Mathematics

   Study of dual Nature of Mathematics: from cognitive to social, Principals of Mathematics, Pure vs Applied Mathematics, Paradoxes in Mathematics, Philosophy of Mathematics and Mathematics Education, History and culture of Mathematics

b. Philosophical, cultural, social, historical and psychological facets of Mathematics Education

Philosophy of Mathematics Education, Mathematics Education in Social and Political context, Mathematics as an intellectual property vs Mathematics as a humanistic discipline, History of Mathematics in and for the curriculum, Mathematics and symbolization, Mathematics in popular culture, knowing in Mathematics

c. Structuration in Mathematics: Axiom, Postulate, Mathematical Statement, Language, Theorem and Proof

Nature of mathematical ideas, Kinds of Mathematical statement, Mathematical Statements and proofs, Relation of Mathematics to logic, mathematical concepts and conceptual diversity, Primitive prepositions in Mathematics, Geometries and contradictions

d. Origin and development of Mathematical Ideas

Evolution of numbers, Quantity and measurement, birth of algebra, emergence of calculus and beyond; beyond numbers: set theory; Infinity, Infinitesimal and Continuity

e. School Mathematics in the changing world

School Mathematics as social classification, Issues of equality and excellence in school mathematics, Gender stereotypes in Mathematics, Mathematics for future vs Mathematics for appreciation, principles and Standards for school Mathematics, Mathematics literacy and Mathematics for all

Practicum: Open House discussion on Strands and Contemporary Issues in School Mathematics Education/ Review of one book from the reading list

Reading list:

- An Introduction to the History of Mathematics, Third Edition by Howard Eves, Publisher: Cengage Learning (1990)
- The Calculus Gallery, Masterpieces from Newton to Lebesgue by William Dunham (Princeton University Press) (2008)
- The Man Who Knew Infinity by Robert Kanigel, Little Brown Book Group (1992)
- What is Mathematics Really? By Reuben Hersh, Oxford University Press (1999)
- **The Foundations of Mathematics by Ian Stewart and David Tall,** Oxford University Press (1977)
- Does God Play Dice? By Ian Stewart, Blackwell Publishing (1989)
- A Concise History of Mathematics by By Dirk Jan Struik, Courier Dover Publications (1987)
- Universal History Of Numbers by Georges Ifrah, John Wiley & Sons (2000)

- Mathematics: New Golden Age by Keith Devlin.Mathematics: The Science of Patterns By Keith Devlin, Scientific American Library (1997)
- Guillen, M. (1983). *Bridges to Infinity: The Human Side of Mathematics*. Boston: Houghton Mifflin.
- A Mathematician's Apology by G.H. Hardy The Mathematical Experience by Philip J. Davis & Reuben Hersh, Cambridge University Press (2004)
- Bell E. T. (1940) : The Development of Mathematics, New York, McGraw Hill.
- Burton, David M (1985): The History of Mathematics Boston, Allyn and Bacon.
- Wilder R. K. (1952) : Foundations of Mathematics, New York, John Wiley and Sons.
- Courant R., Robbins H. (1963): What is Mathematics? Oxford University Press.
- Iglewiez, Boris and Stoyle, Judith (1973): An Introduction to Mathematical Reasoning, New York : The MacMillan Co.
- Polya, G. (1957): How to solve it, Garden City, New York: Dobleday.
- Polya, G. (1962), Mathematics Discovery, Vol. I & II, New York, John Wiley and Sons.
- John-Steiner V. & Mahn H.(1996). Socio Cultural Approaches to Learning and Development: A Vygotskian Framework. Educational Psychologist
- Azzouni J. (2006) How and Why Mathematics Is Unique as a Social Practice in Reuben Hersh (eds.) 18 Unconventional Essays on the Nature of mathematics. Springer Science, Inc.

I.3 PAPER OPTION 1 FROM JAMIA MILLIA ISLAMIA *

*Detailed syllabus of this paper is given later in this document.

I.4 PAPER OPTION 2 FROM JAMIA MILLIA ISLAMIA *

*Detailed syllabus of this paper is given later in this document.

I.5 INNOVATION PROJECT-I: INTERLINKING MATHEMATICS AND REAL LIFE PROBLEMS

Students need to identify and work on real time problems that can be solved through mathematical modeling and problem solving.

Innovation projects shall be carried out under the guidance of a mentor/mentors.

SEMESTER-II

II.1 Demystifying the power of data: Probability & Statistics

Uncertainty prevails in decision making, in testing compatibility of samples, and everywhere in day-to-day life. This paper aims to provide the basic understanding of the subject and the tools used to understand these uncertainties. The student will be able to fit, interpret, diagnose and predict simple real life models involving probability and statistics.

Topics and Applications:

- Sampling distributions, hypothesis testing, interval estimation, likelihood, analysis of categorical
- data, joint, marginal and conditional distributions, ANOVA and regression.
- Computer program R and its application to simple models.
- Statistical procedures and their implementation through the statistical package R, sampling
- distributions and randomness, likelihood analysis, bivariate, marginal and conditional
- distributions, curve fitting, linear regression, test statistic and their significance.

Reading List

- B. Bowker and G.J. Liberman, Engineering Statistics, Asia, 1972.
- R.V. Hogg and E.A. Tanis, Probability and Statistical Inference, Macmilan, 1983.
- N.L. Johnson and F.C. Xeen Leone, Statistics and Experimental Design in Engineering and the Physical Sciences, Vol. I and II, , Wiley Inter science, 1977.

Internet Resources: (viewed on 23 June 2014)

1. http://www.intuitor.com/statistics/
2. http://wiki.stat.ucla.edu/socr/index.php/Probability_and_statistics_EBook
3. http://www.ebook3000.com/A-Modern-Introduction-to-Probability-andStatistics_20862.html

II.2 Curriculum and Evaluation in Mathematics

The broad aim of this course is to develop holistic understanding of "Education" as a developmental force and how the purpose of education conceptualizes the idea of curriculum selection and legitimization of formal curriculum content. It further facilitates the student 's understanding on social influences on the aims of education and its' impact on the curriculum planning and implementation with focus on school Mathematics Curriculum . The course focuses on understanding aims of teaching Mathematics as continuum from narrow aims to higher aims; organization of Mathematics Curriculum (in the light of latest NCF, Position Paper on Teaching of Mathematics with special focus on twin premises of learning mathematics and universalization of schooling)

- Perspectives in Curriculum with reference to society, power and knowledge selection

Analysis of curriculum as intent and as reality; curriculum as the reflection of educational ideas and aspirations to be operationalized; curriculum as means to provide experiences to realize educational proposal into practice, Analysis of assumptions: the nature of knowledge, the nature of the child and the nature of the society, Debate on selection of knowledge, Debate on competing conception of balance and development of individual needs and the needs of the society.

- Process of curriculum development

Analysis of models: 'Objective model' and Process model', approaches to curriculum development: Role of central and state governments of India, Centralized and de-centralized curriculum development, Evaluation of curriculum as a whole.

- Concept of a National Curriculum Framework vs National Curriculum

Concept of curriculum framework, Kinds of curriculum framework, Curriculum in a democratic setup, Curriculum to facilitate and respect diversity, Concept of a National Curriculum Framework rather than a National Curriculum to help establish uniformity of democratic and secular norms, with the flexibility of approach and local contextually

- Understanding aims of teaching mathematics as continuum from narrow aims to higher aims

Organization of Mathematics Curriculum (in the light of latest NCF, Position Paper on Teaching of Mathematics with special focus on twin premises of learning mathematics and universalization of schooling)
Practicum: Time line on development of reforms in Mathematics Education in India/ Comparative analysis of International Mathematics Curriculum

Reading List

- The Curriculum: Theory and Practice by A.K. Valley, Sage Publication (2009)
- Curriculum: From Theory to Practice by Wesley Null Rowman & Littlefield, Rowman & Littlefield Publishers (2011)
- Contemporary Issues in Curriculum (6th Edition) by Allan C. Ornstein , Edward F. Pajak, Stacey B. Ornstein , Published by Pearson (2014)
- Curriculum Change and Innovation (2012) Shirley S. Y. Yeung, John T. S Lam, Anthony W. L. Leung and Yiu Chun Lo Hong Kong University Press
- Mathematics Curriculum in School Education (2014) by **Li**, Yeping, Lappan**,** Glenda (Eds.)Springer Publishers
- Perspectives on the Design and Development of School Mathematics Curricula Paperback –(2007) by National Council of Teachers of Mathematics
- Mathematics Curriculum: Issues, Trends, and Future Directions (Seventy-second Yearbook,2010) by Barbara J. Reys, Robert E. Reys Rheta Rubenstein, Published by NCTM

- Critical Issues in Mathematics Education Edited by: Paul Ernest, Brian Greer, Bharath Sriraman, Information Age Publishing (2009)
- A Decade of Middle School Mathematics Curriculum Implementation Lessons Learned from the Show-Me Project (2008) Edited by Margaret R. Meyer, University of Wisconsin–Madison and Cynthia W. Langrall, Illinois State University

II.3 ICT in Mathematics Education

Technology has changed the course of education. Effective use of technology can do a lot to benefit learners. The paper focuses on developing appropriate understanding, well coordinate and sound pedagogical knowledge to make judicious uses of technological tools for teaching mathematics beyond boundaries.

a. Potentials of ICT in Mathematics Education

ICT as a change agent, Place and purpose of technology in the curriculum, Means of ICT, technology embedded pedagogy

b. ICT for enhanced learning

Content planning using ICT, Role of ICT in content differentiation, ICT and self-paced learning, Use of ICT in inclusive classroom

c. Safety issues in use of ICT

Technology in the hands of teacher and student, connectivity through ICT on campus and off campus, learning space, e-content versus authentic information

Reading List

- Introduction to Information and Communication Technology in Education (2005) E-book by David Moursund , Teacher Education, University of Oregon
- ICT in Primary Education: Analytical survey(2012) by UNESCO
- Research on e-Learning and ICT in Education(2012) by **Jimoyiannis**, Athanassios (Ed.), published by Springer
- ICT: Changing Education (2001) by Chris Abbott, Psychology Press
- Technology, Innovation, and Educational Change: A Global Perspective: A Report of the Second Information Technology in Education Study, Module 2 (2003) by **Robert B. Kozma published by International Society for Technology in Education**
- Teaching Secondary Mathematics with ICT (2004) by,Sue Johnston-Wilder, David Pimm, McGraw-Hill International
- Teaching Mathematics Using ICT 3rd Edition (2010) by Adrian Oldknow Ron Taylor Linda Tetlow , published by Continuum International Publishing Group

II.4 Learning ways of Mathematical Writing

Mathematics is a sophisticated language written with lots of precision and accuracy. It follows certain rules which need to be followed by people who would like to write good mathematical content. The paper focuses on the art of mathematical writing to enable students to write quality content that is conceptually and pedagogically sound. The paper will focus on learning of software on mathematical writing.

a. Mathematics as a language and expression

Exploring mathematical ideas from language lens, features of mathematical language, evaluation of algebraic symbolism

b. Basics of Mathematical writing

Essential rules of mathematical writing, technical aspect of mathematical writing, adding creativity in mathematical content

c. Mathematical writing software

Writing on computer using software, namely, LateX, MathWriter,MathType

Practicum: Review and presentation through exemplary pieces of mathematical writing

Reading List

- Introduction to Mathematical Writing by Franco Vivaldi, School of Mathematical Sciences, The University of London, 2014
- Handbook of *Writing* for the *Mathematical* Sciences(1998) by Nicholas J. Higham, Published by The Society of Industrial and Applied Mathematics
- David K Pugalee, Writing, mathematics, and metacognition: Looking for connections through students' work in mathematical problem solving, *School Science and Mathematics*, May 2001.
- Donald E. Knuth, Tracy Larrabee, and Paul M. Roberts, *Mathematical writing*, Mathematical Association of America, 1989.
- Steven G. Krantz, *A primer of mathematical writing: being a disquistion on having your ideas recorded, typeset, published, read and appreciated*, American Mathematical Society, 1997.
- John Meier and Thomas Rishel, *Writing in the Teaching and Learning of Mathematics*, Mathematical Association of America, 1998.
- Candia Morgan, *Writing Mathematically : The Discourse of 'Investigation'* (Studies in Mathematics Education), Falmer Press, 1998.

II.5 INNOVATION PROJECT-II: INTERNSHIP IN EDUCATIONAL SETTING-I

This project will be carried out in schools as INTEGRATED SCHOOL INTERNSHIP PROJECT to experience mathematics teaching and learning, understanding classroom behavior and issues in assessments.

Innovation projects shall be carried out under the guidance of a mentor/mentors.

SEMESTER-III

III.1 Discretizing and Understanding Real Life Situations through Mathematical Lens

In modern world, most jobs involve interaction with computers. The computing and embedded systems technologies break additional barriers; even the day to day life and common activities now involve interacting with a computing device.

a. Graphs (bipartite, Euler, Hamiltonian, Planar)
b. Euler's V-E+F=2 Theorem, subdivisions, Kuratowski's Theorem,
c. matching, Hall's Marriage Theorem, assignment problems
d. counting sets, subsets, multisets, inclusion/exclusion, applications
e. Vectors and geometry
f. Systems of linear equations, echelon form, Gaussian elimination, linear independence.
g. Matrices, multiplication, transpose, inverses, linear maps. Intro to subspaces and bases. Rank.
h. Eigenvalues and eigenvectors. Determinants

Reading List:

- Linear Algebra and its Applications, D. C. Lay, Addison Wesley, 2005.
- A Modern Introduction, David Poole, Linear Algebra, Brooks Cole, 2011.
- Discrete and Combinatorial Mathematics, Ralph Grimaldi, International Edition, 2003.
- Discrete Mathematics and Its Applications, K. H. Rosen, McGraw-Hill, 2008

III.2 Art of Mathematics Teaching and Evaluation

The context of learning plays an important role to foster creativity, logic and concept building. The humanistic and realistic approach developed through the paper is rooted in belief that leaners construct the knowledge on their own in a stimulating environment. The role of teacher is to organize socially relevant and resourceful learning environment for active participation if learners. The paper emphasis on develop pedagogical and assessment paradigms to facilitate math learning for all.

a. Theories of Teaching and learning of Mathematics
   Styles and strategies for teaching mathematics, theories of learning (Dewey, Bruner, Piaget, Denies, Vygotsky) connecting theory and practice in mathematics teaching, facilitating culture of learning in mathematics classroom
b. Addressing Pedagogical Concerns in Mathematics classroom
   Critical content of school mathematics: Numbers, Algebra, Geometry, Probability and Statistics, Calculus, limits and continuity with emphasis on research in teaching and learning
c. Assessment for Active Mathematics learning
   Models of assessment, Assessment for learning and assessment of learning, assessment for teaching, Interpreting assessment, developing assessment plan for diverse learners
d. Mathematics across Curriculum
   Mathematics as a discipline of interdisciplinary approach, creative ways of developing mathematical ideas across curriculum
e. Resources for Mathematics Teacher
   Learning Mathematics through Minds on and Hands on, facilitating learning using active use of resources, developing innovative resources to develop mathematical ability (games, puzzles, models, hands on kits)

Practicum: Focused Discussion Forum to initiate dialogue and sharing on School Internship Experiences

Reading List

- Skemp R. (1987). The Psychology of Learning Mathematics. Lawrence E Hillsdale.
- Hiebert & Lefevre (1986). Conceptual and Procedural Knowledge in Mathematics: An Introductory Analysis by J. Hiebert (eds.) Conceptual and Procedural Knowledge: The case of mathematics. pp.1-27.
- Davis R. B. (1983). Complex Mathematical Cognition In H. P. Ginsburg (eds.) The Development of Mathematical Thinking. New York: Academic press. pp. 253-290.
- Resnick, L. B., & Ford, W. W. (1981). The Psychology of Mathematics for Instruction. NJ: Lawrence Erlbaum
- Cobb P. (1994). Where Is the Mind? Constructivist and Socio-cultural Perspectives on Mathematical Development. Educational Researcher, Vol. 23(7), pp. 13-20.

- Mitchelmore M. & White P.(2010) Teaching Mathematical Concepts: Instruction for Abstraction. Australian Catholic University National, Sidney Australia.
- John-Steiner V. & Mahn H.(1996). Socio Cultural Approaches to Learning and Development: A Vygotskian Framework. Educational Psychologist.
- Bell E. T. (1940) : The Development of Mathematics, New York, McGraw Hill.
- Black P., Harrison C., Lee C. Marshall B. Wiliam. D (2003): Assessment for Learning: Putting it into Practice, Open University Press
- Inside the Black Box: Raising Standards Through Classroom Assessment (2005) by Dylan Wiliam, Published by NFER Nelson

III.3 Digital Technology in Mathematics Education

Technology including multimedia is an asset to expand the reach of classroom teaching. The paper builds up pedagogical orientation to integrate use of digital technologies into mathematics classroom. The paper gives an opportunity to develop creative resources using available technology such as software & applets to foster critical thinking in mathematics learning.

a. ICT embedded Mathematics Pedagogy

Content specific mathematics pedagogies using digital resources, web-based innovations

b. Digital Technology in Mathematics Classroom

Designing web-based learning environment (web-site, blogs, virtual classroom etc)

c. Exploring Mathematics through online resources

Learning software for mathematics teaching and content design (CMAP, Geometer, Sketchpad, Geogebra, Graphing Calculator 3D,Captivate, Photoshop, Coral Design)

Practicum: Preparing E-content/E-resource/E-assessment/web-based classroom

Reading List

- The Mathematics Teacher in the Digital Era (Vol II) (2014) by Clark-Wilson, Alison, Robutti, Ornella, Sinclair, Nathalie (Eds.), Published by Springer
- Mathematics Education with Digital Technology (2011) by*:* Adrian Oldknow*, Published by Continuum*
- Research on e-Learning and ICT in Education (2012) by Jimoyiannis, Athanassios (Ed.), published by Springer

III.4 Research Methodology in Education

The paper focuses on idea of research in education and various research designs highlighting the quantitative and qualitative methods of data collection and data analysis. It also sensitizes students into the challenges of carrying out research in the field of education. Students are expected to do micro research project in educational setting to connect theory into practices.

a. Introduction to Educational Research

Research as source of inquiry, role of research in the field education, qualitative and quantitative paradigms of research, role of theory in research

b. Research Paradigms and Design

Research design in educational research, techniques in data collection and data analysis, relation between data collection, objectivity, reliability, validity and statistical inferences

c. Understanding Research Processes

Steps in carrying out research, research planning, writing proposal, review of literature, hypothesis, tools design, data collection and analysis, report writing

Practicum: Writing and defending a research proposal/ Micro research project

Reading list:

- Best J.W. (1999). Research in Education, New Delhi: Prentice Hall of India Pvt. Ltd.
- Reason, P. & Bradbury, H. (Eds) (2006). Handbook of action research: Concise paperback edition: Thousand Oaks, CA: Sage.
- Borg, W.R. and Gall, M.D. (1983). Educational Research – An Introduction, New York: Longman, Inc.
- Christensen, L. (2007). Experimental Methodology. Boston: Allyn & Bacon.
- Research Methods in Education (5th Edition)2000 by Louis Cohen ,Lawrence Manion ,Keith Morrison by RoutledgeFalmer
- Clive Opie (2004). Doing Educational Research- A Guide for First time researchers. New Delhi: Vistar Publications.
- Cohen,Manion & Morrison (2003) Research Methods in Education (V Edition) , Published by Taylor & Francis,
- Fraenkel, J.R., Wallen, N.E. (1996). How to Design and Evaluate Research in Education. New York: McGraw Hill.
- Stake, Robert E. (1995). The Art of Case Study Research. Thousand Oaks: C.A: Sage.
- Reason, P. & Bradbury, H. (Eds) (2006). Handbook of action research: Concise paperback edition: Thousand Oaks, CA: Sage.
- Sharma, S.R. (2003). Problems of Educational Research. New Delhi: Anmol Publications Pvt. Ltd.

III.5 INNOVATION PROJECT-III: INTERNSHIP IN EDUCATIONAL SETTING-II

This project will be carried out in schools as Advanced internship in schools or other educational institutes / organizations working actively in the area of mathematics education. It will be a focused internship in specialized areas.

Innovation projects shall be carried out under the guidance of a mentor/mentors

SEMESTER IV

IV.1 Understanding Mathematical language of Ordinary Differential Equations and Complex Analysis

Modeling is the process through which real life problems are converted to the mathematical language. This paper aims to develop techniques required to study the models involving differential equations. The methodology will be to first analyze and understand the problem, then write down the governing equations, solve them and then analyze the solution. The problems will be picked up from engineering, ecology, medicine, etc.

Topics and Applications:
Differential equations, solution by series expansion, analytic functions, contour integrals, Laurent series and residues.

1. Application of first order differential equation to draining a tank, harvesting of renewable natural resource, indoor temperature oscillation, flight trajectory, survivability with aids.
2. System of linear differential equations applied to mechanical systems, electrical network, drug assimilation into the blood, solution of a linear system (in non-degenerate cases) using eigen pairs.
3. Modeling two-axle automobile, earthquake induced vibrations of a multistory building, evaluation and application of matrix exponential (in non-degenerate cases)
4. Planar autonomous linear systems with graphical representation (in non-degenerate cases)
5. Planar non-linear system applied to ecological models, wildlife conservation preserve, mechanical systems, epidemic models, determination of stability and classification of equilibrium of a planar nonlinear system by linearization.
6. Complex numbers and their geometrical interpretation, polar forms, powers and roots.

Reading list:

- T. M. Apostol Calculus,, Volume 2, Wiley Eastern, 1980.
- W. E. Boyce and R. DiPrima, Elementary differential equations, John Wiley, 2005.
- C.H. Edwards and D.E. Penny, Differential equations and boundary value problems:
- Computing and modeling, Pearson education (Singapore), Pte. Ltd., 2005.
- E. Kreyszig, Advanced engineering mathematics, John Wiley, 1999.

Internet Resources: (viewed on 23 June 2014)

1. http://www.sosmath.com/diffeq/diffeq.html

2. http://serc.carleton.edu/sencer/ode_real_world/index.html

3. http://www.diptem.unige.it/patrone/differential_equations_intro.pdf

IV.2 Research Investigation in Mathematics Education

The paper highlights the significant features of mathematics education as a dynamic research field. It lays emphasis on developing critical understanding on issues and investigations in mathematics curriculum, pedagogy and assessment.

a. Trends and Issues in Mathematics Education Research
   Mathematics Educations as a dynamic field with growing input from research, place and purpose of mathematics education research, trends in mathematics education, ethical issues in mathematics education research
b. Interdisciplinary Research in Mathematics Education
   Exploring potential research area, research design in mathematics education: ethnographic research, historical research, case study research, statistical techniques: NPC analysis, correlation, multiple regression, analysis of variance, SPSS for data analysis
c. Dissertation Research
   Working and writing research report

Practicum: Research Colloquia

Reading List:

- Keith L (2013) Vital Directions for Mathematics Education Research, Published by Springer
- Clements, M.A.(Bishop, A., Keitel-Kreidt, C., Kilpatrick, J.,Leung (2013) Third International Handbook of Mathematics Education
- Lyn D (Ed) (2008): Handbook of International Research in Mathematics Education, Published

Journals and Periodical

- Journal for Research in Mathematics Education
- Journal of Research in Mathematics
- Mathematics Teaching
- School Science and Mathematics
- The Mathematics Matter

IV.3 PAPER OPTION 3 FROM JAMIA MILLIA ISLAMIA *

*Detailed syllabus of this paper is given later in this document.

IV.4 PAPER OPTION 4 FROM JAMIA MILLIA ISLAMIA *

*Detailed syllabus of this paper is given later in this document.

IV.5 INNOVATION PROJECT-IV: RESEARCH DISSERTATION

Each student will identify and work on a high priority research problem in mathematics education. The outcome shall lead to writing a research dissertation based on innovative research work.

Innovation projects shall be carried out under the guidance of a mentor/mentors.

DETAILED SYLLABUS AND LIST OF PAPER OPTIONS AVAILABLE FROM JAMIA MILLIA ISLAMIA FOR PAPERS I.3, I.4, IV.3 AND IV.4

1. English for Media Communication
2. Advertising
3. Contemporary India and the World We Live in
4. Development Journalism
5. Media Management
6. Public Relations and Corporate Communication
7. Media Laws and Ethics
8. Mass Communication Theory
9. Media Research

Each of the above courses from Jamia Millia Islamia is of 3 credits (3 hrs a week).
The decision to offer two or three specific papers from amongst the above-mentioned papers or any other course approved by Academic Council of JMI varies from semester to semester. Syllabus of the papers to be opted from JMI presently is as per approved syllabi of AJKMCRC.

English for media communication

Introduction:

Media communication entertains, educates, and provokes public debates. It is being practiced across different media outlets like newspapers, radio, and television. And in more recent times, the development in digital technology has led to a massive growth of on-line communication. This course introduces the student to a wide range of skills and disciplines associated with the use of English in mass communication.

Objectives:

- To enable students to improve their ability to compose mass communication texts, particularly with regard to grammar, vocabulary, spelling, punctuation, etc.
- to expose them to different types of mass communication texts with a view to analyzing rhetorical organization and stylistic features of mass communication discourse
- to enable them to try their hand at authoring and editing various types of mass communication texts

Course Description:

Unit 1

- Accuracy Development: Using real-life mass communication situations, students will work on aspects of grammatical accuracy, lexical accuracy, and speech accuracy (in developing speech accuracy the focus will be on correct English pronunciation: RP, the 'Received Pronunciation' – the BBC accent/ Standard Indian Pronunciation)

Unit 2

- Discourse Appreciation: To enable students to make a distinction between mass communication and interpersonal communication discourse, students will work with examples of such mass communication texts as editorials, features, articles, interviews, etc. with a view to analyzing their rhetorical organization and stylistic features (teaching materials to be culled from real-life mass communication texts)

Unit 3

- Reading Skills: Students will read selected passages drawn from real-life mass communication texts to monitor comprehension, to recognize methods of persuasion, to summarize, to draw conclusions, to make inferences, to analyze points of view, to identify main ideas, etc.

Unit 4

- Writing Skills: Students will be introduced to the notions of 'process' and 'product' in writing; they will then focus on learning skills of 'process writing' such as brainstorming for ideas, organizing ideas, writing the first draft, improving through drafts, and finalizing the copy etc.

Unit 5

- Authoring and Editing Mass Communication Texts: students will be required to write mass communication texts by using different input- sources like interviews (either face to face or by telephone); public addresses; press conferences; press releases; written documents, etc.; they will then be asked to edit these news texts for producing the final copy (teaching materials will be culled from real-life mass communication texts)

Suggested Readings:

1. Bell, Allen. The Language of News Media. Oxford: Blackwell.
2. Gration, G., J. Reilly and J. Titford. Communication and Media Studies. Basingstoke: Macmillan Education.
3. Mascull, B. Key words in the media. London: Collins Cobuild.
4. Brown, Gillian. Listening to Spoken English. London: Longman.
5. Hildyard, Jim. Spelling Matters. Oxford: Heinemann Educational Publishers.
6. Smee, Mark. Grammar Matters. Oxford: Heinemann Educational Publishers.
7. Corbett, Pie. Rachel Roberts. Grammar Success 4. Oxford: Heinemann Educational Publishers.
8. MacNab, Lindsay, Imelda Pilgrim, and Marian Slee. Skills in English 3R. Oxford: Heinemann Educational Publisher

Advertising

Introduction:

The potential of advertising was realized during the World War I when all sides used advertisements to mobilize people for the war. In the early twentieth century advertising moved out of the arena of print industry and quickly took advantage of the new mass media, using cinema and radio, to transmit commercial messages. The 1950s not only brought postwar affluence to the average citizen in the West but whole new glut of material goods for which, need had to be created. In America it quickly became the hottest consumer property. Till date, Advertising remains one of the strongest communication strategies. It has gained so much importance and influence that the 'commercial break' has now become an integral part of every television programme.

Objectives:

- To introduce the students to the creative, technical, ethical and managerial aspects of advertising and advertising industry.

Course Description

Unit 1

- Advertising as a communication technique: Evolution and Growth of Advertising, Scope of its messages. Advertising effectiveness.
- Different types of Advertising and Different mediums of Advertising.
- Advertising Agencies and the Hierarchy Structure, the Idea Pitching Techniques.
- In house and Out House Advertisement Productions, Advertising Campaigns.

Unit 2

- The Marketing Process and Advertising technique: The Communication Process and Objectives, The Dynamics of Marketing Communications and its Media.
- The Five Ps of marketing, Mega Marketing, Marketing Mix and The Competitive Triangle. Direct Marketing and Precision Marketing.

Unit 3

- The Product Life Cycle, Marketing Mix and Integrated Marketing Communications. Internal Marketing and retaining Customers.
- Laws and Ethics in Advertising, Social responsibility, Apex Bodies in Advertising and their code---ASCI, AAAI.
- Case Studies ---Analyzing the Ethical Aspects.

Unit 4

- The Promotion Mix: Promotion as an investment, The Promotion Mix decision, the push and pull Strategy.

- DAGMAR and the Conviction Model, AIDA Sequence, Promotion and Demand curve relation, The Media Weight Theory.

- Consumer Behavior---External and Internal factors.

- The Process of Advertising Creation—Situational Analysis, marketing plan and Advertising Plan, Advertising Feedback.

Unit 5

- The Brand: Concept and Management, Components of Brand: Strategy and Structure, Positioning, Image and personality.
- The Advertising Appeal: Language, sound, Graphics and Visuals.
- Campaign Planning and writing Briefs, Scripting for Ads.
- Case Study and Analysis of Various Advertisements and Brands.
- Market and advertising research: Types of Marketing Research, Pre Test, Post Test, Positioning research, and Psychographic Analysis

Suggested Readings:

1. Internet Advertising (Theory and Research) by David W. Schumann.
2. Law of Advertising, Broadcasting, Journalism and Public Relations by Michael G. Parkinson.
3. Radio Advertising: The Authoritative Handbook by NTC Business Books.
4. Practical Radio Promotions by Ted E.F. Roberts.
5. High Performance Selling by Ken Greenwood.
6. Selling Radio Direct by Michael C. Keith.
7. Positioning: The Battle for Your Mind by Al Ries.
8. The 22 Immutable Laws of Branding by Al Ries.
9. The 22 Immutable Laws of Marketing by Al Ries.
10. Marketing Warfare by Jack Trout and Al Ries.
11. The fall of Advertising and the Rise of PR by Laura Ries.
12. The Future of Advertising: New Media, New Clients, New Consumers in the Post Television Age by Joe Cappo.
13. The End of Advertising as We Know It by Sergio Zyman.
14. Life After 30 Second Spot: Energize Your Brand With a Bold Mix of Alternatives to Traditional Advertising by Joseph Jaffe.
15. Buzz Marketing: Get People to Talk About Your Stuff by Mark Hughes.
16. Connected Marketing: TV Viral, Buzz and Word of Mouth Revolution by Justin Kirby.
17. Online Marketing by Ravi Damani.

18. Web Copy that Sells: The Revolutionary Formula for Creating Killer Copy Every Time by M Veloso.
19. The New Marketing Manifesto: The 12 Rules for Building Successful Brands in the 21st Century by John Grant.
20. After Image: Mind Altering Marketing.
21. Truth, Lies, and Advertising: The Art of Account Planning by Jon Steel.
22. Behind the Scene in Advertising, Mark III: More Bull More.
23. Creative Advertising: Ideas and Techniques from the World's Best Campaigns by Mario Pricken.
24. Advertising Management: Batra, Aaker and Myers
25. Advertising and Promotion: Belch and Belch
26. The [Un]Common Sense of Advertising: Sanjay Tiwari
27. It Happened in India: Kishore Biyani
28. Consumer Behaviour and Marketing Strategies: Hawkins and Cooney.
29. Marketing Management, Philip Kotler, Kevin Lane Keller

Contemporary India and the World We Live In (Enrichment Paper)

Introduction:

Today the media is mainly obsessed with the news about politics and conflicts around the world. The reason is simple the majority of readers, listeners and viewers buy newspapers or turn to radio or television to know how the politicians running the affairs of the state? Or who is spilling whose blood for what? Unfortunately not only in India but elsewhere in the world too political, foreign and strategic affairs reporters are still considered to be more important than reporters working on other beats. Thus for every reporter, copy writer and editor it is essential to have the basic knowledge of those national and international issues which frequently debated and discussed in media.

Objectives:

- To introduce the students to the politics of Cold War period.
- To introduce the students to the politics of Post Cold War era.
- To introduce the students to the major national, regional and international conflicts.
- To introduce the students to the major national/regional and international organizations and bodies.
- To introduce the students to the foreign and economic policy of India.

Course Description:

Part-I

Contemporary International Scene:

Unit 1

- Unipolar World V/S Multi-polar World.
- East-West Conflict and the NATO Drive Towards Eastern Europe.
- Rise of Russia as Economic-Military Power.
- Major Conflicts: Arab-Israeli Conflict, Afghanistan, Iraq, Iran, Lebanon and North Korea.

Unit 2

- Militant Islam: Ideology, concept of Jihad and growing terrorism.
- North-South Divide: Aspirations of the developed as well developing nations.
- Conflict of civilization

Unit 3

- International Organizations: UN and its organs.
- International Financial Institutions: World Band, International Monetary Fund (IMF) and World Trade Organization (WTO).
- Regional cooperation; SAARC, ASEAN, EU, GCC and others.

Part-II

India's Foreign Policy:

Unit 1

- Conceptualization of Foreign Policy: Continuity and change, ambitions to emerge as a major power.
- India's conception of the UN in the context of its foreign policy objectives and its role in international politics.

Unit 2

- India's Economic diplomacy.
- India's Oil Security.
- Indo-Pak Conflict: Cross border Terrorism and the problem of Kashmir.
- Indo-US Nuclear Deal.

Note: Most of the topics mentioned above will be covered through classroom lectures but efforts will also be made to organize one-day seminars on selected topics.

Suggested Readings:

1. Discovery of India by Jawaharlal Nehru.
2. Wonder That Was India by A.L. Basham.
3. The Partition Omnibus With an Introduction by Mushirul Hasan (Oxford India Paperbacks)
4. India Wins Freedom by Maulana Abul Kalam Azad.
5. Introduction to the Constitution of India by Durga Daas Basu.
6. India's Foreign Policy and its Neighbors by J.N. Dikshit.
7. India and Regional Developments: Through the Prism of Indo-Pak Relations by J.N. Dikshit.

Development Journalism

Introduction

The development journalism module will open a completely different world for students as they discover some exciting possibilities of researching lesser known areas that are neglected by a lazy media. It will familiarize them with the realities of a changing India, developing India and how it is punctuated with anachronisms.

Objectives:

- Developing the Skills to analyze and report the socio economic developmental issues.
- Nourishing the communication skills required for Societal Empowerment.

Course Description:

Unit 1

- The reality of India
- Understanding Development Journalism: How it is dramatically changing in a changing India.
- How it has numerous new areas under it now as the umbrella of what is development grows.
- Challenges before a development journalist.

Unit 2

- Making Development Writing interesting and contemporary.
- How to get your publication interested in a development agenda.
- Tapping sources.
- Building a specialization
- Reporting on Environment, Health, Issues before Society
- Understanding the complex mosaic of India
- Updating yourself all the time.
- Understanding rural realities

Unit 3

- Children's issues
- Burning social issues like feticide, dowry, domestic violence, aging, problems of economic growth, etc.
- Gender issues
- Using all possible resources for research and learning
- How constant learning is the key to understanding complex issues in India.
- Understanding sociology and history to get a perspective.
- Staying positive to beat cynicism that envelops development reporters and writers.

Unit 4

- How to develop a mindset to do serious work of this nature all through life.
- Finding out unusual ideas
- Handling print, online and documentaries on development subjects.
- How to keep development writing serious and readable.
- Using modern writing techniques to beat boredom.
- Development of the idea and final execution
- Using statistics, graphs and pictures.
- Why it is important to bring in investigation and interpretation

Unit 5

Practical writing and reporting exercises on development subjects

Suggested readings:

1. Development Journalism: An Introduction by Dinesh C.Sharma.
2. Development Journalism, what next an agenda for the Press by D V R Murthy.
3. News With Third World perspective by Philip C.Horton
4. Social change by Steve Vago
5. World Development: Report-knowledge for Development . 1999: The World Bank

Media Management

Introduction:

Gone are the days when managing a newspaper or magazine, radio or a television station, was simple. Not very long ago editors were not only had the responsibility of bringing out a newspaper/magazine, or making editorial decisions in a radio or television channel but they were also responsible of administering the news organization in which they worked. Now the editors
have a rival in the form of 'media managers' who are not only responsible for the financial and administrative management of a media organization but also have a say in the editorial matters because editorial decisions have always a bearing on the circulation of a newspaper or the ratings of a television news channel.

Objectives:

To teach the students how to manage different news platforms from newspapers to web portals.

Course Description:

Unit 1

- Introduction to the course
- Media Management
- Principles of Media Management
- Media as an Industry and a Profession
- Preparing yourself for the Management
- Motivation and the work force
- Qualities of Leadership and Management
- Ownership Patterns of Mass Media
- Operations and Structure of News Media Company
- Organization Theory: Delegation, Decentralization, Motivation,
  Control and
- Coordination
- Hierarchy: Function and Organizational Structure of Different Departments.

Unit 2

- Business of Media: Discuss the way in which revenues and profits are achieved.
  Media regulation and possible "effects" of media on individuals and society
- Current Media Scenario including news portals
- Future Media Trends
- Policy Formulation: Planning and Control, Problems, Processes and Prospects of
- Launching Media Ventures
- General Management: Finance, Circulation, Sales Promotion
  (Including Pricing
- And Price War Aspect)

- Advertising and Marketing
- Apex Bodies: DAVP, INS and ABC

Unit 3

- Economics of Print and Electronic Media: Management, Business and
- Financial aspects of Media Management
- Media Budgeting and Finance Management, Budget Control
- Sales Management, Marketing and Market Analysis

Unit 4

- Advertising and Sales and Marketing Strategy
- Competition and Survival, Evolving a Strategy
- Media Planning and Buying
- TAM, INTAM, TRP, GRP and other media jargons
- PR for Building and Sustaining Business and Audience
- Integrated Marketing Communications: ATL and BTL
- Global Marketing Strategy
- Marketing and Research
- Market Survey Techniques

Unit 5

- Employee/Employer and Customer Relations Services: Marketing Strategies, Brand
- Promotion (Space/Time, Circulation), Reach, Promotion, ,
- Human Research Development for Media
- Foreign Equity in Indian Electronic and Print Media and Press Commissions on
- Indian Newspaper Management Structure.

Suggested Readings:

1. Media Management by Jan LeBlanc Wicks and Others.
2. Organizational Behavior by Linda K. Stroh and Others.
3. Human Resource Management by John Bratton and Jeffery Gold.
4. Electronic Media Management by Peter B. Orlik.
5. Staffing Organization by Robert E. Ploy Hart and Others.
6. The Practice of Management by Peter F. Drucker.
7. Radio-Television-Cable Management by James A. Brown, Ward L.Quaal.
8. Putting Total Quality Management to Work by Marshal Sashkin, Kenneth J. Kiser.
9. Daytime Television Programming by Marilyn J. Matelski.
10. Basic Radio Programming by Michael J. Langevin.
11. Motivation and Personality by Abraham Harold Maslow.
12. Creative Management by William Marsteller.

13. Selling Radio Direct by Michael C. Keith.
14. Financial Management by Coker Group, De Marco Associates.
15. Managing Organizations: Functions and Behaviors by Daniel F. Jennings and others.
16. Public Television for Sale: Media, the Market and the Public Sphere by William Hoynes.
17. Future Radio Programming: Cultivating Listenership in Digital Age.
18. Radio Programming: Tactics and Strategy by Eric Norberg.
19. Radio Operations: Management and Employee Perspectives by Lewis B. O'Donnell and Others.
20. Managing in a Time of Great Change by Peter F. Drucker.
21. Ratings Analysis: Theory and Practice by James G. Webster and Others.
22. Systems Theory Applied to Television Station Management by Jr.William G. Convington.
23. Managing Media Convergence: Pathways to Journalistic Cooperation by Kenneth C. Killebrew.
24. Managing in the Media by William Houseley and Others.
25. Making Sense of Change Management: A Complete Guide to Models, Tools, and Techniques of Organizational Change by Esther Cameron.
26. The Change Management Toolkit by C A Carnall.
27. Leading Change by John P. Kolter.
28. Selection Interviews: Process Perspectives by Robert Dipboye.

Public Relations and Corporate Communication

Introduction:
Though PR and Corporate Communication are not new for the West, in India they have acquired immense importance as an area of specialization with the liberalization and globalization of economy. Not only the multinationals but the Indian corporates too employ PR officers and CCs for effective management of media and staff.

Objectives:

- To prepare the students to be able to work as PR persons and Corporate Communicators.

Course Description:

Unit 1

- Understanding the Brand and Brand Equity
- Brand Identity and Reputation - A brief look at some of the legendary Brands (Private/Public) and comprehending brand personality (Case Studies).

Unit 2

- Evolution and History of Public Relations: Definition of PR, PR and Allied Disciplines (Publicity, Propaganda, Public Affairs and Lobbying etc.)
- Symmetrical and Asymmetrical Theories of PR.
- Law and Ethics of PR (Defamation, Copyright, Invasion of Privacy: PRSI Code of Ethics

Unit 3

- Interface of PR with Various Management Disciplines: Human Resource Development, Finance and Marketing etc.
- PR Tools: Interpersonal, Mass Media and Selective Media.

Unit 4

- PR in Industry: Public Sector, Private Sector, and Multinationals.
- PR in State and Central Governments and Functioning of Various Media Units of the State and Union Governments.

Unit 5

- Strategic PR/CC and Management: Defining Strategy and its Relevance in Public Relations and Corporate Communication, Campaign Planning, Management and Execution.
- Optimizing technology in communication design and campaign planning.
- Role of PR/CC in Crisis Communication and Disaster Management

Unit 6

- Building a Distinct Corporate Identity: Concepts, Variables and Process, Making of House Style (Logo, Lettering and Process)
- Corporate Social Responsibility and the new paradigm in Corporate Communication
- Media Relations: Organizing Press Conferences, Facility Visits, Press Briefs.
- Proactive and Reactive Media Relations.

Suggested Readings:

1. Strategic Public Relations Management: Planning and Managing Effective Communication Programme by Erica Weintraub Austin.
2. Law for Advertising, Broadcasting, Journalism and Public Relations by Michael G. Parkinson.
3. Mediamorphosis: Understanding New Media by Roger F. Fidler.
4. The fall of Advertising and the Rise of PR by Laura Ries.
5. PR Power: Inside Secrets from the World of Spin by Amanda Berry.
6. Public Relations Handbook by Theaker.
7. Public Relations: A Practical Guide to Corporate Communications Management by Sandra Oliver.
8. Running a Public Relations Department by Mike Beard.
9. Effective Internal Communication by Lyn Smith.
10. Communicating Change: Winning Employee Support for New Business Goals by T J Larkin.

Media Laws and Ethics

Introduction:

Good reporting is not the only skill necessary to make a news organization reputable. To gain the trust of viewers, listeners or readers serious consideration must also be given to ethical situations that may arise during the course of reporting. In addition to that, the prevalent media laws must be well understood by every reporter editor and must be followed at all times.

Objectives:

- To understand the duties and the rights of a reporter or editor.
- To understand the tricky dilemmas involved in news reporting.
- To understand various national and international laws that governs the Press.

Course Description:

Unit 1

- Introduction to Indian Judicial System and Terminology
- Brief History of Press Laws in India: Before and After Independence.
- Freedom of Expression and Speech under the Constitution of India.
- Laws Governing the Reporting of Court Proceedings and Contempt of Court.
- Laws Governing the Proceedings of Parliament and State Assemblies and Privileges.

Unit 2

- Official Secrets Act and Right to Information.
- Laws Concerning Airwaves.
- Laws against Defamation and Libel
- Press Council of India.

Unit 3

- Theoretical Approaches to Ethics (The Golden Mean, the Categorical Imperative, the Principle of Utility, the Veil of Ignorance, Judeo-Christian Ethics).
- Media Ethics: Ethical Decision Making (Ethics and Media Practitioners, Relationship Between Ethics Political and Social Issues, Economic Issues in Relation to Ethics)

Unit 4

- Fundamental Ethical Standards (Accuracy, Objectivity, Fairness and Balance, Fakery, Truth, Integrity of Sources), Conflict of Interest, Codes of Ethics, Moral Reasoning Processes for Ethical Decisions.
- Ethical Situations and Dilemmas (Business v/s Profession, Freebies and Junkets, Anonymous Attribution, Checkbook Journalism, Right of Privacy v/s Public Interest)

Unit 5

- Sensationalism, Decency and Good Taste (Direct Quotations, Correction of Errors, Fiction and Fact, Impact of Current Trends on Ethics (Economic Demands on Media, Globalization and War on Terror).

Suggested Readings:

1. Press Laws by D.D. Basu (Prentice Hall)
2. Press Laws by Subir Ghosh.
3. Journalistic Ethics by P.K. Bandhopadhyay and Kuldeep S. Arora.
4. Media Ethics: Cases and Moral Reasoning by Clifford G. Christians and Others. Published by Pearson Education.
5. Journalism Ethics by Phillip Seib & Kathy Fitzpatrick.
6. Ethics, Copyright & the Bottom Line by Eastman Kodak.
7. Mass Communication Law and Ethics by Roy L. More.

Mass Communication Theory

Introduction:

Any course in media and journalism requires the development of critical understanding of media and its function. Without a proper ground for understanding media, the media practitioners remain incomplete and insensible. The necessity of good journalists who understand the subtle shades of communication, the effect of processing and dissemination of information at larger scale and the responsibility of mass communication is growing day by day. A journalist who is aware of his/her society, who understands the power of communication and the change that it can make and most of all the impact of his/her work is built only with a proper ground in mass communication theory. The paper helps to make a responsible and good journalist by inspiring the power of thought and critical perception development.

Objectives:

- To develop basic ground of media literacy and critical perspective of analyzing and
- understanding media
- To understand the role, function, process, elements, importance and the characteristics of communication in society
- To understand the development of process and semiotics schools through critical analysis of various communication model
- To understand the growth and evolution of communication theories in relation to the changing society and development of thought
- To introduce to various schools of thought, prominent concepts, ideas and philosophies
- To develop multi-disciplinary approach of higher studies
- To understand the international communication process and development
- To understand the importance, application and growth of communication in development
- To realize the role of journalist in responsible and effective communication

Course Description:

Unit 1: Basics of Mass Communication

- Communication & Perspectives of Understanding: Bias, Objectivity, Stereotyping, Genre, Narrative, Feminist Critique, Media's role in power and politics, Media literacy
- Introduction to communication: Definitions, Elements and Process of communication,Barriers to Communication, Types of Communication

Unit 2: Communication Models & Theories

- Communication models: Rhetoric, SMCR, Shannon & Weaver, Newcomb, Gerbner,Westley-McLean, Berlo, Schramm, Shoemaker
- Mass communication theories: History of media theory, Mass society theory, Magic bullet theory, Propaganda – Behaviorism & Freudianism, Limited effects theory, Two step flow, Agenda setting, Uses & Gratification, Functionalism, Semiotic, Symbolic interaction, Catharsis, Social learning, Social cognition, Cultivation, Critical & cultural theories, Marxist theory, Neo-Marxist theory, Political economy, Hegemony, Spiral of Silence, Public Sphere, Innis & McLuhan, Post-modernism, Post-structuralism

Unit 3: Development Communication

- Development Communication & Development: What is development? Theories of social change, Theories of development
- Development Communication & International Communication: What is development communication? Dominant paradigm of development communication, Information flow theory, International communication – NWICO and beyond, Normative theories, Passing of dominant paradigm, Alternative approach of development communication – alternative media
- Development Communication & Journalism: Development support communication, DSC projects in India & abroad, Planning DSC projects, Journalists & Development communication

Suggested Readings:

1. Mass Communication Theory: An Introduction by Denis Mcquail.
2. Theories of Communication: A Short Introduction by a Mattelart.
3. Understanding Media by Marshall McLuhan.
4. Understanding Media Theory by Kevin Williams (Arnold 2003)
5. Mass Communication Theories and Research by Alixis Tann.
6. Communication Studies: An Introductory Reader, Edited by J Corner Hawthorn.
7. The Process and Effects of Mass Communication by Wilbur Schramm and F. Roborts (Illinois 1971)
8. Key Concepts in Television Studies by Bernadette Casey, Neil Casey, Ben Calvert, Liam French and Justice Lewis (Routledge)
9. Communication and Social Change by P.C. Joshi.
10. Designing Messages for Development by Bella Modi (Sage Publications 1991)
11. The Myth of Information Revolution: Social and Ethical Implications of
12. Communication Technology Edited by Michael Trabant.
13. The Impact of Television Advertising on Children by Namita Unnikrishnan and Shailja Bajpai (Sage Publications)
14. Key Concepts in Journalism Studies by B Franklin and others (Sage)
15. Transnational Television, Cultural Identity and Change: When STAR Came to India by M Butcher (Sage)
16. Mass Communication Theory: Foundations, Ferment, And Future by Stanely J. Baran and Dennis K. Davis

17. Globalization, Development and the Mass Media by Collin Sparks
18. Development as Freedom - Amartya Kumar Sen; Oxford University Press
19. Manufacturing Consent - Edward S. Herman & Noam Chomsky; Pantheon Books
20. Culture, Inc.: The Corporate Takeover of Public Expression - Herbert I. Schiller; Oxford University Press
21. Convergence Culture: where old and new media collide - Henry Jenkins; NYU Press

Media Research

Introduction:
Any masters' course requires the student to develop higher academic aptitude through research paper. Media research not only provides a critical outlook for analyzing media in society, but it helps in developing scientific, logical and objective thought process. The rational approach develops a problem solving attitude and management tendency. The growing research sectors in media require all the media practitioners to know and understand the various research tools and methods. The knowledge of media research helps all journalists and media practitioners to develop their performance further.

Objectives:

- To develop logical and rational thinking and scientific understanding
- To develop critical thinking process and objective approach of solving problem
- To develop research aptitude and academic approach
- To build logical problem solving attitude in relation to particular issue
- To develop wider perspective in identifying and developing research problem
- To understand research areas in media
- To expose to various research tools, methods, concepts and school of thoughts
- To expose to various up-to-date academic research works

Course Description:
Unit 1: Phase I

- **Introduction to Social Science Research:** Development of mass media research, Media research ethics, identifying a research topic, Writing a hypothesis or research questions, being aware of the limitations of a study

- **Quantitative & Qualitative Research:** What is Quantitative Research, What is Qualitative Research, Review of Literature, Citation and Bibliography

Unit 2: Phase II

- **Conceptualization and Measurement:** Variables, Concepts and measurement, Levels of measurement, Units of analysis, Validity and reliability

- **Sampling:** Why sample? Types of sampling, Sampling distribution, Sampling Error

- **Causation and Research Design:** Kinds of explanation, establishing causation, Types of Research Design, Experimental, Quasi-experimental, Longitudinal, Cross-sectional

Unit 3: Phase III

- **Data collection:** What is Data, Primary & secondary data, Data collection tools – Questionnaire, Schedule, Diary, People's meter, Phone, media source, books

- **Quantitative Methods:** Surveys, Content Analysis

- **Qualitative Methods:** Ethnography, Unstructured/Semi-structured interviewing, Participant Observation, Focus Groups, Textual Analysis

Unit 4: Phase IV

- **Data Analysis Techniques (non-statistical):** Grounded theory method, Finding patterns, Constant comparative method, concept mapping, Semiotics, Conversation analysis, Memoing, Coding, Drawing conclusion, Introducing NVivo

- **Data analysis techniques (statistical):** Coding & Tabulation, Univariate, bivariate, multivariate analysis, Frequency distribution, Measures of Central Tendency, Measures of Dispersion – Range, variance, Standard deviation, Introducing SPSS

Total Marks: 100 (Written Exam:50, Final Product: 30, Internal Assment:20)

Suggested Readings:

1. Mass Media Research: An Introduction by Roger D. Wimmer and Joseph R. Dominick
2. The Practice of Social Research by Earl Babbie
3. Qualitative Media Analysis (Qualitative Research Methods) - David L. Altheide; Sage University Press
4. Qualitative Communication Research Methods - Thomas L. Lindlof, Brian C. Taylor; Sage Publications
5. Strategies for Interpreting Qualitative Data - Martha S. Feldman; Sage University Paper
6. Journalism & Mass Communication Quarterly - Association for Education in Journalism & Mass Communication

Advertising Communication: Process and Planning

Unit 1: Advertising Concepts

- Evolution, growth and types of advertising.
- Advertising agencies its hierarchy, structure and functioning.
- Advertising theory: Persuasion, ELM, advertising effects and changes in attitude.
- Understanding the various media for communication-introduction to media operations and media planning.
- DAGMAR and the conviction model, AIDA sequence, promotion and demand curve relation.
- Consumer Behavior---External and Internal factors
- Laws and ethics in advertising, Social responsibility, Apex Bodies in Advertising and their code---ASCI, AAAI.
- Seven Ps of marketing, marketing mix, STP and marketing strategy.
- Product life cycle, marketing mix and integrated marketing communications

Unit 2: Crafting Advertising Campaigns

- The Process of Advertising Creation—Situational analysis, marketing plan and advertising plan, advertising feedback.
- The Brand: Concept and management, strategy and structure, positioning, image and personality
- Advertising approaches and appeals : Language, sound, graphics and visuals and scripting for ads.
- Campaign planning and brief writing.
- Crafting online campaigns: Social media and WOM campaigns
- Retention, audience development using mass and social media: SEO

Unit 3: Evaluation and Assessment of Campaigns

- Market and advertising research: Types of marketing research, pre-test, post-test, positioning research, demographics, psychographics, Using big data

- Public Service Advertising, Social marketing and CSR activities-an evaluation and assessment.

Suggested Readings:

1] Advertising & Promotion – Belch and Belch
2] Consumer Behaviour – Schiffman & Kanuk
3]Advertising Management – Batra, Aaker

Advanced Gaming and Animation Scripting

- User Interface – Mobile gaming
- Game Design
- Game Animation

The Science of Screenplay Writing & Production

1. The elements of design
2. Understand the difference between Theater/ television & Cinema
3. Visualize an idea
4. Developing the main character & other sub characters
5. Developing a synopsis from the idea
6. Generate a treatment for the subject.
7. Build the required scenes to create the crisis, climax & the resolution to narrate the story.
8. The basic screen grammar
9. Basic principles of editing
10. Understanding different image sizes & their functions
11. Guidelines for writing dialogues
12. Production of a short film (Practical)

Puppetry

Course Objectives:

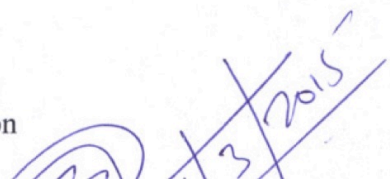
- The objective of this course is to introduce the students to various Traditional forms of communication and media through lectures, visits to performances and student seminars.
- The course will help to strengthen the students to work in teams and managing resources.
- The other objective is to train the students in the art of the Puppetry.
- Students will be encouraged to develop their original scripts and performances in groups and exhibit their ideas through the performances. This helps them to relate the process of communication through traditional media with that through the modern media.
- To Train students in acting, this will help in the other audio visual courses in the later semesters of this course.

Module-1 Understanding the theory and Practice of Puppetry

- Puppet in folk tradition of India
- Different kinds of traditional Puppets – demonstration
- Puppetry in films (ref: Bengali '*Bhrantibilas'*, English '*Sound of Music'*)
- Contemporary Puppet Theatre in India as well as in other parts of the World
- Purposeful application of puppetry in different context /
- difference between traditional and modern puppetry
- Puppetry and its connection to new media like stop animation, T.V etc
- Social application of Puppetry- Puppetry for Communication
- Appropriate Themes for communication
- Understanding the Strengths and limitations of the Puppetry medium

Module-II Developing Puppets, script and stage

- Story Telling Techniques
- Writing a script and making a story board.
- Introduction to materials and tools
- Design and Construction of Puppets
- Dramaturgy, Stagecraft and set design
- Learning to manipulate puppets
- Manipulation exercises
- Blocking, Casting, Rehearsals
- Body and voice exercises
- Location hunting, advertising to assure an audience
- Performance with real audience, Feedback collection
- Analysis and evaluation



Module-III Performance

- Puppet play performance
- Students will chose a school or a public place or any appropriate place to perform in front of real audience. Student will seek feedback from the audience. Students will share the feedback of the audience and their introspection with the rest of the class.

References:

Living Dolls – The Story of Indian Puppets - Jiwan Pani , Publications Division,Ministry of I&B

Karnataka Puppetry – S.A.Krishnaaiah

Shiksha Mein Srijanatmak Natak Evam Kathputli Nartan – Meher Contractor

Handicraft of India – Kamladevi Chattopadhyay

Leather Puppetry in Karnataka – M.S. Nanjunda Rao

Rawan Chaya – Jivan Pani,Sangeet Natak Akademi Publication

Tolu Bommalata –Shadow Puppets of Andhra Pradesh – M.Nagbhushan Sharma ,Sangeet Natak Akademi Publlication

Tolpava Koothu-Shadow Puppets Kerala – G.Venu , Sangeet Natak Akademi Publication

Ayodhya Kand of Tolpava Koothu – KrishnaKutty Pulavar-Sangeet Natak Akademi Publication

Sangeet Natak Vol.XXXVI,issue No. 1,2,3,&4,2001

Sangeet Natak Journal Nos. 98 -127 -128

Sangeet Natak Akademi Annual Report 2002-2003

Brochure of 'Swarn Jayanti Putul Yatra Festival' of the Sangeet Natak Akademi

Indian Puppets by Sampa Ghosh&Utpal.K.Bannerjee.Abhinav Publication,New Delhi.

Kathputli – The World of Rajasthani Puppeteers – Nazir Ali Jairazbhoy

Kathputli Shikshan - Dinesh Chander Bansal

Bachon Ke Liye Putliyan – Devi Lal Samar

Kathputli Natikayan – Bharatiya Lok Kala

Bachon Ki Sanskritik Shiksha – Devi Lal Samar

Puppetry and Folk Dreams – Anupama Shah

Street Theatre

Course Objectives:

- The objective of this course is to introduce the students to various Traditional forms of communication and media through lectures, visits to performances and student seminars.
- The course will help to strengthen the students to work in teams and managing resources.
- The other objective is to train the students in the art of Street Theatre.
- Students will be encouraged to develop their original scripts and performances in groups and exhibit their ideas through the performances. This helps them to relate the process of communication through traditional media with that through the modern media.
- To Train students in acting, this will help in the other audio visual courses in the later semesters of this course.

Module-I Introduction to Traditional Media

- Nature of the performing genre
- Performers and patronage / Background
- Performance: space, text, texture and context
- Performance details: costumes, musical instruments, songs, makeup and characters
- Historical understanding of performance based communication
- Understanding society thorough performance

Module-II Understanding the theory and Practice of Street Theatre

- Understanding various approaches to theatre
- Theatre as a medium of communication
- Form, Content, Themes
- The roots of street theatre in the theatre movement in the India and West
- Body Exercises and warm-ups (every class), group work
- Discussions will be initiated after every exercise.
- Working with senses, actor-non actor addressing the myths.
- Improvisation: arrivals and departures: individual and group.
- Working with imagination, observation.
- Readings on Stanislavsky, Augusto Boal, Checkov, Brecht,Grotowsky,Ngugi.
- Developing Scripts for Street play performance
- Working on movement
- Improvisation: mood swings, music work, song variation.
- Readings on Safdar Hashmi, Utpal Dutt, Habib Tanvir, Guru Charandas, IPTA.
- Voice exercises for Street Theatre: breathing, singing, rhythmic work

- Further exploration of traditional children games in improvisation followed by discussion.
- Indian dances exploring rhythms and basic steps of some folk traditions.
- Developing a street play. Team coordination, props, songs, formations, form
- Performance and audience

Module-III- Performance

- Street Play performance
- Students will chose a school or a public place or any appropriate place to perform in front of real audience. Student will seek feedback from the audience. Students will share the feedback of the audience and their introspection with the rest of the class.

References:

Banes, Sally and Andre Lepecki, eds. (2007) *The Senses in Performance*. New York and London: Routledge

Bradford, D. Martin. *The Theatre in the Street: Politics and Performance in the Sixties America*. University of Massachusetts Press, 2004.

Cohen-Cruz, Jan. Radical Street Performance. Routledge,1998.

de Certeau, Michel. "Part III: Spatial Practices." *The Practice of Everyday Life*. University of California Press,1984.

Deutsche, Rosalyn. (1996) *Evictions: Art and Spatial Politics*. Cambridge, MA and London: The MIT Press

Felshin, Nina, ed. (1995) *But is it Art? The Spirit of Art as Activism*. Seattle: Bay Press.

Harper, Glenn, ed. (1998) *Interventions and Provocations: Conversations on Art, Culture, and Resistance*. Albany: State University of New York Press.

Harris, Sue. (2004) '"Dancing in the Streets": The Aurillac Festival of Street Theatre' *Contemporary Theatre Review* 14.2, 57-71.

Hill, Leslie and Helen Paris, *Performance and Place*. Palgrave Macmillan, 2006.

heatre Journal 55.4 (December 2003): 591-612.

_____. *The Politics of Performance: Radical Theatre as Cultural Intervention*. Routledge, 1992.

_____. *The Radical in Performance Between Brecht and Baudrillard*. Routledge, 1999.

Mason, Bim. *Street Theatre and Other Outdoor Performance*. London and New York: Routledge, 1992.

Meyerhold, Vsevolod. "The Fairground Booth." *Meyerhold on Theatre*. Translated and edited by Edward Braun. Hill and Wang, 1969.

Sanderson, Christopher Carter. *Gorilla Theatre: A Practical Guide to Performing New Outdoor Theatre Anytime, Anywhere*. Routledge, 2003.

Street Theatre: Impressions and Images. Education and Culture: Culture 2000 Programme of the European Union, n.d.

16/3/2015

Gaming and Animation Scripting

Elective 2: Gaming and Animation Scripting +* (Also offered to students of Master of Mathematics Education, a Meta University Course)

- **Game Design**
  1. What is Game
     a. Definition of Game
     b. Why people play games
     c. How games are different from other forms of entertainment
     d. Game Genre
     e. Elements of a game
  2. History of Games
  3. Game Concepts
  4. Game Production Parts
     a. Game Art
     b. Coding
     c. Quality Assurance
     d. Management
  5. Game Development Process
     a. Stages of Game Development Process
  6. Game Design Document
     a. What is Game Design Document
     b. Why it is needed
     c. What are its advantages and disadvantages
     d. Sample Game Design Document
     e. A Game Design Document template
  7. Artificial Intelligence
     a. What is Artificial Intelligences
     b. Artificial Intelligence Techniques
        i. Path Finding
        ii. Flood Fill
        iii. Expert System
        iv. Fuzzy Logic
        v. Neural Network
        vi. Genetic Algorithm

vii. Deterministic Algorithm

- **User Interface – Mobile gaming**

8. User Interface For Games
    a. Types of user interface
    b. Qualities of a good user interface
    c. Localization
    d. Sprites, Heads Up Display (HUD)

- **Game Animation**

9. Game Narrative
    a. Linear and non-linear narrative structures
    b. Designing game narrative
    c. Non Linear Story Telling
10. Intellectual Property Protection for Video Games
    a. Trademarks
    b. Copyrights
    c. Patents
    d. Trade Secrets
11. Game Analysis
    a. Game Analysis of any classic game like Tetris
    b. Game Analysis of any current popular game
    c. Game Analysis of any current popular mobile game or app

- Game (or Apps) Development for various platforms like Mobile, Tablet, PC, Console etc. using any Game Engine Software (example Unreal Editor or Unity)

+Students have to opt for 1 animation elective courses for II semester.
*The elective courses will be offered based on the availability of the faculty and number of students opting for the course.

Evaluation
Total Marks: 100
Internal Assessment: 25
End-Semester Examination: 75

SYLLABUS
Introduction to South Indian Cinema
Semester-I (2015)

Course Objectives:

- The aim of the course is to introduce students to the four major film industries in South India.
- To introduce students to the new areas of research on South Indian Cinema.
- This course will focus not only the historical part, but also the craft of filmmaking, technology; fan clubs, stardom, cine politics, themes, etc. are some of the important areas that the course will offer.

Unit-I: Introduction to South Indian Cinema

Brief history of Telugu, Tamil, Malayalam and Kannada film industries
Features of the four Industries
Introduction to Industry-Film making, Distribution and Exhibition

Unit-II: Genres of South Indian Cinema

Socials, Bhakti, Mythological, Melodrama,
Caste based cinema, Naxalite cinema etc.
Changing trends in Genres-dubbing, remake, overseas audience

Unit-III: Cine-Politics

Film stars and political existence
NTR to Chiranjeevi
Rajkumar
M.G.R, Jayalalitha to Vijayakanth

Unit-IV: Fans, Fan clubs and Stardom

The Star system in South Indian Cinema
Importance of Fans and Fan clubs
The ecosystem of Fan clubs
The changing trends in Fan clubs

Assessment			CREDITS
	Marks	**Total Marks**	
Internal Assessment:			**4**
Seminar	10	25	
Research essay	15		
Semester end examination	75	75	
		100	

List of Suggested Reference Material*:

Ashish Rajadhyaksha, P. W. (1999). *Encyclopedia of Indian Cinema.* Routledge.
Baskaran, S. T. (2008). *Sivaji Ganesan:The legends of Indian cinema.* Wisdom Tree.
Baskaran, S. T. (2013). *The Eye of the Serpent: An Introuduction to Tamil Cinema.* India: Tranquebar.
Bhaskaran, G. (2010). *Adoor Gopalakrishnan: A Life In Cinema.* India: Penguin .
Dickey, S. (1993). *Cinema and the Urban Poor in South India (Cambridge Studies in Social and Cultural Anthropology).* Cambridge University Press .
Nalini Shivkumar, R. M. (2015). *Unforgettable: The Iconic Women of South Indian Cinema.* India: Rupa & Co.
Pandian, M. (1992). *The Image Trap: M.G. Ramachandran in Film and Politics.* India: SAGE Publications Pvt. Ltd.
Pillai, & T., M. (2010). *Women in Malayalam Cinema: Naturalising Gender Hierarchies.* Orient Blackswan.
Pillai, S. E. (2015). *Madras Studios: Narrative, Genre, and Ideology in Tamil Cinema.* New Delhi: SAGE Publications Pvt. Ltd.
Prasad, M. M. (2014). *Cine-politics: Film Stars and Political Existence in South India.* New Delhi: Orient Blackswan.
Rajkumar, P., & Banwasi, P. N. (2012). *Dr. RAJKUMAR The Person behind the personality.* PARVATHAMMA PUBLICATIONS .
S.V.Srinivas. (2013). *Politics as Performance: A Social History of the Telugu Cinema* . Bangalore: Permanent Black.
Sengupta, S., & Reitano, N. (2015). *Discovering Indian Independent Cinema: The Films of Girish Kasaravalli.* CreateSpace Independent Publishing Platform.
Vaasanthi. (2008). *Cut-outs, Caste and Cine Stars: The World of Tamil Politics.* India: Penguin Books .
Velayutham, S. (2008). *Tamil Cinema: The Cultural Politics of India's other Film Industry (Media, Culture and Social Change in Asia Series).* India: Routledge.

*** The lists of reading references above are for those who wanted to purse the subject further. Reading specific for each topic will be provided to students separately.**

M.Sc. IN MATHEMATICS EDUCATION

SYLLABUS

Basic Gaming

CODE NO - MVE- 208 – PAPER NO.- MVE- 13 : Basic Gaming

- Introduction to Gaming
- Game Concept and simple game creation
- E Card
- Flash Game
- Mobile Game

Evaluation

Total Marks: 100

Theory Examination : 75

Internal Assessment : 25

M.A. DEVELOPEMNT COMMUNICATION
&
M.Sc. IN MATHEMATICS EDUCATION

SYLLABUS

MDC10-Social Development

Unit1: Nature of Communities

- Types of Communities: tribal, religious, minorities, rural, urban and Dalits
- Challenges and issues in communities

Unit 2: Demographic profile

- Country profile
- Population
- Literacy
- Focused state and their challenges

Unit3: Social Development Programmes

- NRHM,SSA,ICDS,MREGA,NSA and others
- State health society
- Role of Communication in addressing Development programmes

Total marks: 100

- **Theory : 75**
- **Internal Assessment : 25**

M.A. DEVELOPEMNT COMMUNICATION
&
M.Sc. IN MATHEMATICS EDUCATION

SYLLABUS

MDC10-Social Development

Unit1: Nature of Communities

- Types of Communities: tribal, religious, minorities, rural, urban and Dalits
- Challenges and issues in communities

Unit 2: Demographic profile

- Country profile
- Population
- Literacy
- Focused state and their challenges

Unit3: Social Development Programmes

- NRHM,SSA,ICDS,MREGA,NSA and others
- State health society
- Role of Communication in addressing Development programmes

Total marks: 100

- **Theory : 75**
- **Internal Assessment : 25**

Assessment/Marks:

Internal Assessment: 25

Final Theory Examination: 75

Total Maximum marks: 100

Readings:

- Film Art: An Introduction 10th Edition by Bordwell and Thompson, 2012
- Ways of seeing by John Berger, 1972
- Understanding Movies by Louis Gianetti, 13th edition , 2013

Intensive English Communication: an interactive approach
Course offered under CBCS

Objectives-
This course aims to fill the gaps in the betterment of a learner's effective communication in English, whatever be the situation he/she may find him/her self in. Language learning in the classroom varies from actual language used in the street or in other everyday activities, outside the classroom (in the real world).
This course aims to provide opportunities to learners, to activate their passive skills and to help them reach their goals in communicating effectively in English.

Course instructor: Dr. Shubhada KAUL.

Speaking and Oral Comprehension-

i - use of authentic audio texts for the purpose of understanding them and being able to answer questions based on those texts, that could be asked.
ii - active and passive skills
iii - what to look out for.....

Clues, Cues and Coping Strategies-

i - accents, regional variations with specific references to Indian English
ii - listening- a much neglected skill; reading – another much neglected skill.....
iii - learner's expressions/output

Writing Skills-

i - how to write effectively
ii - task based skill

Evaluation- internal assessment = 25 &
end semester examination = 75 marks.

References & Reading Material-
a-www.esl-lounge.com/level1.....level2.....etc....
b-http://www.teachingenglish.org.uk/
c-http://www.esl-galaxy.com
d-http://www.icte.uq.edu.au.

other materials will be provided as needed.

-21-

Scheme of Examination
for
Meta University Concept based course

M. Sc. (Mathematics Education)

1. Combined semester-wise result of the Meta University concept course M. Sc. (Mathematics Education) would be declared on the basis of marks system as per details given in this document.

2. For every paper studied under Meta University concept course M. Sc. (Mathematics Education) at University of Delhi and at Jamia Millia Islamia, the total marks and breakup of marks for Theory Paper and for Internal Assessment along with pass percentage during four semesters is as given in the table below.

3. For every innovation project / project work done in a paper, the marks system of this component will be as given in the table below.

Note
The examination for papers studied by students at JMI will be conducted at JMI. *
The examination for papers studied by students at DU will be conducted at DU.

Declaration of semester-wise result and issuing of Mark-sheets carrying logo of both DU and JMI shall be the responsibility of Examination Branch University of Delhi.

* JMI examination branch will provide result of these papers to DU.

Semester I

S. No.	Paper Title	Offering Centre	Credits	Total Marks	Marks Breakup	Pass Percentage
I.1	Calculus: Role in real life	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
I.2	Perspectives in Mathematics Education	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
I.3	Paper option 1 from JMI*	AJKMCRC, JMI	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
I.4	Paper option 2 from JMI*	AJKMCRC, JMI	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
I.5	Innovation Project-I: Interlinking mathematics & real world problems	CIC,DU/JMI	**8**	**200**		**40% in Total**
		Total	**24**	**700**		

Semester II

S. No.	Paper Title	Offering Centre	Credits	Total Marks	Marks Breakup	Pass Percentage
II.1	Demystifying the power of data: Probability & Statistics	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
II.2	Curriculum and Evaluation in Mathematics	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
II.3	ICT in Mathematics Education	CIC,DU	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
II.4	Learning ways of Mathematical writing	CIC,DU	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
II.5	Innovation Project-II: Internship in Educational setting-I	CIC,DU/JMI	**8**	**200**		**40% in Total**
		Total	**24**	**700**		

Semester III

S. No.	Paper Title	Offering Centre	Credits	Total Marks	Marks Breakup	Pass Percentage
III.1	Discretizing and understanding Real Life Situations Through a Mathematical Lens	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
III.2	Art of Teaching Mathematics	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
III.3	Digital Technology in Mathematics Education	CIC,DU	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
III.4	Research Methodology in Education	CIC,DU	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
III.5	Innovation Project-III: Internship in Educational Setting-II	CIC,DU/JMI	**8**	**200**		**40% in Total**
			24	**700**		

Semester IV

S. No.	Paper Title	Offering Centre	Credits	Total Marks	Marks Breakup	Pass Percentage
IV.1	Understanding mathematical language of ordinary differential equations and complex analysis	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
IV.2	Research Investigation in Mathematics Education	CIC,DU	**5**	**150** A . Theory 100 B . Project 50	A. Written 75 IA 25	**40% in Total** A. 40% in written 40% in Total B. 40% in Project
IV.3	Paper option 3 from JMI*	AJKMCRC, JMI	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
IV.4	Paper option 4 from JMI*	AJKMCRC, JMI	**3**	**100**	Written 75 IA 25	**40% in Total** 40% in Written
IV.5	Innovation Project-IV: Research Dissertation	CIC,DU/JMI	**8**	**200**		**40% in Total**
			24	**700**		

* List of papers to be opted from JMI

1. English for Media Communication
2. Advertising
3. Contemporary India and the World We Live in
4. Development Journalism
5. Media Management
6. Public Relations and Corporate Communication
7. Media Laws and Ethics
8. Mass Communication Theory
9. Media Research

Note:

The decision to offer two or three specific papers from amongst the above-mentioned papers or any other course approved by Academic Council of JMI varies from semester to semester. Syllabus of the papers to be opted from JMI presently is as per approved syllabi of AJKMCRC.

Approved Examination Seven Digit Paper codes for Meta University Course M. Sc. (Mathematics Education) by Examination Branch, University of Delhi

- University Code : 1for DU, 2 for JMI
- Department code for Cluster Innovation Centre (CIC) : 91
- Course code for M.Sc. (Mathematics Education) : 3
- Semester codes for M.Sc. (Mathematics Education) : 1/2/3/4
- Paper codes for papers offered by University of Delhi : 01 to 10
- Paper codes for papers offered by Jamia Millia Islamia : 01 to 12

Detailed approved examination codes for papers offered by University of Delhi since July 2014:

Paper Title	Semester	Offering University	Approved Examination Code
Calculus: Role in real life	I	DU	1913101
Perspectives in Mathematics Education	I	DU	1913102
Innovation Project-I: Interlinking mathematics & real world problems	I	DU	1913103
Demystifying the power of data: Probability & Statistics	II	DU	1913201
Curriculum and Evaluation in Mathematics	II	DU	1913202
ICT in Mathematics Education	II	DU	1913203
Learning ways of Mathematical writing	II	DU	1913204
Innovation Project-II: Internship in Educational setting-I	II	DU	1913205
Discretizing and understanding Real Life Situations Through a Mathematical Lens	III	DU	1913301
Art of Teaching Mathematics	III	DU	1913302
Digital Technology in Mathematics Education	III	DU	1913303
Research Methodology in Education	III	DU	1913304
Innovation Project-III: Internship in Educational Setting-II	III	DU	1913305
Understanding mathematical language of ordinary differential equations and complex analysis	IV	DU	1913401
Research Investigation in Mathematics Education	IV	DU	1913402
Innovation Project-IV: Research Dissertation	IV	DU	1913403

Detailed approved examination codes for papers offered by University of Delhi up to June 2014:

Seeing the world through calculus: First Steps	I	DU	1913104
School Curriculum, Concept, Processes and Assessment	I	DU	1913105
Innovation project-I.5	I	DU	1913106
Does Nature play dice?: The amazing world of probability and statistics	II	DU	1913206
Mathematics, Curriculum, Pedagogy and Evaluation	II	DU	1913207
English Language Proficiency Course: Basic/Intermediate	II	DU	1913208
Innovation Project-II.4	II	DU	1913209
Discretizing and understanding Real Life Situations Through a Mathematical Lens	III	DU	1913309
English Language Proficiency Course: Intermediate/Advanced Level	III	DU	1913306
Creativity in the Digital World: Graphics & Multimedia	III	DU	1913307
Innovation project III.4	III	DU	1913308
Modeling continuous change through ordinary differential equations and complex analysis	IV	DU	1913404
Understanding Economic Behaviour: The Macro Level	IV	DU	1913405
Innovation project IV.5	IV	DU	1913406

Detailed approved examination codes scheme for optional papers offered by Jamia Millia Islamia:

(Represents options 01 to 12)**

Sem	Paper Title	Offering University	Proposed Examination Code
I	To be opted from list given below	JMI	29131**
I	To be opted from list given below	JMI	29131**
IV	To be opted from list given below	JMI	29134**
IV	To be opted from list given below	JMI	29134**

List of the papers offered by Jamia Millia Islamia and detailed approved examination codes:

S. No.	Paper Title	Offering University	Code for semester I	Code for semester IV
1.	English for media communication	JMI	2913101	2913401
2.	Advertising	JMI	2913102	2913402
3.	Contemporary India and the world we live in	JMI	2913103	2913403
4.	Development Journalism	JMI	2913104	2913404
5.	Media Management	JMI	2913105	2913405
6.	Public Relations and Corporate Communication	JMI	2913106	2913406
7.	Media Laws and Ethics	JMI	2913107	2913407
8.	Mass Communication Theory	JMI	2913108	2913408
9.	Media Research	JMI	2913109	2913409
10.	Advanced Gaming and Animation Scripting	JMI	2913110	2913410
11.	The Science of Screenplay Writing & Production	JMI	2913111	2913411
12.	Advertising Communication: Process & Planning	JMI	2913112	2913412
13.	Street Theater	JMI	2913113	2913413
14.	Puppetry	JMI	2913114	2913414
15.	Gaming and Animation Scripting	JMI	2913115	2913415
16.	Introduction to South Indian Cinema	JMI	2913116	2913416
17.	Basic Gaming	JMI	2913117	2913417
18.	Social Media for Development Communication	JMI	2913118	2913418
19.	Film Appreciation	JMI	2913119	2913419
20	Intensive English Communication	JMI	2913120	2913420

Promotion Scheme for M.Sc. (Mathematics Education)

(i) General Rules:

1. A student shall earn full credits for a paper if she/he passes the paper and shall earn no credit if she/he fails in the paper.
2. All students shall be promoted from first to second semester irrespective of their performance in first semester. Similarly, all students shall be promoted from third to fourth semester irrespective of their performance in third semester.
3. A student shall be eligible for promotion from 1st year to 2nd year (third semester) provided she/he has passed five out of ten papers. (i.e. minimum 50% of the papers)
4. A student not eligible for promotion from 1st year to 2nd year (third semester), however, shall retain her/his marks secured in papers she/he passed and that of Internal assessment only in papers she/he has not passed.
5. If a student fails in an Innovation Project paper, she/he has to either redo the project or carry out a new project.
6. A student will be given a maximum of three chances in total to pass a paper as and when that paper's examination takes place within three years of his first appearance in the examination of that paper.
7. No supplementary examination shall be conducted.
8. A student shall be awarded the degree only if he/she passes in all the papers.
9. Grand Total of marks of all four semesters is 2800. A student shall be awarded first division if she/he secures 60% or more marks in aggregate. A student shall be awarded second division if she/he secures marks between 50% or more marks but less than 60% in aggregate. A student shall be awarded third division if she/he secures marks between 40% or more marks but less than 50% aggregate.

(ii) Reappearance in passed papers:

1. A student may reappear in any theory paper prescribed for a semester, on foregoing in writing her/his previous performance in the paper/s concerned. This can be done in the immediate subsequent semester examination only. The result for this paper will be revised incorporating current performance.
2. In the case of a candidate, who opts to re-appear in any paper/s under the aforesaid provisions on surrendering her/his earlier performance, but fails to reappear in the paper/s concerned, the marks previously secured by the candidate in the paper/s in which she/he has failed to re-appear shall be taken into account while determining her/his result of the examination held currently.
3. A student who reappears in a theory paper shall carry forward the internal assessment and project/practical marks, originally awarded in that paper.
4. Reappearance in a passed Innovation project paper shall not be allowed.

(iii) Attendance Requirements

1. For papers studied at University of Delhi, student shall have to fulfill the attendance rules of University of Delhi.
2. For papers studied at Jamia Milia Islamia, student shall have to fulfill the attendance rules of Jamia Millia Islamia

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