

M.Sc., M.Ed. (Mathematics) Syllabus

$$1/4 = 1/1 - 1/3 + 1/5 - 1/7 + \dots$$

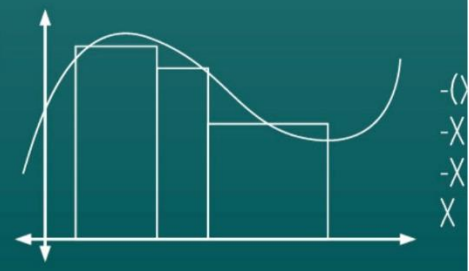
$$1. \quad |-A| = |A|$$

$$\text{GAMMA} = - \int_0^{\infty} e^{-x} \ln x \, dx$$

$$E = (1/3) B H = 1/3 \pi R^2 H$$

$$2. \quad |A| \geq 0$$

$$|-23| + |4|$$



ABSOLUTE VALUE

$$(N \ 0)B^0 + (N \ 1)B^1 + (N \ 2)B^2$$

$$3) \quad \pi R^1 R^2 R^3$$

$$\text{PYRAMID} = (1/3) B H$$

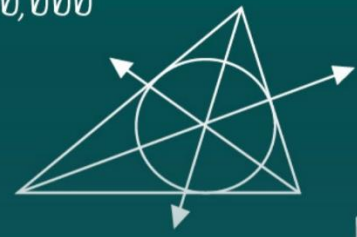
$$4 \times \pi \times R^2$$

$$A+B = C$$



$$L=50,000$$

$$99 = \text{XCIX}$$



$$\text{GAMMA}(X+1) = X \text{ GAMMA}(X)$$

$$= C E R T$$

$$|A - B| \geq |A| - |B|$$

$$B = A (1 + R/N)^{NT - P}$$

$$(1/2) D T$$

$$V=5,000$$

$$\text{GAMMA}(X) = R X (\int_0^{\infty} e^{-RT T} (X-1) DT)$$

$$|-A| = |A|$$

$$P = C (1 + R) T$$



$$|A| \geq 0$$

$$2/\pi = \sqrt{2}/2 * \sqrt{2 + \sqrt{2}}/2 * \sqrt{2 + (\sqrt{2 + \sqrt{2}})}/2 * \dots C$$



॥ न हि ज्ञानेन सदृशं पवित्रमिह विद्यते ॥

**INDIAN INSTITUTE OF TEACHER EDUCATION,
GANDHINAGAR (GUJARAT)**

Indian Institute of Teacher Education

Gandhinagar (Gujarat)

Regulations for M.A. M.Ed./M.Sc. M.Ed. Programme

1 Programme, Duration and its equivalence:

- 1) Programme and Duration: M.A. M.Ed./M.Sc. M.Ed. Programme is an integrated teacher education programme.

M.A. M.Ed. is a postgraduate integrated PG programme and is entitled 'Master in Arts and Master in Education'. This programme is of three years' duration and each year comprises 2 semesters. Each semester consists of 18 weeks of instructions, i.e. 108 instructional days. There shall be 216 days for instruction in a year.

M.Sc. M.Ed. is a post-graduate integrated PG programme and is entitled 'Master in Science and Master in Education'. This programme is of three years' duration and each year comprises 2 semesters. Each semester consists of 18 weeks of instructions, i.e. 108 instructional days. There shall be 216 days for instruction in a year.

- 2) Equivalence:

The programme contents related to M.A., M.Ed. is equivalent to PG Programme in Arts and equivalent to M.A. degree and M. Ed. is Masters in Education equivalent to M.Ed. degree.

The programme contents related to M.Sc., M.Ed. is equivalent to PG Programme in Science and equivalent to M.Sc. degree and M.Ed. is Masters in Education equivalent to M.Ed. degree.

Students who pass this programme are considered eligible to pursue Research Studies in Education in the Centre of Education of Indian Institute of Teacher Education and also eligible for Ph.D. in relevant subject at the centres specified by University.

3 Eligibility for admission to M.A., M.Ed./M.Sc., M.Ed.

Eligibility for admission to M.A., M.Ed.

The candidates seeking admission to the M.A., M.Ed. programme should have passed following Examinations from the IITE or any of the universities recognised by UGC.

B.A., B.Ed. from IITE, or

Graduate in any of the subjects of Arts discipline and B.Ed.

- 2.1 Eligibility for admission to M.Sc., M.Ed.
The candidates seeking admission to the M.Sc., M.Ed. programme should have passed following Examinations from the IITE or any of the universities recognised by UGC.

B.Sc., B.Ed. from IITE, or

Graduate in any of the subjects of Science Faculty and B.Ed.

Admission to the Course

There shall be pre-entry test for the course and merit shall be prepared as per the norms regulated by university time by time.

- 4) Scheme of Instruction:
There will be six semesters and students will have to learn following subjects in two broad areas of curriculum in Education.

PG Course in respective academic programme, and

PG Course in Teacher Education

Details of courses and scheme of study, duration, etc. are annexed herewith in Annexure-1.

- 7) PG Course in respective academic programme

There are two basic PG Academic Programmes and they are M.A. and M.Sc. The following subjects shall be offered in these two categories; they are:

English (M.A.),
Botany (M.Sc.),
Chemistry (M.Sc.),
Maths (M.Sc.), and
Physics (M.Sc.)

There are three categories of courses being offered and title of the papers are annexed herewith in Annexure: 2.

Core Compulsory: There are 16 Core Compulsory Courses in each.

Core Optional: There are 8 Core Optional Courses in each and student has to opt any of the 4 courses.

Innovation in Research: There are courses of 16 credits leading to subject specific dissertation.

- 3.2 PG Course in Teacher Education
PG Course in Teacher Education is integrated teacher education programme leading to PG Degree of M.Ed.

There are four categories of courses being offered and title of the papers are as under.

3.2.1 Core Compulsory

1. Methods of Education Research-1
2. Methods of Education Research-2
3. Psychological Foundations of Education-1
4. Psychological Foundations of Education-2
5. Philosophical Foundations of Education
6. Sociological Foundation of Education
7. ICT in Education
8. Teachers Education
9. Principles and Techniques of Learning
10. Principles and Techniques of Teaching
11. Psychological Testing

3.2.2 Core Optional

1. Measurement and Evaluation
2. Educational Management
3. Yoga Education
4. Guidance and Counselling
5. Educational Statistics
6. Curriculum Development

3.2.3 Core Practicum

1. Preparing Theme Papers and its Presentation
2. Administration of Psychological Tests and Preparation
3. Presentation of Teaching Learning Material
4. Internship

3.2.4 Core Research Studies

Dissertation

4.0 Attendance

Every student has to attend a minimum of 80% of the classes conducted of each course. If a candidate has failed to put in a minimum of 80% attendance in a course, he is deemed to have dropped the course and is not allowed to write the semester end examination of that course. He has to attend the classes of that course in the subsequent years whenever it is offered.

The vice-chancellor has discretionary powers to condone attendance if he feels that such absence was due to unavoidable circumstances and students may make up the study with the help of writing assignments and other curricular activities during holidays or weekends of the semester. But in no case such absence would be more than 35 % during each semester.

5.0 Medium of Instruction:

The medium of instruction and examination shall be English.

6.0 Course Structure for Integrated Teacher Education Programme

6.1 Course Structure of M.A., M.Ed. - Indian Institute of Teacher Education

7.0 Assessment and Evaluation: CCE (Continuous and Comprehensive Evaluation):

There will be continuous and comprehensive evaluation for the M.A., M.Ed. /M.Sc. M. Ed. Course. The learners will be evaluated internally as well as externally. As the university has adopted CCE module for the evaluation, the pattern scheme for evaluation will be as under:

7.1 Scheme of Evaluation:

There are two categories for evaluation:

7.1.1 Internal Evaluation: (30 % of Marks)

Internal evaluation will include assignment, project, seminar and test. The ratio of marks will be 1:1:1:3 for each. There will be written submission for assignment and project and seminar will be group activity and participation of learner will be ad-judged by the subject teacher concerned. The detailed Marks statement of each shall be submitted to Examination Section on or before the last day of the respective semester.

7.2.2 External Evaluation: (70 % of Marks)

External evaluation will be semester end examination, theoretically and/or practically as case may be, conducted by the university at the end of each semester.

7.4 Assessment

7.4.1 The following table shows how the marks will be calculated for the final evaluation:

Pa- per/C ode	Credit	Internal Evaluation					External Evaluation			Total	GP	Letter Grade	GPA
		ment/Practical - Assgn	Project	Seminar	Test	Total	Theory	Practical	Total				
	Cr	I01	I02	I03	I04	Int	ETH	EPr	Ext	GrT	GP	GP	
###						=I01+ I02+ I03+ I04		If any	=ETH + EPr			See table below	
						≥ 20			≥ 30	Int+ Ext	GrT/10		=GP x Cr

The student is eligible for Total, if there are more than 20 marks in Internal and 30 marks in External Evaluation.

7.4.2 Conversion to GP and letter Grade

Marks in Percentage	GP	Explanation	Grade
85 and Above	8.5-10	Outstanding	O +
70-84	7-8.4	Excellent	O
60-69	6-6.9	Very Good	A
55-59	5.5-5.9	Good	B +
50-54	5-5.4	Fair	B
40-49	4-4.9	Average	C
0-39	0 -3.9	Dropped	D

7.4.7 Final Result

Marks in Percentage	Grade	Result
85 and Above	O +	First class with Distinction
70-84	O	
60-69	A	First Class
55-59	B +	High Second Class
50-54	B	Second Class
36-49	C	Pass Class
0-35	D	Dropped

7.4.8 CGPA

Cumulative Grade Point Assessment (CGPA) will be average SGPA of the all six semesters and Final Degree will awarded on the basis of CGPA.

7.4.9 Examinations

7.4.9.1 There shall be examinations at the end of each semester, for odd semesters (i.e., I, III and V Semesters) after end of respective semesters; for even semesters (i.e., II, IV and VI Semesters) after end of respective semesters. Any candidate who fails to clear any of the examinations may take subsequent examination to be held as per regulations.

7.4.9.2 The candidate will be allowed to keep semesters on until he/she clears pre-ceding semesters of previous year

7.4.9.3 The candidate will be allowed to attempt twice after completion of the third year of the M.A., M.Ed./M.Sc. M.Ed. Course. It means student will be allowed two more years for clearing all semesters which are not cleared in last four semesters of the course if he/she is not detained earlier.

If any of the students is detained earlier may not get opportunity of two at-tempts; those who are detained once will have one more year to clear and those who are detained twice will have no more attempts to clear them.

The Vice-chancellor of the University on his/her sole discretion may allow any of the students who have been given more two chances as per the regulations, one more year to clear courses on request satisfying him the reasons for not clearing examinations for said course.

Annexure: Format of question paper

Indian Institute of Teacher Education, Gandhinagar

Semester-End Examination

May 20- .

Semester: .

Subject:

Course Name:

Date:

Total Marks: 70

Time:

Note: All the questions are compulsory and carry equal marks.

Specify your option/s clearly.

Q:1 Answer following questions. (Short Answer Questions)

14

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.

(Equal weightage should be given to all units)

Q: 2 Answer following question in 800 words only:

14

(From Unit I, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

OR

Q: 2 Answer following question in 800 words only:

(From Unit I, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

Q: 3 Answer following question in 800 words only:

14

(From Unit II, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

OR

Q: 3 Answer following question in 800 words only:

(From Unit II, paper setter may frame one question or two questions of 6 marks each. For 7 marks question word limit is 400 words)

Q: 4 Answer following question in 800 words only:

14

(From Unit III, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

OR

Q: 4 Answer following question in 800 words only:

(From Unit III, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

Q: 5 Answer following question in 800 words only:

14

(From Unit IV, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

OR

Q: 5 Answer following question in 800 words only:

(From Unit IV, paper setter may frame one question or two questions of 7 marks each. For 7 marks question word limit is 400 words)

Annexure 2: General Layout of the Papers/Courses Offered

Paper No	Botany	Chemistry	Maths	Physics	English		Nature of Course	Credits
21001	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21002	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21003	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21004	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21005	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21031	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
22006	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22007	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22008	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22009	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22010	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22032	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
23011	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
23012	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
23113	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
23213	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
23033	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
24014	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
24015	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
24116	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
24216	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
24034	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
25017	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
25118	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
25218	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
26019	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
26120	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
26220	21001BIO	21001CHE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
Total Credits								96

M.Sc. (Maths), M.Ed.

Sr. No	se- mest er	Paper No.	Theory & Tutorial-or- Practical	Title of Paper/course	Credit	To be In- cluded as core/ Elective	Marks for Evalua- tion	
							Inter- nal	Exter- nal
1	I	2110104MAT	Theory & Practical	Abstract Algebra -1	4	Core	30	70
2		2110204MAT	Theory & Practical	Real Analysis	4	Core	30	70
3		2110304MAT	Theory & Practical	Complex Analysis	4	Core	30	70
4		2110404MAT	Theory & Practical	Advance Linear Algebra	4	Core	30	70
5		2110504MAT	Theory & Practical	Advanced Latex Programming	4	Core	30	70
6		2110604MAT	Theory & Practical	Foundation course in Mathematical sciences-1	4	Core	30	70
7	II	2210704MAT	Theory & Practical	Ordinary Differential Equations	4	Core	30	70
8		2210804MAT	Theory & Practical	Combinatorics &Graph Theory	4	Core	30	70
9		2210904MAT	Theory & Practical	Topology	4	Core	30	70
10		2211004MAT	Theory & Practical	Number Theory	4	Core	30	70
11		2211104MAT	Theory & Practical	Introduction to Scilab	4	Core	30	70
12		2211204MAT	Theory & Practical	Foundation course in Mathematical sciences-2	4	Core	30	70
13	III	2311304MAT	Theory & Practical	Mathematical Modelling	4	Core	30	70
14		2311404MAT	Theory & Practical	Programming in "C"	4	Core	30	70
15		2311514MAT	Theory & Practical	Abstract Algebra-2	4	Elective	30	70
16		2311524MAT	Theory & Practical	Functional Analysis	4	Elective	30	70
17		2311604MAT	Theory & Practical	Foundation course on research in Mathemati- cal sciences-3	4	Core	30	70
18	IV	2411704MAT	Theory & Practical	Statistical Methods	4	Core	30	70
19		2411804MAT	Theory & Practical	Introduction to Python	4	Core	30	70
20		2411914MAT	Theory & Practical	Operation Research	4	Elective	30	70
21		2411924MAT	Theory & Practical	Introduction to Coding theory &Cryptography	4	Elective	30	70
22		2412004MAT	Theory & Practical	Foundation course on research in Mathemati- cal sciences-4	4	Core	30	70
23	V	2512104MAT	Theory & Practical	Calculus of variation & Integral Equation	4	Core	30	70
24		2512214MAT	Theory & Tutorial	Mechanics	4	Elective	30	70
25		2512224MAT	Theory & Practical	Relativity	4	Elective	30	70
26	VI	2612304MAT	Theory & Tutorial	Discrete Mathematics	4	Core	30	70
27		2612414MAT	Theory &Practical	Mathematical Methods	4	Elective	30	70
28		2612424MAT	Theory &Practical	Partial Differential Equation	4	Elective	30	70



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed.
Semester-I
Paper No: 1110100
Compulsory

Subject: Education **Credit:4**
: Title of the paper:
Methods of Research in Education-1

Objective of the course:

- Explain the meaning, characteristics and steps of research
- Present various types of researches and sources and library skills
- Enlist criteria and sources for selection of research problem
- Explain operational definition, variable and hypothesis
- Prepare research proposal
- Develop various types of tools
- Explain various sampling techniques

Unit	Sub Unit	Content	Credit								
1	1.0	Concept Of Educational Research	1								
	1.1	Meaning, characteristics Education Research, Steps of the research process									
	1.2	Types of research: (a) Basic, Applied and Action research (b) Qualitative and Quantitative research									
	1.3	Areas of educational research									
	1.4	Types of sources									
	1.5	Library skill? Reading skill and note taking skill									
2	2.0	Selection Of The Research Problem And Concept Of Variables And Hypotheses	1								
	2.1	Criteria for selection of research problem and sources									
	2.2	Defining operationally the related terms of research problem									
	2.3	Meaning and Types of variables									
	2.4	Meaning and Types of hypothesis									
	2.5	Bases for hypothesis construction									
3	3.0	Tools Of Research	1								
	3.1	Psychological Test: (a) types and its uses (b) construction procedure									
	3.2	Questionnaire: (a) types, format and guidelines for questions and questioner ?, (b) advantages and disadvantages									
	3.3	Interview : (a) types of interview such as individual and group, structured and unstructured (b) Administration of interview									
	3.4	Rating Scales: types, format and guidelines for constructing Rating Scales									
	3.5	Measurement of Attitude: Thurston and likert technique us meaning of checklist, Q-sort and semantic differential									
	3.6	Standardization of research tools: Reliability, Validity and Norms									
4	4.0	Sampling Techniques	1								
	4.1	Meaning of population and sample									
	4.2	Importance of sampling									
	4.3	Characteristics of a good sample									
	4.4	Sampling Technique: (a) Probability Sampling: Simple random sampling, stratified random sampling, systematic sampling, cluster sampling (b) Non-probability sampling: incidental Sampling, purposive sampling, quota sampling.									
Assessment & Evaluation	Credit	Internal	External								
			Sem. End Exam								
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	Total O/o
	4	0	5	5	5	15	30	70	0	70	70



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed.

Semester-I

Paper No: 1110100

Compulsory

Subject: Education

Credit:4

: Title of the paper:

Methods of Research in Education-1

REFERENCE BOOKS:

English

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Gujarati

- 1 ઉચાટ, ડા.અ. અને અન્યા (સ) (૨૦૦૬) શિક્ષણ સંશોધનના સારાંશ (૧૯૭૮-૨૦૦૬) રાજકોટ: શિક્ષણશાસ્ત્ર ભવન, સૌરાષ્ટ્ર યુનિવર્સિટી
- 2 ત્રિવેદી, અમ.ડા. અને પારખ, બા.યુ. (૧૯૮૯) શિક્ષણમાં આકાશશાસ્ત્ર, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- 3 દેસાઈ, અ.યુ.જી. અને દેસાઈ, ક. જી. (૧૯૯૭) સંશોધન પદ્ધતિઓ અને પ્રાવેશિકા, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- 4 દેસાઈ, અ.યુ.જી. અને દેસાઈ, ક. જી. (૧૯૯૪) મનોવેજ્ઞાનિક માપન, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- 5 પટલ આર. અસ. (સ) (૨૦૦૮) અમ.અ.ડ. લઘુશાધ નિબંધના સારાંશ: અમદાવાદ, જય પબ્લીકેશન.
- 5 માદા, ડા.જ. અને અન્યા (૧૯૯૧) સંશોધનના માધુકર, ભાવનગર શિક્ષણશાસ્ત્ર ભવન, ભાવનગર યુનિવર્સિટી
- ૭ શાહ, દે.પા.કા. બા. (૨૦૦૪) શિક્ષણ સંશોધન, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.M.Ed.</p> <p style="text-align: center;">Semester-I</p> <p style="text-align: center;">Paper No: 1110200</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education</p> <p style="text-align: right;">Credit: 2</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Yoga Studies</p>
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Objective of the course:

- To enable the students to understand the philosophy of yoga.
- To enable the students to understand the various types of asanas and its importance.

Unit	Sub Unit	Content	Credit									
1		<p>Yoga-It's Philosophy</p> <ul style="list-style-type: none"> • Introduction and Meaning of yoga • Brief History of yoga • Importance of yoga • Effect of yoga on body and Daily routine of a healthy person. 	0.5									
2		<p>Astang yoga: First four limbs</p> <ul style="list-style-type: none"> • Yama (The five "abstentions"): Ahimsa (non-violence), Satya (Truth, non-lying), Asteya (non-covetousness), Brahmacharya (non-sensuality, celibacy), and Aparigraha (non-possessiveness). • Niyama (The five "observances"): Shaucha (purity), Santosha (contentment), Tapas (austerity), Svadhyaya (study of the Vedic scriptures to know about God and the soul), and Ishvara-Pranidhana (surrender to God). • Asana: Literally means "seat", and in Patanjali's Sutras refers to the seated position used for meditation. • Pranayama ("Suspending Breath"): <i>Prāna</i>, breath, "āyāma", to restrain or stop. Also interpreted as control of the life force. 	0.5									
3		<ul style="list-style-type: none"> • Astang yoga • Second four limbs • -Pratyahara ("Abstraction"): Withdrawal of the sense organs from external objects • -Dharana ("Concentration"): Fixing the attention on a single object. • -Dhyana ("Meditation"): Intense contemplation of the nature of the object of meditation. • -Samadhi ("Liberation"): merging consciousness with the object of meditation • Relevance of Asthanga yoga. 	0.5									
4		<ul style="list-style-type: none"> • YOG PRACTICES (PRACTICAL) • Pranayams: Bhastrika, anulom-vilom, kapalbhati, bahya, agnisar, bramri, udgit, ujjai shitli, sitkari, nadisodhan, karnogantak, surya bhedi, chandra bhedi etc.) • Asanas; • Standing postures : ga rudasan, trikonasan, dhruvasan, natrajasan. • Sitting postures : yogmudrasan, baudhpadmasan, va krasan, ardhamasendrasan, vajrasan, kukutasan, sidhasan, kapotasan, marjarasan • Prone Posture: naukasan(viprit), bhekasana, dhanurasan, salbhasan, bhujangasan • Seepine posture: Naukasan, sarvangasan, halasan, matsyasan, vipritkarni Suryanamaskar • Relaxation exercises and savasan is compulsory between and end of session. 	0.5									
Assessment & Evaluation		Credit	Internal					External			Total	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		0	2	5	5	5	15	30	Theor	Practical		Total
								35	35	70	70	

REFERENCE BOOKS:

Human physiology and sports science: Dr pradhuman bhatt.
 Exercise physiology: Shree K.R. PATEL
 Yoga its philosophy and practice: Swami Ramdev
 Stress management through yoga : Bharat Thakur
 Pranayama Rahasya : Swami Ramdev
 Aushadh darsan : Swami Ramdev
 Rajrshi muni : Yoga Darshika
 Maharshi Arvind : soul development through yoga, www.pathofdivinelife.org
 Yoga –Its philosophy & Practice - Swami Ramdev
 Yoga dipika - Dr. A.K. Ayanger



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc. M.Ed. Semester-I Paper No:2110104 Compulsory</p>	<p style="text-align: center;">Subject: Mathematics</p> <p style="text-align: center;">: Title of the paper: Abstract Algebra -1</p>	<p>Credit: 4</p>
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Objective of the course:

1. To Understand basics of abstract algebra, including binary operations, groups, subgroups, etc.
2. To Develop the skills of solving problems about the size and composition of Groups.
3. To acquire Knowledge of fundamental theorems of Abstract Algebra.
4. To Apply the knowledge of the fundamental properties of abstract algebraic structures, their substructures, their quotient structure, and their mappings.

Unit	Sub Unit	Content	Credit
1		Revision: Group, Sub group, Normal Subgroups, Quotient groups, Homomorphism of groups, Isomorphic groups, Automorphisms, permutation group, direct product of group, Cayley's theorem, conjugacy relation on group and its applicants, solvable group, Alternating groups.	1
2		Group actions, sylow's theorem, finite abelian groups, Simple group, Finitely Generated Abelian Groups, Invariants of a finite abelian Groups.	1
3		Ring, Sub Rings, ring homeomorphisms, ideals and quotient rings, prime and maximal ideals, Ideals, Homomorphisms, Sum and Direct Sum of Ideals, Maximal and Prime Ideals, Nilpotent and Nil Ideals.	1
4		Practical: Based on (1) Testing Various Properties of different groups, Isomorphism of groups, Homomorphism of groups, permutation group & Abelian group. (2) Verifying the Theorems on different algebraic groups, Isomorphism of groups, Homomorphism of groups & Abelian groups. (3) Testing Properties of various rings and fields. (4) Verifying the theorems on ring, field. (5) Creating the examples for given condition for group, ring & Ideals.	1

Assessment & Evaluation	Credit		Internal					External			Total O / o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

- 1) Algebra by M. Artin, Prentice-Hall of India Private Ltd., New Delhi, 1994.
- 2) Algebra Volume 1 by P.M. Cohn, John Wiley Pub., New York, 1974.
- 3) Contemporary Abstract Algebra by J. A. Gallian, Fourth Edition, Narosa Publishing House, New Delhi, 1999.
- 4) University Algebra by N. S. Gopalakrishnan, New Age International Private Ltd. Publishers, New Delhi, Sixth Reprint, 1998.
- 5) Topics in Algebra by I. N. Herstein, Second Edition, Wiley Pub., New York, 1975.
- 6) Algebra by T. W. Hungerford, Springer-Verlag, First Indian Reprint, 2004.
- 7) "Basic Abstract Algebra" by Bhattacharya, Jain and Nagpal, 2nd Edition.
- 8) "Algebra" by S. Mcclane and G. Birkhoff, 2nd Edition.
- 9) "Basic Algebra" by N. Jacobson. Hind. Pub. Corp. 1984.



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed. Semester-I Paper No:2110204 Compulsory	Subject: Mathematics : Title of the paper: Real Analysis	Credit: 4
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Objective of the course:

- To Understand fundamental properties of the real numbers.
- To Develop the skills of constructing mathematical proofs in real analysis.
- To Acquire knowledge of Real Analysis.
- To Apply the knowledge of limits in sequences, series, differentiation and integration.

Unit	Sub Unit	Content	Credit
1		Revision: Standard topology on \mathbb{R} , structure of open sets, cantor set, \limsup , \liminf . Cardinality of a set, countable and uncountable sets, Schroder-Bernstein theorem. Relation between cardinality of a set and cardinality of its power set.	1
2		The metric spaces \mathbb{R} and \mathbb{C} , The metric space $C[0,1]$ of bounded continuous functions on the closed and bounded interval $[0,1]$. Open and closed sets in a metric space. Cantor's set, convergence, completeness in metric spaces.	1
3		Cantor's intersection theorem. Continuous mapping in metric spaces. Baire's category theorem. The spaces $C(X, \mathbb{R})$, $C(X, \mathbb{C})$ and l_p . The Heine-Borel theorem, Compactness for metric spaces, Bolzano-Weierstrass property, Lebesgue's covering lemma, Ascoli's theorem. Hausdorff spaces. Connectedness in \mathbb{R} , \mathbb{C} . The Weierstrass Approximation theorem. The Stone-Weierstrass theorem.	1
4		Practical Based on: (1) Creating the examples for given condition. (2) Testing the properties of countable and uncountable Sets, Open and closed sets in a metric space. (3) Verification of theorems.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

- 1) Royden H. L., Real Analysis (Third Edition), Macmillan Publ. Company, New York.
- 2) Rana I. K., An introduction to measure and integration, Narosa Publ. House, New Delhi.
- 3) De Barra G., Introduction to measure theory, Van Nostrand Reinhold Company
- 4) G.F. Simmons : Introduction to Topology and Modern Analysis [McGraw-Hill International Edition (1963)]
- 5) J. F. Randolph: Basic Real and Abstract Analysis.
- 6) Beginning Functional Analysis (Springer International Edition)
- 7) A Course in Calculus & Real Analysis – S. R. Ghorpade & B. V. Limaye.
- 8) Fundamentals of mathematical analysis- G. Das & S Pattanayak, Tata Mcgraw Hill Pub. Co. Ltd.
- 9) Elementary Analysis: the theory of calculus - K. Ross, Springer, India.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-I</p> <p style="text-align: center;">Paper No:2110304</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Mathematics</p> <p style="text-align: right;">Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Complex Analysis</p>
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Objective of the course:

- To Understand the concept of Complex Numbers, Complex Function & Analytic Function.
- To Develop the skills of calculation and construction of graphs of complex function.
- To acquire the Knowledge of Complex Analysis.
- To Apply the knowledge of Complex Analysis for any real-time problem.

Unit	Sub Unit	Content	Credit									
1		Revision: The extended complex plane and its spherical representation, analytic functions, bilinear transformations, their properties and classifications, Branches of many valued functions with special reference to $\arg z$, $\log z$ and z^n , elementary Riemann surfaces, definition and properties of conformal mapping.	1									
2		Singularities, zeros of analytic functions, poles, residues, Residue Theorem, residue at poles, evaluations of improper integrals.	1									
3		Schwartz lemma, meromorphic functions, argument principle, Rouché's theorem, Open Mapping Theorem, Inverse function theorem. Cauchy–Goursat theorem, Morera's theorem, Cauchy's inequality, entire functions, Liouville's theorem, identity theorem, fundamental theorem of algebra, maximum modulus theorem and minimum modulus theorem. Contour Integration.	1									
4		Practical: Based on (1) Testing Various Properties of Complex Number, Modulus, Argument and Complex Conjugate, logarithmic, Conformal mapping. (2) Classify the various types of singularities by definition as well as using expansion of series. (3) Testing Analyticity of Complex function & Verifying the Theorems on analytic function. (4) Explain various theorems on complex integration & Rouché's theorem, Open Mapping Theorem Inverse function theorem. (5) Examples on Contour integration.	1									
Assessment & Evaluation	Credit	Internal	External	Total O/o 70								
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Sem. End Exam			70
	3	1	5		5	5	15	30	70	30	100	

REFERENCE BOOKS:

- Complex Analysis by L. V. Ahlfors, International Student Edition, Mc Gra w–Hill Book Company, 1979
- Complex Analysis by Karunakaran, Second Edition, Narosa Publishing House, 2006.
- A First Course in Complex Analysis with Applications by Dennis G. Zill and Patrick D. Shanahan, Second Edition, Jones & Bartlett Student Edition, 2010.
- Complex Analysis by S. Lang, Addison-Wesley, 1977.
- Foundations of Complex Analysis by S. Ponnusamy, Narosa Publishing House, 1977.
- Fundamentals of Complex Analysis with Applications to Engineering and Science by E. B. Saff and A. D. Snider, Third Edition, Pearson Education.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-I</p> <p style="text-align: center;">PaperNo:2110404</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Mathematics Credit: 4</p> <p>: Title of the paper:</p> <p>Advance Linear Algebra</p>
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Objective of the course:

1. To Understand important concepts of vector spaces and concept of Diagonalization, Canonical Forms & Quadratic Form.
2. To Develop the skills of Calculation & obtaining various Canonical Forms, Quadratic Form
3. To acquire Knowledge of Linear Algebra.
4. To Apply the knowledge of Linear Algebra for any real-time problem.

Unit	Sub Unit	Content	Credit
1		Revision: Vector spaces-subspaces, bases and dimensions. Matrix Theory - Rank & Inverse of a Matrix. Basic Concepts-Eigen Value & Eigen Vector of a Square Matrix, Characteristic equation of square matrix, Cayley-Hamilton Theorem, Relation between matrix and Eigen Values.	1
2		Canonical Forms of a Matrix: Basic Concepts- Minimum Polynomial of a Matrix, Block Matrix & Properties. Nilpotent Canonical Form (NCF), Jordan Canonical Form (JCF) & Rational Canonical Form (RCF) of a Matrix. Bilinear Form, Quadratic Form and its Properties. Conic Section - Reduction of conic equation into standard forms.	1
3		Linear transformations: Matrix associated with a Linear Map, Linear Map associated with a Matrix. Linear operations in μ, m, n , Only introduction of $L(U, V)$ and Isomorphism between $L(U, V)$ and μ, m, n , Dimension Theorems for μ, m, n and $L(U, V)$. Rank – Nullity of Matrices and verification of the Rank-Nullity Theorem for Matrices.	1
4		Practical based on:(1)Testing the properties of vector space and subspace.(2)Testing the given vectors for L.C/Span/Basis for different vector space.(3)Testing Various Properties of Similar Matrices, Diagonalizable Matrix, and Minimum Polynomial of a Matrix, Bilinear Form, Quadratic Form, NCF, and JCF & RCF.(4)Verifying the Theorems on Diagonalizable Matrix, Conic Section, NCF, and JCF & RCF.(5)Finding AM & GM of a square Matrix, LU-Factorization, QR- Factorization, Bilinear Form, Quadratic Form.(6)Construct Various Conic equation and find their standard forms.(7)Application of Diagonalizable Matrix- Power of a Matrix.(8)Construct the Bilinear Form & Quadratic Form and determine their nature.(9)Testing the properties of LT.(10)Finding basis for kernel and range of LT.(11) Construct the geometry of different linear operators.(12)Verification of Rank-Nullity (or Dimension) Theorem, Cauchy-Schwarz Inequality and Triangle inequality.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theor	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed.

Semester-I

Paper No:2110404

Compulsory

Subject: Mathematics

Credit: 4

: Title of the paper:

Advance Linear Algebra

REFERENCE BOOKS:

1. **Linear Algebra Theory and Applications** – Ward Cheney, David Kincaid. Jones and Bartlett India Pvt. Ltd. Complex Analysis by Karunakaran, Second Edition, Narosa Publishing House, 2006.
2. **Introduction to Linear Algebra** – Serge Lang. Springer (India).
3. **Matrix and Linear Algebra** – K. B. Dutta, Prentice Hall. Foundations of Complex Analysis by S. Ponnusamy, Narosa Publishing House, 1977.
4. **A Textbook of Matrices** – Shanti Narayan, P K Mittal, S. Chand Group Notes on Complex Function Theory by D. Sarasan, Hindustan Book Agency, 1994.
5. **Introduction to Linear Algebra** – V. Krishnamurthy, Affiliated East-west Press Pvt Ltd. L. V Ahlfors, Complex Analysis, 3rd edition, McGraw Hill, International Editions, New York-1966
6. **Elementary Linear Algebra Applications Version**- Chris Rorres & Howard Anton, Wiley India Pvt Ltd (2011)
7. **Linear Algebra and Its Applications**- Gilbert Strang, Nelson Engineering
8. Lenneth Hoffman, Ray Kunze, Linear Algebra, 2nd edition Prentice Hall of India New Delhi (1971)
9. P B Bhattacharya, Phani Bhusan Bhattacharya, S K Jain, S R Nagpaul, first course in Steven Roman, Advanced linear algebra, New Age International Ltd Publishers, New Delhi (2008)
10. Steven Roman, Advanced linear algebra, 3rd edition, Springer (2008)
11. Linear Algebra Problem Book - P. R. Halmos.
12. Linear Algebra with Applications - Jeanne, L. Agnew & Robert C. Knapp Brooks / Col publishing Co, California.



Indian Institute of Teacher Education, Gujarat.

M.Sc,M.Ed. Semester-I Paper No:2110504 Compulsory	Subject: Mathematics Credit: 4 : Title of the paper: Advance Latex Programming
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Objective of the course:

1. To Understand the concept of LaTeX Programming.
2. To Develop the skills of obtaining various output through LaTeX.
3. To acquire Knowledge of LaTeX Programming.
4. To Apply the knowledge of LaTeX for any type setting problem.

Unit	Sub Unit	Content	Credit									
1		Introduction to LATEX - LATEX – what it is? Typical LATEX Input File, Characters and Control Sequences, Required Components of a LaTeX Document, Typing LaTeX Commands. Basic elements of a LATEX - Font-size and other required formatting commands, Margins, line-spacing, Sections, sub-sections, paragraphs, and new-lines, Italics, bold-face, underlining, and centering, Examples of mathematical expressions, Lists, Tabbing.	1									
2		Text Formatting -Centering Text, Special Headers, Extended Quotation, Bulleted Lists, Numbered Lists, Filling a Line, Bibliographies, Line Breaks, Bibliography and Compound Expressions. Text and Formulas, Functions -sums, Integrals, and Limits, Roots, Text in Math Displays, Operators, Relations, Negated Symbols.	1									
3		Tables, Matrix, boxes, Slides, Graphics & Functions-The Slide Class, How to Use the Slides Class, the picture Environment, Basic Commands, Line Segments, Arrows, Circles.	1									
4		Practical Based on: The following programs are to be practiced: 1. Producing Simple Documents using LATEX 2. Producing Mathematical Formulae using LATEX. 3. Constructing various graphics using LATEX 4. Constructing various mathematical functions. 5. Finding errors in program syntax. 6. Presentation using beamer: Research papers, Book/Technical Report writing using LATEX.	1									
Assessment & Evaluation	Credit		Total O/o 70									
	Internal						External					
	Theory	Practical		Assignment	Project	Seminar	Test	Total	Sem. End Exam			
	0	4	5	5	5	15	30	Theory	Practical	Total	70	70

REFERENCE BOOKS:

- LaTeX: A Document Preparation System (2nd Edition) Leslie Lamport.
- A Guide to LATEX: Document Preparation for Beginners and Advanced Users (3rd Edition) Helmut Kopka, Patrick W. Daly.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc,M.Ed.</p> <p style="text-align: center;">Semester-I</p> <p style="text-align: center;">Paper No:2110604</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Mathematics Credit: 2</p> <p style="text-align: center;">: Title of the paper: Foundation course in Mathematical sciences-1</p>
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Objective of the course:

1. To understand the fundamentals of mathematical research.
2. To develop skill of reasoning.
3. To acquire the knowledge of mathematical methods.
4. To apply the knowledge of mathematics in real-time problems.

Unit	Sub Unit	Content	Credit									
1		Mathematics in various region: Babylonian Mathematics, Greek Mathematics, Egyptian Mathematics, Indian Mathematics, Islamic Mathematics, Medieval European Mathematics, Chinese Mathematics. Mathematics through ages: Mathematics during scientific revolution (17 th & 18 th Centuries), Modern mathematics age (19 th century to 21 st century).	1									
2		Development of Mathematical branches: history of algebra, history of calculus, history of geometry, history of combinatorics, history of number theory, history of statistics, history of trigonometry. Notable Mathematician and their contribution : Chinese mathematicians, Greek mathematicians, Hungarian mathematicians, Italian mathematicians, Indian mathematicians, Jewish mathematicians ,Russian mathematicians.	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		2	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- 1 A history of Mathematics, V J Katz Person
- 2 Development of Mathematics, E T Bell, Dover Publication.
- 3 A history of Mathematics, C B Boyer, 2nd edition, John Wiley Pub.
- 4 E T Bell, A man of Mathematics
- 5 History of Mathematics, Howard



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center; margin: 0;">M.A.,M.Ed.</p> <p style="text-align: center; margin: 0;">Semester-II</p> <p style="text-align: center; margin: 0;">Paper No: 1210300</p> <p style="text-align: center; margin: 0;">Compulsory</p>	<p style="text-align: center;">Subject: Education</p>	<p>Credit: 4</p>
<p>: Title of the paper:</p> <p>Psychological Foundation of Education– 1</p>		

Objective of the course:

- To enable the students to understand concept and process of educational psychology as an applied science.
- To acquaint the learner with the process of development and assessment.
- To enable the learner to understand implications of psychological theories of learning.
- To make the students understand the concept of learning acceleration, learning curve and plateaus of learning curve and their educational implications.
- To enable the students to understand theories of motivation and their educational implications.
- To make the students to understand the concept of information processing.
- To make the students to apply knowledge of psychology in their personal & cognitive development.

Unit	Sub Unit	Content	Credit
1	Educational psychology & cognitive Development		1
	1.1	Educational Psychology: <ul style="list-style-type: none"> • Definition of Psychology • Concept, Nature and scope of Educational Psychology • Psychology of Instruction: Meaning and its Nature 	
	1.2	Growth and Development <ul style="list-style-type: none"> • Definition, Meaning & Characteristics of Growth & Development • Principles of Development • Factors Influencing Development 	
	1.3	Stages of Development <ul style="list-style-type: none"> • Characteristics of each stage • Problems of Adolescence Period 	
2	1.4	Piaget's Theory of Cognitive Development <ul style="list-style-type: none"> • Terminologies: Schema, Cognitive Structure, Reflexes, Organization, Assimilation, Accommodation • Stages of Cognitive Development • Educational Implications of Cognitive Development 	
	2.1	Learning and Motivation <ul style="list-style-type: none"> • Definition and Characteristics of Learning • Gagne's Hierarchy of Learning: Types and Conditions 	1
	2.2	Learning Curve <ul style="list-style-type: none"> • Meaning, Types, Characteristics & Educational Implications of Learning Curve • Plateaus in Learning Curve; Causes of Plateaus in Learning Curve; Suggestions to Remove Plateaus of Learning Curve 	
	2.3	Motivation <ul style="list-style-type: none"> • Meaning and factors affecting motivation • Role of motivation in learning • Maslow's self-actualization theory 	
2.4	Transfer of Learning <ul style="list-style-type: none"> • Theories of transfer of learning • Educational implication 		
3	3.1	Learning Theory of Thorndike (Trial & Error) <ul style="list-style-type: none"> • Puzzle Box Experiment • Laws of Learning and its educational implications 	1
	3.2	Pavlov's Classical Conditioning Theory of Learning: <ul style="list-style-type: none"> • Experiment, • Process • Findings and Educational Implications 	
	3.3	Bandura's Theory of Social Learning <ul style="list-style-type: none"> • Meaning and Essentials of Social Learning • Bobo Doll Experiment • Social Learning Process • Educational Implications 	

4	3.4	Bruner's Theory of Discovery Learning <ul style="list-style-type: none"> • Meaning and types of Concept • Meaning of Discovery Learning • Steps and educational implication 	1
	4.1	Hull's Drive Reduction Theory of learning <ul style="list-style-type: none"> • Four Level Learning Theory • Postulates for Learning • Educational Implications 	
	4.2	Tolman's Sign Gestalt Theory of learning <ul style="list-style-type: none"> • Meaning of Sign – Gestalt Theory • Types of learning • Laws of Learning • Educational Implications 	
	4.3	Information Processing <ul style="list-style-type: none"> • Levels of information • Model of Information processing • Educational Implications 	
	4.4	Constructivism <ul style="list-style-type: none"> • Concept & Characteristics • Role of teacher in constructivist learning • Educational Implications 	

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

English

- 1 Agrawal, J. C. (1994). **Essentials of Educational Psychology**. New Delhi :Vikas Publishing House Pvt. Ltd.
- 2 Anderson, J. (1990) **Cognitive Psychology and its Implications (3rd ed.)**. New York : Freeman.
- 3 Asthana, Bipin. (2009) **Measurement and Evaluation in Psychology & Education**. Agara : Agrawal Publications.
- 4 Bandura, A. (1977) **Social Learning Theory : Upper Saddle River**. New Jersey : Prentice Hall.
- 5 Bruner, J. (1966) **Toward a Theory of Instruction**. New York : Norton.
- 6 Bruner, J. (1977) **Relevance of Education**. New York : Norton.
- 7 Chauhan, S. S. (1978) **Advanced Educational Psychology**. New Delhi : Vikas Publishing House Pvt. Ltd.
- 8 Dandpani, S. (2007) **A Textbook of Educational Psychology**. New Delhi : Anmol Publications Pvt. Ltd.
- 9 Gagne, R. M. (1985) **The Conditions of Learning and a Theory of Instruction (4th ed.)**. New York : Holt, Rinehart and Winston.
- 10 Kohlberg, L. (1981) **Philosophy of Moral Development**. New York : Harper and Row.
- 11 Mangal, S. K. (1987) **Educational Psychology**. New York : John Wiley and Sons.
- 12 Maslow, A. (1970) **Motivation and Personality, (2nd ed.)**. New York : Freeman.
- 13 Mayer, R. (1987) **Educational Psychology, A Cognitive Approach**. Boston : Little, Brown.
- 14 Mathur, S. S. (2009) **Educational Psychology**. Agara : Agrawal Publications.
- 15 Piaget, J. (1965) **The Moral Judgement of the Child**. New York : Free Press.
- 16 Piaget, J. (1952) **Origins of Intelligence in Children**. New York : International Universities Press.
- 17 Thakur, A. S. & Sandip, Berwal (2013) **Development of Learner and Teaching – Learning Process**. Agara : Agrawal Publications.
- 18 Tolman, E. C. and Honzik, C. H. (1930) **Maze Learning in Rats - Maze Performance in Rats**. California : University Publications.
- 19 Tolman, E. C. (1932) **Purposive Behaviour in Animals and Men**. New York : Century.

Gujarati

ભદ્ર કુસુમબેન કે.(૧૯૮૬)વ્યાક્રત્વના સિધાંતો-અમદાવાદ:યુનિવર્સિટી ગ્રંથ નિમોણ બોર્ડ
 દેસાઈ કે. જી., સી. ટી., ભોપતકાર અને જી. અચુ શાહ (૧૯૮૧) મનોવેજ્ઞાનક પારિભાષા અને
 વિભાવના-અમદાવાદ:યુનિવર્સિટી ગ્રંથ નિમોણ બોર્ડ
 દોગ્રા નનુભાઈ (૧૯૮૫)અધ્યાપન મનોવિજ્ઞાન-રાજકોટ: જીજીજી સાયકો સેન્ટર
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 દોગ્રા નનુભાઈ, (૨૦૦૭)અધ્યયનનું મનોવિજ્ઞાન-રાજકોટ: જીજીજી સાયકો સેન્ટર.
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Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-II</p> <p style="text-align: center;">Paper No: 1210400</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education Credit:2</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Communication and compository writing</p>
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Objective of the course:

- To gain insight and reflect on the concept and process of communication.
- To develop an insight for academic listening and note taking.
- To acquaint with academic communication and its importance.
- To develop skills of writing and identification of different styles.

Unit	Sub Unit	Content	Credit									
1		Communication Skills Meaning, concept and components of effective communication Strategies of effective communication Role and usage of ICT in effective communication Development of pre-academic skills (pre-reading, pre-writing and pre-presentation)	0.5									
2		Academic Listening and Note taking- Informational listening, Critical Listening and Therapeutic listening Meaning, concept and importance of Informational listening, Critical Listening and Therapeutic listening Academic Listening- Listening to Lectures, observing tone and taking notes. Skills for a good listener – Listening to educational film <ul style="list-style-type: none"> • Developing and Presenting the notes 	0.5									
3		Academic Communication- classroom communication, seminar and workshops Meaning, concept and importance Seminar – skills for presenting research paper and article Academic Workshops - Developing and Participating in workshop Communicating with publishers for publication of articles and research paper	0.5									
4		Types of Writing – Expository, Narrative, Descriptive, Argumentative Meaning and concept of Expository, Narrative, Descriptive, Argumentative writings Development or writing of Expository, Narrative, Descriptive, Argumentative paragraphs Identification of different type of writing from the given sample Writing of Expository, Narrative, Descriptive, Argumentative paragraphs	0.5									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		Theory	Practical				Total	Theory	Practical	Total		
		0	2	5	5	5	15	30	0	70	70	70

REFERENCE BOOKS:

Anderson, Kenneth and Joan Ma dean. Study Speaking. Cambridge University Press 2010

Taylor, Shirley. Communication for Business. Pearson. Delhi. 2005

Carter, Sam and Norman Whitby. Improve your IELTS readings skills. Macmilan, Delhi 2009

Foundation Course in English -2, FEG – 2 , Volume 1-4, IGNOU Study Material

<https://www.skillsyouneed.com/ips/listening-types.html>



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-II</p> <p style="text-align: center;">Paper No:2210704</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Mathematics Credit: 4</p> <p style="font-size: 1.2em;">: Title of the paper:</p> <p style="font-size: 1.2em;">Ordinary Differential Equation</p>
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Objective of the course:

- To Understand the concept of Ordinary Differential Equations.
- To Develop the skills of obtaining solutions of Various Ordinary Differential Equations.
- To acquire Knowledge of Various Ordinary Differential Equations.
- To Apply the knowledge of Various Ordinary Differential Equations for any real-time problem.

Unit	Sub Unit	Content	Credit									
1		Linear System of Differential Equations: The existence and uniqueness theorem, Linear Homogenous systems, Linear Non-Homogenous systems, Nonlinear system of first order equations.	1									
2		Linear System with constant coefficients: The exponential of matrix, Eigen values and eigen vectors of matrices, calculation of fundamental matrix, two dimensional linear systems, some population problems, an electric circuit.	1									
3		Series solutions of Linear Differential Equations: Review of properties of power series, second order linear equations with analytic coefficients, theorem on solutions in power series, singular points of linear differential equations, solutions about a regular singular point, exceptional cases, the Bessel equation and some properties of Bessel functions, singularities at infinity, irregular singular points with an introduction to asymptotic expansions.	1									
4		Practical Based on: <ol style="list-style-type: none"> 1. Application of First order ODE-Geometric Application, Orthogonal Trajectories, Laws of Growth and Decay. 2. Classify the various higher orders ODE and Application of Higher order ODE – RLC Circuit, Simple Pendulum. 3. Verify some properties of Bessel Functions. 4. Verify the Series Solution of Second order ODE. 	1									
Assessment & Evaluation		Credit	Internal			External			Total O/o 70			
		Theory	Practical	Assignment	Project	Seminar	Test	Total		Sem. End Exam		
		3	1	5	5	5	15	30	Theory 70	Practical 30	Total 70	70

REFERENCE BOOKS:

- (1) **Differential Equations**, E.Rukumangadachari, Pearson .
- (2) **“Ordinary Differential Equations”**, First course by R. Brauer and J. A. Nohel, Second edition, Benjamin Inc.
- (3) Ordinary Differential Equations by G. Birkoff and G. C. Rota, Second edition, Ginn and Co(1995)
- (4) Introduction to Ordinary Differential Equations by E. A. Coddington, Prentice Hall of India, 1996.
- (5) Elements of Ordinary Differential Equations by M Golom and M. E. Shinks, Second Edition, McGraw-Hill Books Co., 1965.
- (6) Theory and Problems of Differential Equations by F. Ayers, McGraw Hill, 1972.
- (7) Advanced Engineering Mathematics by E. Kreyzig, John Wiley and Sons, 2002.
- (8) **Differential Equations: Theory Technique and Practice** -George F. Simmons, Steven G. Grantz, Tata McGraw-Hill.



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-II</p> <p style="text-align: center;">Paper No:2210804</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Mathematics Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Combinatorics & Graph Theory</p>
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- Objective of the course:**
- To Understand the concept of Combinatorics and Graph Theory.
 - To Develop the skills of calculation, Construction & Identifying various graphs, digraphs & its operations.
 - To acquire the Knowledge of Combinatorics and Graph Theory.
 - To Apply the knowledge of Combinatorics and Graph Theory for any real-time problem.

Unit	Sub Unit	Content	Credit									
1		Revision: Permutations and Combinations, Basic Counting techniques, The pigeonhole principle, The Inclusion-Exclusion Principle and Applications. Mobius Inversion. Partially Ordered sets and their mobius functions.	1									
2		Generating Functions, Recurrence Relations, Binomial & Multinomial Coefficients, Polya's Theory of Counting. Gauss-Jacobi identity, Jacobi identity, Asymptotic Properties of P(n).	1									
3		Graphs : Definitions and examples, Subgraphs, walks, paths and cycles, Connectedness, Matrix representation of graphs, Operations on graphs, connectedness algorithm. Trees and connectivity : Definition and simple properties, Bridge, spanning trees, Caley's theorem. Graph Coloring- Chromatic Number, Four colour theorem. Various Graph Parameters.	1									
4		Practical : (1) Applications of Permutations, combinations & pigeonhole principle. (2) Applications of polya's theory, Gauss-Jacobi identity & Asymptotic properties of p(n). (3) Explain various graph parameters and graph operations & construct graphs for various algorithms. (3) Finding Eulerian graph, Hamiltonian graph cut sets, Dominating set, vertex cover, edge cover, matching set, independent set, Distance, diameter, different types of sub graphs. (4) Application of Eulerian graph & verify different graphs for it. (5) Various Applications for Matching & Hungarian Algorithm.	1									
		Credit	Internal	External								
Assessment & Evaluation		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Total O/o 70
		3	1	5	5	5	15	30	70	30	100	

REFERENCE BOOKS:

- "Combinatorics and Graph theory" – by Harris John, Hirst Jeffry L, Mossinghoff, Michael, 2nd ed., (2008) Springer.
- "Graph Theory"- by Bondy J A, Murthy U.S., (2008) Springer
- "Discrete Mathematics & its Applications" – by Rosen K.H. 6th ed, Tata McGraw Hill
- "Combinatorics – Topics, Techniques & Algorithms" – by Peter J. Cameron – Cambridge University Press, 1994.
- "Introductory Combinatorics (4th Edition)" – by Richard A. Brualdi, Pearson Education
- "Introduction to graph theory" – by D B West, Prentice Hall
- John Clerk and Derek Allan Holton : A first look at Graph Theory (Allied Publishers Ltd./World Scientific).
- F. Haray : Graph Theory.



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M.Sc.,M.Ed. Semester-II Paper No:2210904 Compulsory	Subject: Mathematics	Credit: 4
: Title of the paper: Topology		

Objective of the course:

- To Understand the theory of metric spaces and topological spaces.
- To Develop the skills of finding open sets, closed sets, limit points, etc.
- To acquire Knowledge of metric spaces and topological spaces.
- To Apply the knowledge of Topology for any problem.

Unit	Sub Unit	Content	Credit
1		Metric spaces: Open sets, closed sets, convergence, completeness, Relations, Well ordered set, Topological spaces Basis for a Topology.	1
2		Topological spaces, neighbourhoods, base, subbase, The Subspace Topology, Order Topology, Product Topology, Closed sets and limit points.	1
3		Compactness, Tychonoff theorem, T1-spaces and Hausdorff spaces. Completely regular spaces, normal spaces, Urysohn's Lemma, one point compactification and Tietze extension theorem.	1
4		Practical Based on: <ol style="list-style-type: none"> 1. Creating the examples for given condition. 2. Testing the properties of metric space, Various topological spaces, Compact Space & Connected space. 3. Verifying the various theorems on metric space, Various topological spaces, Compact Space & Connected space. 	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

- Munkres J., Topology : A first course, Prentice-Hall of India Pvt Ltd, New Delhi.
- Simmons G. F., Introduction to Topology and Modern Analysis, McGraw Hill Company, Tokyo.
- Willards S., General Topology, Addition-Wesley, Reading, 1970.
- K.D.Joshi, General Topology, Wiley Eastern
- J.L.Kelley, General Topology, Van Nostrand
- Topology- J. Dugundji, Prentice- Hall of India, 1975.



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-II</p> <p>Paper No:2211004</p> <p>Compulsory</p>	<p>Subject: Mathematics Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Introduction to Scilab</p>
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Objective of the course:

- To Understand the concept of SciLab Language.
- To Develop the skills of obtaining various output through Programming in SciLab.
- To acquire Knowledge of SciLab.
- To Apply the knowledge of SciLab for any type setting problem.

Unit	Sub Unit	Content	Credit
1		Basic syntax, Mathematical Operators, Predefined constants, Built in functions.	1
2		Complex numbers, Polynomials, Vectors, Matrix. Handling these data structures using built in functions.	1
3		Programming - Functions - Loops - Conditional statements - Handling .sci files	1
4		Graphics handling - 2D, 3D - Generating .jpg files	1

Assessment & Evaluation	Credit		Internal					External			Total O/o
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	4	5	5	5	15	30	0	70	70	70

REFERENCE BOOKS:

- Programming in Scilab 4.1 by Vinu V. Das
- Introduction to Scilab For Scientists and Engineers by John Maclane
- Introduction to Scilab: For Scientists and Engineers: Sandeep Nagar



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-II</p> <p style="text-align: center;">Paper No:2211104</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Mathematics Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Number Theory</p>
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Objective of the course:

- To Understand the concept of Divisibility, Congruence & Arithmetic functions.
- To Develop the skills of calculation of Divisibility & Congruences and the skills of Identifying the role of Arithmetic functions.
- To acquire the Knowledge of Number Theory.
- To Apply the knowledge of Number Theory for any real -time problem.

Unit	Sub Unit	Content	Credit									
1		Revision: Divisibility, Prime Numbers. Divisibility in integers, Division algorithm, G.C.D., L.C.M. Fundamental theorem of arithmetic. The number of primes. Mersene numbers and Fermat's numbers.	1									
2		Congruences, Linear Congruences and their solutions, Chinese Remainder Theorem, Degree of a Congruence relation and related theorems. Fermat's and Euler's theorems. Wilson's Theorem.	1									
3		Quadratic Reciprocity: - Quadratic residue, Legendre's symbol, Its properties, Quadratic reciprocity law, Jacobi symbol, Its properties. Sums of Two Squares. Arithmetic Functions: Euler function, Greatest integer function, Divisor function, Mobius function $\mu(n)$. Properties and their inter relation.	1									
4		Practical: (1) Testing the properties of divisibility, congruence and various arithmetic functions. (2) Verify the theorems on divisibility, congruence and various arithmetic functions. (3) Creating the examples for given condition. (4) Application- Diophantine equations.	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
								Sem. End Exam				
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	
		3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

- THE THEORY OF NUMBERS (Authors: Ivan Niven Herbert S. Zuckerman, Hugh L. Montgomery)
- NUMBER THEORY (Authors: Z. I. Borevich and I. R. Shafarevich)
- AN INTRODUCTION TO THE GEOMETRY OF NUMBERS (Authors: J. W. S. Cassels)
- HISTORY OF THE THEORY OF NUMBERS (Authors: L. E. Dickson)
- T.M. Apostol, An Introduction to Analytical Number Theory (Springer International Student's Edition)
- David M Burton, Elementary Number Theory (Universal Book Stall, New Delhi)
- S. G. Telang, Number Theory (Tata Macgrow Hill)
- G. H. Hardy and E. M. Wright, Introduction to Number Theory (The English language book society and oxford university press)



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-II</p> <p>Paper No:2211204</p> <p>Compulsory</p>	<p>Subject: Mathematics Credit: 2</p> <p>: Title of the paper:</p> <p>Foundation course in Mathematical sciences-2</p>
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Objective of the course:

- To understand the fundamentals of mathematical research.
- To develop skill of reasoning.
- To acquire the knowledge of mathematical methods.
- To apply the knowledge of mathematics in real-time problems.

Unit	Sub Unit	Content	Credit
1		Vedic Mathematics- Introduction, Historical background. Sixteen Vedic sutras & its thirteen sub sutras – interpretation & its uses.	1
2		Utility of Vedic Mathematics’ techniques: Simplify Arithmetic computation – addition,multiplication,division, percentage, HCF. Simplify Algebraic techniques , – factorization , roots of simple equations.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	2	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- Vedic Mathematics, V S Agrawala & Bharti Kisna Tirthji , Motilal Press, New Delhi.



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-III</p> <p style="text-align: center;">Paper No: 1310500</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">ICT in Education</p>
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Objective of the course:

- Understand what information and communication technology is
- Communicate effectively
- Understand various forms of multimedia
- Software analyze data utilizing statistical packages
- Create TLM utilizing computer technology

Unit	Sub Unit	Content	Credit									
1		Introduction to Information Technology 1.1 Definition, Scope, Levels and Types of Information 1.2 Properties and need of information 1.3 Value of information, Resistance to information flow, Caution against over usage of information technology 1.4 Concept of information and communication technology	1									
2		Understanding of communication process 2.1 Concept of communication, needs of communication, communication process : Shannon model 2.2 Types of communication: Target related, Process related, message related, Direction related 2.3 Barriers to communication Factors affecting communication 2.4 Effective classroom communication	1									
3		Communication Medias and Network Technology 3.1 Meaning, Characteristics and psychological basis for classification of media 3.2 Concept, Importance and creation of: Educational animation, Multimedia, Talking book, e-book, CAI, CAL etc. 3.3 Internet: Meaning, Working method, usefulness available services. Educational use of email, video, audio conferencing, chat, Face book, tweeter 3.4 Concept and usefulness of institutional website online-offline learning	1									
4		Use of Computer in Research and Education 4.1 Search engine: Searching and location gaps and related literature 4.2 Coding, Classification and analysis of data through SPSS, Excel 4.3 Report writing through word processor 4.4 Creating, Teaching Learning Material - Power Point presentation - Computer Assisted Learning - Program Learning Material - Animation : Flash	1									
		Credit	Internal		External							
Assessment & Evaluation		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Total O/o 70
		Theory	Practical	Total	Theory	Practical	Total					
		2	2	5	5	5	15	30	35	35	70	70

REFERENCE BOOKS:

- Microsoft Outlook 2016 Step by Step 1 Feb 2016 by Joan Lambert, Steve Lambert
- Microsoft Word 2016 Step by Step, authered by Joan Lambert, Pearson Education, 2015
- Microsoft Excel 2016 Step by Step, authered by Curtis Frye, Pearson Education, 2015
- Microsoft PowerPoint 2016 Step by Step, authered by Kevin Wilson, Pearson Education, 2015



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-III</p> <p style="text-align: center;">Paper No: 1310600</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 4</p> <p>: Title of the paper:</p> <p>Methods of Research in Education -2</p>
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Objective of the course:

- Explain various types of research methods
- Discriminate qualitative and quantitative researches
- Differentiate levels of measurement of data
- Selects appropriate statistical technique for analysis of data
- Describe how to prepare research report
- Enlist the criteria for evaluating research report

Unit	Sub Unit	Content	Credit								
1	1.0	METHODS OF RESEARCH	1								
	1.1	Historical method: Meaning, Purposes, Primary and Secondary sources External and Internal criticism of sources, Steps in conducting historical studies.									
	1.2	Survey Method : Meaning and types of survey, Steps of conducting survey									
	1.3	Inter relationship studies: case study, causal comparative study correlation study									
2	1.4	Developmental studies: longitudinal and cross sectional studies.	1								
	2.0	METHODS OF RESEARCH-2									
	2.1	Experimental research method: Meaning and characteristics, Method of acquiring control, Internal and external validity, Various types of experimental designs.									
	2.2	Concept and characteristics of qualitative research, comparison with quantitative research.									
3	2.3	Ethnographic studies	1								
	2.4	Content analysis method									
	3.0	TREATMENT OF DATA									
	3.1	Levels of measurement data									
4	3.2	Meaning of treatment of data, editing coding classification tabulation	1								
	3.3	Selection of Technique for analysis of data descriptive and inferential statistics									
	3.4	Conclusions generalization and implications									
	4.0	WRITING RESEARCH REPORT									
	4.1	Divisions of research report: (a) Preliminary part (b) content part (chapterization): introduction of research problem, review of related literature methodology, analysis and interpretation of data, result section, (c) supplementary part: appendices, bibliography, glossary of terms, abstract.	1								
	4.2	Format, style, typing, quotations, footnotes, bibliography, pagination, tables, figures, graphs									
	4.3	Criteria for evaluating research report									
	4.4	Avoiding plagiarism									
Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Sem. End Exam										
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	

Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed.

Semester-III

Paper No: 1310600

Compulsory

Subject: Education

Credit: 4

: Title of the paper:

Methods of Research in Education -2

REFERENCE BOOKS:

English

- 1 Agrawal Y.P. (1988) Better Sampling: Concepts, Techniques and Evaluation. New Delhi: Sterling Publishers Private Ltd.
- 2 Anastasi, A. (1988) Psychological Testing New York: the Macmillan company
- 3 Backstrom, C.H. & Gerald, Hursh-cesar. (1981) Survey Research New York, John Wiley & Sons
- 4 Best j.w. (1993) research in education, New Delhi: Prentice-Hall of India Pvt. Ltd.
- 5 Bogdan, R and Taylor, S.J. (1975) Introduction to Qualitative Research Methods. New York, John Wiley & Sons
- 6 Bogdan R.C. & Biklen, S.K. (1998) Introduction to Qualitative Research of Education: An Introduction to Theory and Methods Boston: Allyn and Bacon
- 7 BUCH, M.B., (Ed) (1974) A survey of research in, education, MSU, Baroda, CASE
- 8 BUCH, M. B., (Ed) (1979) Second survey of research in education, Baroda, SERD,
- 9 BUCH, M.B. (Ed) (1986) Third survey of research in education, New Delhi, NCERT,
- 10 Buch, M.B. (Ed). (1991). Fourth survey of research in education, New Delhi, NCERT
- 11 Campbell W.G. (1969) Form and Style in Thesis Writing. Boston: Houghton Mifflin Company
- 12 Champion, C.M. (1981) The Design of Educational Experiments. New York: McMillan Publishing Co. Inc.
- 13 Champion, D.J. (1981) Basic Statistics for Social Research, New York: McMillan Publishing Co. Inc.
- 14 Cohen, L. & Manion Lawrence (1994) research Methods in Education London Routledge
- 15 Cronback, L.J. (1970) Essentials of Psychological Testing New York: Harper & Row Publishers
- 16 Dayton, C.M. (1974) The Design of Educational Experiments. New York: McGraw Hill Book. Co.
- 17 Denzin, N. K. and Lincoln, Y.s. (Eds) (2000) Handbook of Qualitative Research, London : Sage
- 18 Desai, H.G. (1979) Style Manual for dissertations/Theses Rajkot : Saurashtra University
- 19 Edwards, A.L. (1957) Techniques of Attitude Scale Construction New York: Appleton Century Crofts . Inc
- 20 Gall, M.D., Gall, J.P. and Borg, W.R. (2007) Educational Research: An Introduction, Boston: Allyn and Bacon

Gujarati

- 1 ઉચાટ, ડી.એ. અને અન્યો (સં) (૨૦૦૬) શૈક્ષણિક સંશોધનનો સારાંશ (૧૯૭૮-૨૦૦૬) રાજકોટ: શિક્ષણશાસ્ત્ર ભવન, સૌરાષ્ટ્ર યુનિવર્સિટી
- 2 ત્રિવેદી, એમ.ડી. અને પારેખ, બી.યુ. (૧૯૮૯) શિક્ષણમાં આંકડાશાસ્ત્ર, અમદાવાદ: યુનિવર્સિટી ગ્રંથાલેખકો બોર્ડ
- 3 દેસાઈ, એચ.જી. અને દેસાઈ, કે. જી. (૧૯૯૭) સંશોધન પદ્ધતિઓ અને પ્રાવેધિઓ, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- 4 દેસાઈ, એચ.જી. અને દેસાઈ, કે. જી. (૧૯૯૪) મનોવેજ્ઞાનેક માપન, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- 5 પટેલ આર. એસ. (સં) (૨૦૦૮) એમ.એડ. લઘુશોધ નિબંધના સારાંશ: અમદાવાદ, જયપબ્લીકેશન.
- 6 મોદી, ડી.જી. અને અન્યો (૧૯૯૧) સંશોધનની માધુકરી, ભાવનગર શિક્ષણશાસ્ત્ર ભવન, ભાવનગર યુનિવર્સિટી
- 7 શાહ, દિપીકા બી. (૨૦૦૪) શૈક્ષણિક સંશોધન, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed. Semester-III Paper No: 1310700 Compulsory	Subject: Education Credit: 4 : Title of the paper: PRINCIPLES AND TECHNIQUES OF LEARNING
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Objective of the course:

- To enable the students to understand process of learning and its various components.
- To enable the students acquire knowledge about approach, Methods and techniques to learning.
- To acquaint the students about planning of instruction for learning.
- To enable the students to understand various methods, media and use of technology to strengthen the process of learning
- To enable the students to understand the evolution and feedback for the process of learning.

Unit	Sub Unit	Content	Credit																																															
1		Learning: Meaning and concept Meaning of learning Learning: a complex, a automated and continuous process Prerequisites for learning <ul style="list-style-type: none"> ▪ Pre-learnt behaviors (experiences) ▪ Process of acquisition ▪ Learning languages (Primary and secondary) 	1																																															
2		Effective learning Approaches, Methods and Techniques Learning: A process <ul style="list-style-type: none"> ▪ Learning through association ▪ Acquisition ▪ Process of socialization ▪ Activity based learning Instructor lead learning Self-learning Techniques Learning by doing	1																																															
3		Make learning effective through Programmed Learning Workshop/symposia Role-play/Drama Models of teaching	1																																															
4		eLearning Meaning, Logic and importance Use of computer aided package of learning Technology mediated learning Techniques of enhancing learning through technology.	1																																															
Assessment & Evaluation		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Credit</th> <th colspan="7" style="width: 40%;">Internal</th> <th colspan="3" style="width: 30%;">External</th> <th rowspan="2" style="width: 10%;">Total O/o</th> </tr> <tr> <td></td> <td style="width: 5%;">Theory</td> <td style="width: 5%;">Practical</td> <td style="width: 5%;">Assignment</td> <td style="width: 5%;">Project</td> <td style="width: 5%;">Seminar</td> <td style="width: 5%;">Test</td> <td style="width: 5%;">Total</td> <th colspan="3" style="text-align: center;">Sem. End Exam</th> </tr> <tr> <td></td> <td style="width: 5%;">Theory</td> <td style="width: 5%;">Practical</td> <td style="width: 5%;">Assignment</td> <td style="width: 5%;">Project</td> <td style="width: 5%;">Seminar</td> <td style="width: 5%;">Test</td> <td style="width: 5%;">Total</td> <td style="width: 5%;">Theory</td> <td style="width: 5%;">Practical</td> <td style="width: 5%;">Total</td> <td style="width: 10%;">70</td> </tr> <tr> <td></td> <td>4</td> <td>0</td> <td>5</td> <td>5</td> <td>5</td> <td>15</td> <td>30</td> <td>70</td> <td>0</td> <td>70</td> <td>70</td> </tr> </table>	Credit	Internal							External			Total O/o		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam				Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	70		4	0	5	5	5	15	30	70	0	70	70	
		Credit	Internal							External			Total O/o																																					
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam																																										
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	70																																							
	4	0	5	5	5	15	30	70	0	70	70																																							

REFERENCE BOOKS:

- Arends, R. I. (1994). Learning to teach, Mc Graw-Hill, Inc. New York.
- Aggarwal, J.C. (1985). Theory and Principles of Education, Philosophical bases of education. Vikas Publisher
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- C.E.R.I., (1971). Educational Technology: The design & implementation of learning systems, OECD Publications.
- Jacobson, D.; Eggen, P. & Kanchak, D. (1989). Methods for teaching columbia, Merrill Publishing company.
- Dave Jayendra et.al. : Adhyayan Adhyapan Pravrti Ane Shikshan.
- Joseph, K.S. (2003). Learning to Educate, Vadodara, Gold Rock Publications,
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Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-III</p> <p style="text-align: center;">Paper No:2311304</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Mathematics Credit:4</p> <p>: Title of the paper:</p> <p>Mathematical Modelling</p>
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Objective of the course:

- To Understand the basics of mathematical modelling.
- To Develop the skills of formulation and analysis of various models.
- To acquire Knowledge Mathematical Modelling.
- To Apply the knowledge of Mathematical Modelling to any real-time problem.

Unit	Sub Unit	Content	Credit										
1		Introduction to the subject, its scope and limitation, classification of models. Dimensional Homogeneity, Technique of dimensional analysis, an arithmetic model of Gravity, Simple population growth model, Logistic population growth model, Geometric interpretation of logistic growth function.	1										
2		Two Species Population Models: Prey Predator modes for population dynamics, Geometric interpretation and stability of Prey Predator model, competition model, Epidemic Models, Simple deterministic model, SIS Model, Epidemic Models with constant number of carriers, Epidemic model with removal.	1										
3		Traffic Models: Macroscopic Highway traffic model, continue hypotheses and the fundamental diagram, linear car following models.	1										
4		<p style="text-align: center;">Practical</p> <p>(1) Geometrical Interpretation of logistic population growth model & simple population growth model.</p> <p>(2) Real life examples on simple population growth model & logistic growth model.</p> <p>(3) Geometric Interpretation of Prey predator model, competition model, Epidemic models, Simple deterministic model, SIS model.</p> <p>(4) Examples for above all models in practical 3.</p> <p>(5) Applications of Genetics models & diabetes Mellitus model.</p> <p>(6) Applications of Traffic models.</p>	1										
Assessment & Evaluation	Credit	Internal	External	Total O/o 70									
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Sem. End Exam				
	3	1	5		5	5	15	30	Theory	Practical	Total	70	30

REFERENCE BOOKS:

- Braum, Colemem & Drew, Differential Equation Models, Springer Verlag, 1983.
- Martin Braun, Differential Equation and their application, Springer Ver. 1977.
- Dym & Lvey, Principles of Mathematics Modeling, Academic Press-1980.
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- R. Millman and G. Parker : Elements of differential Geometry. (Englewood Cliffs, N.J., Prentice Hall, 1977).
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- J. N. Kapur, Mathematical Models in Biology and Medicine, East West press Pvt Ltd., 1992 .



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed. Semester-III Paper No:2311514 Elective	Subject: Mathematics	Credit: 4
: Title of the paper: Abstract Algebra -2		

Objective of the course:

1. To Understand basics of abstract algebra, including binary operations, groups, subgroups, etc.
2. To Develop the skills of solving problems about the size and composition of Groups.
3. To acquire Knowledge of fundamental theorems of Abstract Algebra.
4. To Apply the knowledge of the fundamental properties of abstract algebraic structures, their substructures, their quotient structure, and their mappings.

Unit	Sub Unit	Content	Credit
1		Irreducible Polynomials and Eisenstein Criterion, Adjunction of roots, Algebraic Extensions, Algebraically closed fields. Extensions of field, Finite, algebraic and simple field extensions, algebraic and transcendental numbers.	1
2		Splitting fields, Normal extensions, Multiple roots, Finite fields, Separable extensions.	1
3		Roots of unity and cyclotomic polynomials, cyclic extensions, Polynomials solvable by radicals, Symmetric functions, Ruler and compass constructions.	1
4		Automorphism groups and fixed fields, Fundamental theorem of Galois theory, Fundamental theorem of Algebra. The fundamental theorem of Galois theory, solvability by radicals, Galois group over the rationals, finite fields.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- 1) Algebra by M. Artin, Prentice-Hall of India Private Ltd., New Delhi, 1994.
- 2) Algebra Volume 1 by P.M. Cohn, John Wiley Pub., New York, 1974.
- 3) Contemporary Abstract Algebra by J. A. Gallian, Fourth Edition, Narosa Publishing House, New Delhi, 2000.



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-III</p> <p style="text-align: center;">Paper No:2311524</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Mathematics Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Functional Analysis</p>
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Objective of the course:

1. To Understand the concepts of Functional Analysis.
2. To Develop the skills to produce examples and counterexamples illustrating the mathematical concepts presented in the course.
3. To acquire Knowledge of Hilbert and Banach space theory.
4. To Apply the knowledge of Functional analysis for any real-time problem.

Unit	Sub Unit	Content	Credit									
1		Normed linear spaces, Banach spaces, Quotient space of a normed linear spaces and its completeness, bounded linear transformations, normed linear spaces of bounded linear transformations, dual spaces with examples.	1									
2		Weak convergence in normed linear spaces, equivalent norms, Riesz lemma, Basic properties of finite dimensional normed linear spaces and compactness, weak convergence in normed linear spaces, reflexive spaces.	1									
3		Inner product space, Hilbert space, orthonormal sets, Bessel's inequality, complete orthonormal sets, Parseval's identity, structure of Hilbert spaces, projection theorem, Riesz representation theorem for bounded linear functional on Hilbert spaces, reflexivity of Hilbert spaces	1									
4		Uniform Boundedness theorem and its consequences, open mapping theorem, closed graph theorem, Hahn-Banach theorem for normed linear spaces, compact operations, solvability of linear equations in Banach spaces, the closed range theorem.	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
		Theory	Practical						Sem. End Exam			
		4	0	Assignment	Project	Seminar	Test	Total	Theory	Practical		Total
		4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- 1) Bachman G. and Warici L, Functional Analysis, Academic Press, 1966.
- 2) Conway J. B., A Course in Functional Analysis, Springer-verlag, Newyork, 1990.
- 3) Krishnan V. K. , Text Book of Functional Analysis; A Problem oriented approach, Printice Hall of India, 2001 .
- 4) Limaye B. V., Functional Analysis, New Age International Pvt. Ltd., 2001.
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Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-III</p> <p>Paper No:2311604</p> <p>Compulsory</p>	<p>Subject: Mathematics Credit: 2</p> <p>: Title of the paper:</p> <p>Foundation course on research in Mathematical sciences-3</p>
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Objective of the course:

1. To understand the fundamentals of mathematical research.
2. To develop skill of reasoning.
3. To acquire the knowledge of mathematical methods.
4. To apply the knowledge of mathematics in real-time problems.

Unit	Sub Unit	Content	Credit
1		Mathematical Grammar & Vocabulary : Theorem, Corollary , lemma , Proposition , axioms ,postulates , hypothesis , conjecture , existence , uniqueness , boundedness , characteristic & property – meaning & differences. Algorithm – basic concepts, sorting & its Complexity.	1
2		Various Proof methods: Direct proof, indirect proof , contrapositive method , contradiction method, proofs by cases ,mathematical induction method, biconditional proof , vacuous proof , trivial proofs, disproof method by counter example , characterization. Eeneralisation & Simplification Techniques , Probabilistic Techniques , optimization Techniques	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	2	5	5	5	15	30	0	70	70	70

REFERENCE BOOKS:

- Proof in Mathematics : An Introduction , Jemes Frankilin ,Albert Daoud Quaker Hill Press.
- Journey into Mathematics :An introduction to proofs , Joseph J Rotman, Dover pub.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-IV</p> <p style="text-align: center;">Paper No: 1410900</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 4</p> <p>: Title of the paper:</p> <p style="font-size: 1.2em;">Philosophical Foundation of Education</p>
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Objective of the course:

- To student, intellectually with the basics of philosophy and philosophy education
- To enhance understanding of the student in terms of core aspects of philosophy of education
- To enhance students analytic faculty on philosophical is has and educational implications
- To make student familiar with the educational contribution of Indian educational thinkers
- To enhance understanding of students on basic branches of philosophy war Indian school of philosophy
- To develop critical awareness of philosophy of students in understanding education as systems, process and product with respect to philosophy

Unit	Sub Unit	Content	Credit									
1		<p><u>Philosophy and Philosophy of Education</u></p> <p>(1) nature and scope of philosophy (2) process of philosophizes and philosophical attitude</p> <p>Basic branches of philosophy (1) Metaphysics (2) epistemology (3) Axiology and core beliefs - educational implications.</p> <p>Philosophy and its relation to education and directive role of Philosophy to education Understanding curriculum, teaching -learning process teacher-learning relationship and discipline in Philosophical perspective</p>	1									
2		<p><u>Philosophical isms and education</u></p> <p>Concept of 'ism' and basic tenets of idealism, pragmatism and Existentialism natural Idealism naturalist pragmatist and Existentialist curriculum and consideration for teaching-learning relation and discipline process and teacher thought Educational, implication of idealism, pragmatism and Existentialism. Eclectic view of ism in education</p>	1									
3		<p><u>Indian school of philosophy and education</u></p> <p>Introduction to Indian view of education: Vedanta and educational aspects brief out line on concepts and educational implication. Sankhya and education brief out line on concepts and educational implication. Yoga and Education brief out line on concepts and educational implication. Buddhism Jainism and education brief out line on concepts and educational implication. Islamic System of education brief out line on concepts and educational implication.</p>	1									
4		<p><u>Indian Educational and Thinker Education</u></p> <p>(1) Mahatma Gandhi (2) Maharshi Arvind (3) Ravindranath Tagor (4) Pandit Dindayal Upadhyay</p>	1									
Assessment & Evaluation		Credit	Internal		External			Total O/o 70				
		Theory	Practical	Assignment	Project	Seminar	Test		Total	Theory	Practical	Total
		4	0	5	5	5	15	30	70	0	70	70

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Saxena, S.(2001) Philosophical and Sociological Foundations of Education. Meerut: Surya Publications.

Singh, B.N. (2005) Education: Social Change and Economic Development, Jaipur: RBSA Publishers.

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Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-IV</p> <p style="text-align: center;">Paper No: 1411000</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 4</p> <p>: Title of the paper:</p> <p>PRINCIPLES AND TECHNIQUES OF TEACHING</p>
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Objective of the course:

- To enable the students to understand process of instruction and its various components.
- To enable the students acquire knowledge about approach, Methods and techniques to instruction.
- To acquaint the students about planning of instruction.
- To enable the students to understand various methods, media and use of technology to strengthen the process of instruction
- To provide students with the knowledge of planning of instruction.
- To enable the students to understand the evolution and feedback for the process of instruction.

Unit	Sub Unit	Content	Credit
1		<p>Instruction : Meaning and concept</p> <p>Meaning of instruction</p> <p>Instruction as a complex and continuous process</p> <p>Prerequisites for instruction</p> <ul style="list-style-type: none"> ▪ Knowledge of the content or specific subject ▪ Knowledge of pedagogy ▪ Knowledge of learners and their characteristics ▪ Knowledge of curriculum ▪ Knowledge of educational goals and objectives <p>Slogans of instruction</p> <ul style="list-style-type: none"> ▪ From known to unknown ▪ From concrete to abstract ▪ From simple to complex ▪ From indefinite to definite ▪ From analysis to synthesis ▪ From particular to general <p>Maxims of instruction</p> <p>Learning by doing</p> <p>Principle of creating interest</p> <ul style="list-style-type: none"> ▪ Principle of inspiration ▪ Correlation with life ▪ Correlation with other subjects ▪ Principle of planning ▪ Principle of proper selection of depth of knowledge ▪ Principle of individual differences ▪ Principle of creation and joy ▪ Principle of democratic attitude ▪ Principle of recapitulation <p>Effectiveness of teaching</p>	1
2		<p>Approaches, Methods and Techniques</p> <p>Teachings skills and Techniques</p> <ul style="list-style-type: none"> ▪ Different skills of teaching and their components ▪ Integrated use of skills and its importance <p>Different approaches of instruction</p> <ul style="list-style-type: none"> ▪ Different approaches to instruction and their merits and demerits. <ol style="list-style-type: none"> a) Systems approach b) Input-process-output model c) Cognitive approaches: Inquiry training, concept Attainment, advance organizer models. ▪ Inductive approach ▪ Deductive approach ▪ Activity based approach ▪ Constructivist approach <p>Methods of instruction</p> <ul style="list-style-type: none"> ▪ Teacher -centered (Lecture cum discussion, Demonstration, Mastery learning strategy) ▪ Pupil-centered (Self study, Self discovery, Problem-solving, Experimentation, Programmed instruction/Programmed Learning) 	1

3	<ul style="list-style-type: none"> Group - centered (Group discussion, project method) Other special methods/Techniques of instruction (Heuristic method, Seminar, Panel discussion, Buzz session, Brain-storming, Symposium, Role-play, work-shop) Modes and media (Print, Audio-visual media, human interaction, Tele- conferencing, video-conferencing etc.)	1									
	Planning of Instruction Meaning, Logic and importance Kinds of planning Different models of planning Lesson plan, unit plan and annual plan. Content analysis and logical sequencing Formulating instructional objectives Different domains and their level. (Cognitive domain, Affective domain, Psychomotor domain) General objectives & specific objectives Reducing objective to behavioral terms.	1									
4	Educational Technology in Instruction and Evaluation Knowledge of various software and hardware & their implementation Media resource centre Mass-media as source of education Evaluation: Meaning and importance Formative and summative evaluation Continue and comprehensive evaluation Evaluation through E T Ways and means of Feedback	1									
Assessment & Evaluation	Credit	Internal	External			Total O/o 70					
			Sem. End Exam								
	Theory	Practical	Assignment	Project	Seminar		Test	Total	Theory	Practical	Total
	4	0	5	5	5	15	30	70	0	70	70

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- Aggarwal, J.C. (1985). Theory and Principles of Education, Philosophical bases of education. Vikas Publisher Bloom, Benjamin: Taxonomy of educational objectives: the classification of educational goals. New York, Longmans, Green, 1956
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Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-IV</p> <p style="text-align: center;">Paper No: 1411100</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Psychological Foundations of Education – 2</p>
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Objective of the course:

- To make the students aware of human mental abilities like intelligence, creativity, thinking, reasoning etc.
- To acquaint the students to know the nature of personality and personality development.
- To enable the learner to understand implications of theories of personality.
- To enable the students to understand factors affecting adjustment and mal adjustment.
- To enable the students to understand concept and various kinds of defense mechanism.
- To make the students to understand the concept of communication process.
- To make the students to apply knowledge of psychology in their personality development.

Unit	Sub Unit	Content	Credit
1		<p>Intelligence, Creativity, interest & Aptitude</p> <p>Intelligence:</p> <ul style="list-style-type: none"> • Meaning & definitions • Types of Intelligence • Intelligence Theories : Two-Factor, Group Factor, Multi-Factor, Guilford, Cattell, Vernon <p>Measurement of Intelligence:</p> <ul style="list-style-type: none"> • IQ: Meaning • Types of IQ Test • Uses and Limitations of IQ test • Introduction to various IQ tests available in Gujarati <p>Creativity:</p> <ul style="list-style-type: none"> • Nature and Characteristics • Stages of Development of Creativity • Suggestions to Develop Creativity of the Students <p>Interest & Aptitude:</p> <ul style="list-style-type: none"> • Meaning & Types of interest • Meaning & definitions of aptitude • Introduction to various interest inventory & aptitude tests 	1
2		<p>Theory of Personality</p> <p>Factors of Personality:</p> <ul style="list-style-type: none"> • The Id, Ego, Super Ego • Factors affecting Personality : Mind (Conscious, Pre Conscious, Unconscious) Oedipus Complex, Electra Complex, Sibling Rivalry • Stages of Personality Development <p>Jung's Theory of Personality:</p> <ul style="list-style-type: none"> • Basic Concepts of Jung's Theory of Personality : Racial or Collective Unconscious Mind, The Concept of Polarity, Concept of Equivalence, Concept of Entropy • Personality Characteristics • Functions & Types of Personality <p>Rogers' Theory of Personality:</p> <ul style="list-style-type: none"> • Assumptions of Rogers' Theory of Personality • Development of Personality • Fully Functioning Person <p>Erikson's Theory of Personality :</p> <ul style="list-style-type: none"> • Factors Affecting Personality : Ego, Social Factors Culture, Sexual Instincts, Childhood Experiences • Stages of Personality Development • Educational Implications 	1
3		Measurement of personality and Mental Health	1

4	<p>Measurement of personality :</p> <ul style="list-style-type: none"> • Subjective Methods of Personality Measurement • Objective Methods of Personality Measurement • Projective Methods of Personality Measurement <p>Adjustment & Mental Health :</p> <ul style="list-style-type: none"> • Meaning and Definition • Characteristics of well-adjusted persons • Factors affecting adjustment • Maladjustment: Reasons & suggestions to overcome mal-adjustment <p>Defense Mechanism:</p> <ul style="list-style-type: none"> • Meaning and Definition • Various defense mechanisms <p>Mental Health:</p> <ul style="list-style-type: none"> • Mental health & hygiene: Meaning & Definition • Factors affecting mental health • Characteristics of mentally healthy person 	1									
	<p>Group Dynamics Communication</p> <p>Group & Group Dynamics:</p> <ul style="list-style-type: none"> • Meaning & Definition • Characteristics & Types of human group • Factors affecting group dynamics • Educational Implications of group dynamics <p>Thinking:</p> <ul style="list-style-type: none"> • Meaning, Definition & Characteristics of Thinking • Types, Methods & Tools of Thinking • Essentials of Effective Thinking <p>Reasoning:</p> <ul style="list-style-type: none"> • Meaning, Definition & Characteristics of Reasoning • Kinds & Steps of Reasoning • Role of teacher in developing reasoning of students <p>Communication:</p> <ul style="list-style-type: none"> • Meaning, definition, Characteristics & main elements of Communication • Communication Process • Types of Communication • Factors Affecting Classroom Communication 										
Assessment & Evaluation	Credit	Internal	External			Total O/o 70					
	Theory	Practical	Assignment	Project	Seminar		Test	Total	Theory	Practical	Total
	4	0	5	5	5	15	30	70	0	70	70

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- Allport, G. W. (1960) **Personality – A Psychological Interpretation**. New York : Henry Holt and Co.
- Asthana, Bipin. (2009) **Measurement and Evaluation in Psychology & Education**. Agra : Agrawal Publications.
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- Gardner, H. C. (1983) **Frames of Mind : The Theory of Multiple Intelligence**. New York : Basic Books.
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- ભટ્ટ કુસુમબેન કે. (૧૯૯૬) વ્યક્તિત્વના સિદ્ધાંતો. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
 દેસાઈ કે. જી., સી. ટી., ભોપતકાર અને જી. અચૂ. શાહ (૧૯૮૧) મનોવેજ્ઞાનિક પારિભાષા અને
 વિભાવના. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
 દોગ્રા નનુભાઈ (૧૯૯૫) અધ્યાપન મનોવિજ્ઞાન. રાજકોટ: નેજીજન સાયકો સેન્ટર
 દોગ્રા નનુભાઈ, (૨૦૦૭) અધ્યયનનું મનોવિજ્ઞાન. રાજકોટ: નેજીજન સાયકો સેન્ટર.
 શાહ ગુણવંત (૧૯૭૮) અધ્યયન મિમાસા. રાજકોટ: નેજીજન સાયકો સેન્ટર
 શક્તિ સંતીશ પ્રકાશ, (૨૦૧૨) અધ્યતા સ્વરૂપ અને વિકાસ. આગરા અગ્રવાલ પ્રકાશન.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-IV</p> <p style="text-align: center;">Paper No:2411804</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Mathematics Credit:4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Introduction to Python</p>
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Objective of the course:

- To Understand the concept of programming in Python.
- To Develop the skills of obtaining various output through Programming in Python.
- To acquire Knowledge of Python Language.
- To Apply the knowledge of Python Language for any type setting problem.

Unit	Sub Unit	Content	Credit
1		Introduction to Python: Basic elements of python, Branching Programs, Control Structures, Strings and Input, Iteration.	1
2		Functions, Scoping and Abstraction: Functions and scoping, Specifications, Recursion, Global variables, Modules, Files, System Functions and Parameters	1
3		Structured Types, Mutability: Strings, Tuples, Lists and Dictionaries, Lists and Mutability.	1
4		Higher-Order Functions: Functions as Objects.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	4	5	5	5	15	30	0	70	70	70

REFERENCE BOOKS:

1. Python: Programming for Intermediates by Michael Knapp.
2. PYTHON: PROGRAMMING by Ramsey Hamilton.
3. Python: Programming for Advanced by Michael Knapp



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed. Semester-IV Paper No:2411914 Elective	Subject: Mathematic Credit: 4 : Title of the paper: Operation Research
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Objective of the course:

- To Understand the concept of Linear Programming & Transportation Problem & Assignment Problem.
- To Develop the skills of calculation of Linear Programming & Transportation Problem & Assignment Problem.
- To acquire the Knowledge of Operation Research.
- To Apply the knowledge of Operation Research for any real-time problem

Unit	Sub Unit	Content	Credit
1		Development- Definition Characteristics and Phases-Types of models- operation Research models- application. ALLOCATION: Linea programming Problem Formulation- Graphical solution – Siplax method- Artificial variables techniques Big M method Duality Principle.	1
2		TRANSPORTATION PROBLEM: Formulation- Optimal solution, unbalanced transportation problem- Degeneracy – Maximization case. ASSIGNMENT PROBLEM: Formulation Optimal solution – Variants of Assignment Problem.	1
3		THEORY OF GAMES: Introduction- Minimax (maximin)- Criterion and optimal strategy- Solution of games with saddle points- Rectangular games without saddle points- dominance principle- mX 2 & 2 X n games- graphical method	1
4		PROJECT MANAGEMENT (CPM & PERT) : Network concepts components - rules for network construction- critical path method (CPM) Project evaluation and Review Techniques (PERT) PRODUCTION SCHEDULING (JOB SEQUENCING) : Introduction, johnson’s algorithm for n jobs 2 machines, Johnson’s algorithm for N jobs m machines, 2 jobs m machines using graphical method.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

1. J. K. Sharma, “Operation Research- Theory and Application”, 4th Edition,, Macmillian Publishers India Ltd.
2. P Sankara Iyer “Operations Research “, Tata Mc graw hills.
3. Paul A. Jensen and Jonathan F. Bard “*Operations Research Models and Methods*” Published by John Wiley and Sons in 2003.
4. H. A. Taha – Operations Research – An Introduction, Macmillan Publishing Co., Inc.,New York.
5. Swarup, Gupta & Manmohan – Operations Research, Sultan Chand & Sons, New Delhi.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc., M.Ed. Semester-IV Paper No:2411924</p> <p style="text-align: center;">Elective</p>	<p>Subject: Mathematics Credit: 4</p> <p>: Title of the paper:</p> <p>Introduction to Coding theory & Cryptography</p>
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Objective of the course:

1. To Understand fundamental concepts of coding theory and cryptography.
2. To Develop the skills of developing and correcting various codes.
3. To acquire Knowledge of encryption
4. To Apply the knowledge of coding theory & Cryptography for any real-time problem.

Unit	Sub Unit	Content	Credit
1		Introduction and Classical Cryptography: The Setting of Private-Key Encryption, Historical Ciphers and Their Cryptanalysis The Basic Principles of Modern Cryptography: Principle 1 – Formulation of Exact Definitions, Principle 2 – Reliance on Precise Assumptions, Principle 3 – Rigorous Proofs of Security. Perfectly-Secret Encryption-Definitions and Basic Properties, The One-Time Pad (Vernam’s Cipher) Limitations of Perfect Secrecy, Shannon’s Theorem.	1
2		Public Key cryptography: Diffie-Hellmann key exchange, Discrete logarithm-based cryptosystems, RSA crypto-system, Signature Schemes, Digital signature standard, RSA Signature schemes, Knapsack problem. Introduction to elliptic curves, Group structure, Rational points on elliptic curves, Elliptic Curve Cryptography. Applications in cryptography and factorization, Known attacks.	1
3		Introduction to Coding theory: The communication channel, coding problem, types of codes- block code, error detecting and error correcting code, linear code, dual codes. Hamming metric, description of linear block codes by metrics. Error correction capability of linear codes.	1
4		Linear block codes, Hamming codes, Gray codes, perfect codes, quasi perfect codes, Reed – Muller codes. Product codes, Concatenated codes, Codes derived from Hadamard matrices.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

Raymond Hill, A first course in Coding Theory, Oxford University press 1990
 WW Peterson , E J Weldon, Error correcting codes, Cambridge press
 EN. Koblitz, A Course in Number Theory and Cryptography, Springer 2006.

L. C. Washington, Elliptic curves: number theory and cryptography, Chapman & Hall/CRC, 2003.

D. Hankerson, A. Menezes and S. Vanstone, Guide to elliptic curve cryptography, Springer-Verlag, 2004.



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc., M.Ed.</p> <p>Semester-IV</p> <p>Paper No:2412004</p> <p>Compulsory</p>	<p>Subject: Mathematics Credit: 2</p> <p>: Title of the paper:</p> <p>Foundation course on research in Mathematical sciences-4</p>
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Objective of the course:

- To understand the fundamentals of mathematical research.
- To develop skill of reasoning.
- To acquire the knowledge of mathematical methods.
- To apply the knowledge of mathematics in real-time problems.

Unit	Sub Unit	Content	Credit
1		What is research/ Science and research, basic and applied research, Essential steps in research, Characteristic of scientific research, Research and experimental design. Scientific Writing, Research Proposal, Research Paper, Review Paper, Thesis, Conference Report, Book Review and Project Report (any two)m, Reference Writing, Scientific Abbreviations. Preparation and Delivery of Scientific Presentations, Research Report/ Thesis Formatting and Typing (Computing), Title page, Certificate, Declaration, Acknowledgement, List of Table, Figures, Abbreviations and Symbols, Chapters Quotations, Table, Figures, Summary, Appendices, References etc. Plagiarism in Research.	1
2		Introduction to Statistics: Definition and scope, data collection, classification, tabulation of data and its graphical and diagrammatic presentation. Measures of central tendency, dispersion and standard error, Probability, distributions, binomial, Poisson and normal distribution. Statistical; significance: Hypothesis testing, types of error, level of significance, various test and Chi - square goodness of Fit, Simple linear regression and correlation analysis.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	2	5	5	5	15	30	0	70	70	70

REFERENCE BOOKS:

- 1) Guide to write scientific papers by Garson, G. D.
- 2) Research Methodology : Methods & Techniques , C R Kothari ,New age Publishers.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511300</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center; font-size: 1.2em;">: Title of the paper:</p> <p style="text-align: center; font-size: 1.2em;">Psychological Testing</p>
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Objective of the course:

- To enable students to develop an understanding of the nature of psychological measurement and its underlying principles.
- To acquaint students with the tools and techniques of psychological measurement, its nature, uses and limitations.
- To enable students to develop skills in the use of selected psychological test for the purpose of guidance and counseling.
- To enable students administration of psychological tests.
- To equip students with skills of writing report and communicating to the concern people.
- To equip students with the knowledge of practices of counseling.
- To enable students to acquire the knowledge regarding different techniques of counseling.
- To enable students to conduct case-study.

Unit	Sub Unit	Content	Credit								
1	1.1	Psychological Measurement	1								
	1.2	<ul style="list-style-type: none"> • Meaning, Nature and Scope • Difference between Psychological measurement and physical measurement • Need of psychological measurement in Guidance and Counseling 									
		Psychological testing:									
		<ul style="list-style-type: none"> • Meaning, nature and scope of Psychological measurement • Use of tests in guidance and counseling. 									
To sensitize students with various issues of Guidance and Counseling											
2	2.1	Techniques of psychological Measurement with reference to guidance and counseling	1								
	2.2	<ul style="list-style-type: none"> • Testing Techniques: Standardized tests, Teacher-made tests. • Non Testing Techniques : Observation, Personal Records, Rating Scale, Sociometric techniques, Projective techniques, Questionnaires, Interview, Inventories 									
3	3.1	Tools of Psychological Measurement	1								
	3.2	<ul style="list-style-type: none"> • Intelligence: IQ, MI and EQ, • Aptitude, • Interest, • Achievement, • Personality etc. 									
		Criteria for Test selection /Preparation									
		<ul style="list-style-type: none"> • Technical criteria: Reliability, Validity and norms • Practical criteria: Ease of Administration, cost, time. • Sources of Psychological Tests 									
4	4.1	Administration and Interpretation of result:	1								
	4.2	<ul style="list-style-type: none"> • Scoring and analysis of test result • Interpreting the test result in the light of Guidance and Counseling 									
		Reporting of test:									
		<ul style="list-style-type: none"> • Reporting the test results to students, teachers and parents. 									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70
		Sem. End Exam									
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	
2	2	5	5	5	15	30	70	0	70	70	

REFERENCE BOOKS:

- Super, D., (1990) In Gothard, B., Mignot, P., Offer, M., & Ruff, M. (2001) Careers Guidance in Context, London: Sage
- Watts, A.G., (1994) Lifelong Career Development, Towards a National Strategy for Careers Education and Guidance, CRAC Occasional Paper, Cambridge: CRAC
- Agrawal, R., (2006) Educational, Vocational Guidance and Counselling, New Delhi, Sipra Publication
- Bhatnagar, A AND Gupta, N., (1999). Guidance and Counselling: A theoretical Approach (Ed), New Delhi, Vikas Publishing House



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511400</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 4</p> <p>: Title of the paper:</p> <p style="color: red; font-weight: bold;"><i>Sociological Foundations of Education</i></p>
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Objective of the course:

- 1 To student, intellectually with the basics of sociology and sociology in education
- 2 To enhance understanding of the student in terms of core aspects of sociology in education
- 3 To enhance students analytic faculty on sociology and its educational implications
- 4 To make student familiar with how sociological impacts have influenced education and education as system
- 5 To enhance understanding of students on basic branches of sociology in education

Unit	Sub Unit	Content	Credit								
1		Foundations of sociology and education. Concept, nature and scope of Sociology of education Nature of Indian Society: Social and cultural changes in India and education Relevance and need of studying Sociology of education in contemporary India. Sociological concerns of education	1								
2		Contribution and Implications of selected Social thinkers. Max Weber - Main points of thinking and Sociological concerns. Habermas - Main points of thinking and Sociological Concerns. Dr. B.R.Ambedker - Main prints of thinking and Sociological concerns. VinobaBhave - Main points of thinking and Sociological concerns.	1								
3		Social stratification, education and role of education Concept of Social stratification. Social stratification and school life related aspects. School practices for social attitudes, emotional integration and national unity. Characteristics of 21 st century Society: Scientific thinking, globalization and social impact, community development.	1								
4		Socialization as process and education Concept of Socialization and process of Socialization. Institutions of Socialization, Home, School and Society. Role of educational institutions for social development of growing children. Sociological aspects of education in terms of equal opportunity in education and policy concerns.	1								
Assessment & Evaluation	Credit	Internal	External	Total O/o 70							
			Sem. End Exam								
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Theory	Practical	Total
	4	0	5		5	5	15	30	70	0	70
										70	

REFERENCE BOOKS:

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- Hanighurst, Robert et al. (1995) Society and Education, Boston: Allyn and Bacon.
- Kamat, A.R. (1985) Education and Social Change in India, Bombay Samaiya Publishing Co.,
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Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc., M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511510</p> <p style="text-align: center;">Optional</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Educational Management</p>
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Objective of the course:

- Students understanding the basic concept of administration. Management organization and resource management.
- To develop an insight into the educational management as a discipline.
- Students understand the approaches to educational management
- Student understands to the resource management its relationship with management administrator, Head teacher.
- Students understand the basic concept of IQM TQM practices. Innovations and activities.
- Students understand to micro planning for school management and its concept.
- Students understand the rule of management of in managerial perspectives .

Unit	Sub Unit	Content	Credit								
1		Basic Concepts. Concept of educational administration & management Development of management. Scope and function of educational administration management and organization. Leadership, role of leader in educational institution leadership quality and professional confidences of an educational administration. Management conceptual understanding school and classroom management.	1								
2		Micro planning for school management Scientific and system approach, human relations approach, Development of human resources Concept of micro and macro planning institutional planning principals and process School mopping, need, Factors and scope –Community participation in institutional planning Training (in service and preserves)	1								
3		Resource management and education institutional Meaning and concept of resource management Resource and their types: human, material (physical), Financial resources Management of human resources: Inter-personal, Inter-Group relation HOD, Teacher relationship, relationship with management and administered Development and human resources	1								
4		TQM in Educational management and Quality TQM concept, meaning, need and importance in educational institutions TQM practices: innovations and activities TQM for staff development and for quality enhancement NAAC's role in quality assessment Practical Visit any educational institution and note down the various types of resources Visit of good educational institution and note down a reason for a good education institute Visit a good administrator and take his interview and give an observation on it. Case study of any good educational institute Case study of any bad educational institute Observation about relationship with teacher and head of management Write an essay on 'good educational institute' Classify any one schools material resources Classify any one schools human resources Take one activities research of any school	1								
Assessment & Evaluation	Credit	Internal	External	Total O/o 70							
			Sem. End Exam								
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Theory	Practical	Total
	4	0	5	5	5	15	30	70	0	70	70



Indian Institute of Teacher Education, Gujarat.

M.Sc., M.Ed.

Semester-V

Paper No: 1511510

Optional

Subject: Education

Credit: 4

: Title of the paper:

Educational Management

REFERENCE BOOKS:

English

1. Anand W.P. Gurung, 'General Principles of Management for Educational Planner and Administrator', UNESCO, 1984.
2. Goeil S.D. Modern management Techniques new Delhi Deep and Deep 1987
3. M. Narula, Quality In School Education Secondary Education Board –A NUEPA 2010, New Delhi
4. T.K.D. Nair School Planning and Management 2009 , New Delhi
5. S.K. Bhatia, Training and Development 'concept and practices' Deep and Deep publication, New Delhi
6. Yazali Josephine, School resource planning and management - A NUEPA 2010, New Delhi
7. Mc-grath basic management skill for 8th addition (ISBN-978-81-203-3542-4) PHI learning pvt.Ltd. New Delhi
8. Hensley, Blanchard & Johnsons, management of organizational behavior leading human resources (9th additional) PHI learning pvt. Ltd. New Delhi
9. Mc-Grath J H planning system for school executives in text educational publishers Francisco, 1972
10. Peter G. north house leadership the ory and practice (south Asian Reprint) 5007 sage India and anstar
11. Total quality management Dr. Mukhopadhyay

Gujarati

1. શાળા સંચાલન બી.એસ. પ્રકાશન - અમદાવાદ
2. શૈક્ષણિક વ્યવસ્થાપન – વાઘેલા ઈશ્વરભાઈ તથા દિપિકા મહિડા
3. શૈક્ષણિક વ્યવસ્થાપન પ્રકાશક- માધ્યમિક શિક્ષણ બોર્ડ સહલેખકો –ડૉ. એ.બી. કગથરા, ડૉ.પલ્લવી પટેલ અને ડૉ. હરિભાઈ પટેલ



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511520</p> <p style="text-align: center;">Optional</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center; font-size: 1.2em;">: Title of the paper:</p> <p style="text-align: center; font-size: 1.2em;">Measurement and Evaluation</p>
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Objective of the course:

- Understand the concepts and procedure of measurement and evaluation.
- Differentiate the Classical Test Theory and Item Response Theory.
- Understand the techniques of developing instructional objectives.
- Understand the nature and uses of different type tests.

Unit	Sub Unit	Content	Credit
1		<p>The measurement and evaluation Process & Theories of measurement</p> <p>1.1 Meaning of Educational Objectives, Learning Experiences and Learning outcomes</p> <p>1.2 Concept and need of evaluation, Inter relationship between measurement and evaluation</p> <p>1.3 Functions of evaluation & Basic principles of evaluation</p> <p>1.4 Classical Test Theory(CTT) : Concept, Characteristics and Importance</p> <p>1.4 Item Response Theory(IRT): Concept, Characteristics and Importance</p> <p>True scores and Errors of Measurement, Marks and Grades</p>	1
2		<p>Objectives & Norm-Referenced and Criterion-Referenced Test</p> <p>2.1 Defining Objectives & Relating evaluation to objectives</p> <p>2.2 Taxonomy of educational objectives: Cognitive Domain Affective domain, Psychomotor domain</p> <p>2.3 Concepts of Norms Referenced and Criterion referenced Test Difference between NRT and CRT</p> <p>2.4</p> <p>2.5 Steps for constructions of Criterion-Referenced Test : Instructional intent specifying the domain, item development, item review and test development.</p> <p>Types of tests: Achievement Test, Diagnostic Test, Domain-Referenced Test</p>	1
3		<p>Tools of measurement and evaluation and standardized tests</p> <p>3.1 Subjective and objective tools; Scales, Questionnaires, Schedules</p> <p>3.2 Supply type questions: Simple question, completion question, short answer question, long answer question/essay questions (Characteristics, merits, limitations and improvement of each type).</p> <p>3.3 Selection type question: constant alternative, multiple choice, matching, Re-arrangement. (Characteristics, merits, limitations and improvement of selection type item).</p> <p>3.4 Nature and use of standardized test.</p> <ul style="list-style-type: none"> • Criteria for selecting a good standardized test : planning, reliability, validity, objectivity, Discriminating power, Adequacy, Usability and Comparability. • Criteria for selecting a good standardized test : planning, reliability, validity, objectivity, Discriminating power, Adequacy, Usability and Comparability. 	1
4		<p>Process of Standardizing a test.</p> <p>4.1 Steps involved in standardization of a test.</p> <p>4.2</p> <ul style="list-style-type: none"> • Reliability: Concepts and types of reliability. • Validity: Concept and types of validity. <p>4.3 Standard Scores and Norms : Z-score, t-score, stanine, Letter Grade, Percentile Rank.</p> <p>4.4 Emerging trends Semester System and Grading : Concept and process of grading</p> <p>Open text-book Examination, Question Bank : Meaning, Importance steps for construction, Use of computer in evaluation, Adaptive (Tailored) Testing</p>	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

English

- Aggarwal, Y.P. (1990). *Statistical Methods - Concept, Application and Computation*. New Delhi : Sterling Publishers Pvt. Ltd.
- Agarwal, R.N. (1991). *Measurement and Evaluation in Psychology and Education*. Agra : Vinod PustakMandir.
- Anne Anastasi. (1976). *Psychological Testing* (Forth Edition). New York : Mac-Millan Publishing Co.
- Bloom, B.S. (1956). *Taxonomy of Educational Objectives : Cognitive Domain*. New York : David Mc Kay Co.
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- Krathwohl, (1964). *Educational Objectives. Affective Domain-Book II*. New York: David Mckay Co.
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- Singh, Pritam. *Criterion Referenced Testing : A Monograph*. New Delhi : NCERT Publication.
- Sternberg, Robert J. and Grigorenko, Elena L. (2002). *DynanicTesting : The Nature and Measurement of Learning Porential*. New York : Cambridge University Press, 40 West 20 Street, NY-10011-4211-USA
- Tabachnick, Barbara G. and Fidell, Linda S. (1989). *Using Multivariate Statistics* (2nd Edn.) New York : Harper & Row Publishers.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511530</p> <p style="text-align: center;">Optional</p>	<p>Subject: Education Credit: 4</p> <p>: Title of the paper:</p> <p style="font-size: 1.2em;">Yoga Education</p>
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Objective of the course:

- To enable the students to understand concept and process of educational psychology as an applied science.
- To acquaint the learner with the process of development and assessment.
- To enable the learner to understand implications of psychological theories of learning.
- To make the students understand the concept of learning acceleration, learning curve and plateaus of learning curve and their educational implications.
- To enable the students to understand theories of motivation and their educational implications.
- To make the students to understand the concept of information processing.
- To make the students to apply knowledge of psychology in their personal & cognitive development.

Unit	Sub Unit	Content	Credit										
1		Yoga (Meaning and relevance) Yoga and Modern life (Introduction, Definition and Understanding yoga) The yoga of concentration and meditation The role of yoga in healthy living and science of life force	1										
2		Health and Lifestyle Food and Health Method of Pranayama Pranayama and Mudras	1										
3		Standing Postures:- 1) Ardhakati chakrasana 2) Ardha chakrasana 3) Pada Hastasana 4) Trikonasana	1										
4		Sitting Postures:- 1) Vajrasana 2) Sansankasana 3) Panchimotanasana 4) Ustrasana 5) Vakrasnan 6) Ardh matsyendrasana 7) Mayurasana Supine Postures :- 1) Sarvangasana 2) Matyasana 3) Halasana 4) Charkrasana	1										
Assessment & Evaluation	Credit	Internal	External	Total O/o 70									
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Sem. End Exam				
										Theory	Practical	Total	

REFERENCE BOOKS:

- Yoga its philosophy and practice: Swami Ramdev
- Pranayama Rahasya : Swami Ramdev
- Aushadh darsan : Swami Ramdev
- Rajrshi muni : Yoga Darshika
- Maharshi Arvind : soul development through yoga, www.pathofdivinelife.org
- Yoga – Its philosophy & Practice - Swami Ramdev



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511600</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 2</p> <p>: Title of the paper:</p> <p>Preparation and Administration of Psychological Tests</p>
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Objective of the course:

- To enable students to review psychological test.
- to understand psychological testing.
- to administer psychological test.

Unit	Sub Unit	Content	Credit
1		Understanding psychological tests.	0.5
		Selecting appropriate psychological tests.	0.5
		Administering psychological tests.	0.5
		Interpretations of data received from testing.	0.5

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	2	10	10	10	20	50	0	0	0	0

REFERENCE BOOKS:

- Anastasi, A. Psychological Testing, (7th Ed.), New York: Macmillan Publishing Co.
- Buros, D.K.(Ed.), (1972). The Seventh Mental Measurement Year Book, Highland Park, N.J.Gryphon Press
- Cronbach, L. J. (1982). Essentials of Psychological Testing, New York: Harper (3rd Ed.)
- Freeman, F.S. (1980). Theory and Practice of Psychological Testing, New Delhi: Oxford and IBH Co.
- Garrett, H.E. (1985). Statistics in Psychology and Education, Bombay: Vakils, Feffer and Simons Pvt. Ltd.,
- Helmstaller, G.C. (1966). Principles of Psychological Measurement, London: Methuen Co.Ltd.
- Long, L. and Menta, P.H. (1966). The First Measurement Handbook for India, New Delhi; NCERT
- Nunnally, J.C. (1967). Psychometric Theory, New York: McGraw Hill Book Inc.
- Nunnally, J.C. (1972). Educational Measurement and Evaluation, New York: McGraw Hill
- Pareek, U. and Sound, S., (1971). Directory of Indian Behavioural Science Research, Delhi; Acharan Sahakar
- Patel, R.S., (2010). Psychological Testing, Ahmedabad: Jay Publication
- Super, D.E. and Crites, J.C., Appraising Vocational Fitness by Means of Psychological Tests.



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-V</p> <p style="text-align: center;">Paper No: 1511700</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 2</p> <p>: Title of the paper:</p> <p>Preparing Theme Papers and its Presentation</p>
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Objective of the course:

- To think about topics on which they can prepare theme papers.
- To prepare presentations on theme papers.
- To present theme papers to seminar or workshop.

Unit	Sub Unit	Content	Credit								
1		To work in group for identifying topics on education.	0.5								
		To refer the material from various sources.	0.5								
		To write papers in different styles.	0.5								
		To present the paper in seminar or workshop arranged for the purpose.	0.5								
Assessment & Evaluation	Credit	Internal	External	Total O/o 70							
			Sem. End Exam								
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Theory	Practical	Total
	0	2	10		10	10	20	50	0	0	0

REFERENCE BOOKS:

- Mla Handbook for Writers of Research Papers Paperback – 1 Dec 2008, by Mla (Author) , Affiliated East-West Press
- The Curious Researcher: A Guide to Writing Research Papers Paperback – Import, 22 Jun 2000, by Bruce Ballenger (Author) , Pearson Publication
- Research Methodology: A Theoretical Approach Paperback – 2014 by D. Na polean (Author), B. Balaji Sathya Narayanan , Laxmi Publications
- Practical Approach to Research Methodology Paperback – 2005 by S. P. Verma (Author) , Akaasha Publishing
- Research Methodology: A Guide for Researchers in Management and Social Sciences Paperback – 2006, by Taylor, Sinha, Ghoshal, (Author), Prentice Hall India Learning Private Limited; 1st Edition edition (2006)



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<p>M.Sc.,M.Ed.</p> <p>Semester-V</p> <p>Paper No: 114</p> <p>Compulsory</p>	<p>Subject: Education Credit: 2</p> <p>: Title of the paper:</p> <p>Internship</p>
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Objective of the course:

- To understand educational system through personal experience.
- To develop the habit of observation and to relate it to knowledge.

Unit	Sub Unit	Content	Credit								
1		Internship in Teacher education institutions	2								
Assessment & Evaluation	Credit		Internal					External			Total O/o 70
								Sem. End Exam			
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	
	0	2	10	10	10	20	50	0	0	0	0

REFERENCE BOOKS:

- Becoming Better Teacher Microteaching Approach, Developed at the Centre of Advanced Study in Education, the M.S. University of Baroda, Baroda
- Practice Teaching: A Reflective Approach, Jack C. Richards, Thomas S. C. Farrell, Cambridge University Press, 14-Mar-2011 - Foreign Language Study
- Approaches and Methods in Language Teaching, Jack C. Richards, Theodore S. Rodgers, Cambridge University Press, 16-Apr-2014 - Foreign Language Study - 410 pages
- The Practice of Teaching, Philip Wesley Jackson, Teachers College Press, 1986 - Education - 159 pages
- A Guide to Teaching Practice: 5th Edition, By Louis Cohen, Lawrence Manion, Keith Morrison, Dominic Wyse
- Ernest stringer(1999)action research in education
- Jean,Mc niff, action research: principals and practice



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed. Semester-V Paper No:2512104 Compulsory	Subject: Mathematics Credit: 4 <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Calculus of Variations and Integral Equations</p>
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Objective of the course:

1. To Understand Calculus of variations and integral equations.
2. To Develop the skills of deriving some classical differential equations by using principles of calculus of variations.
3. To acquire Knowledge of Variational Problems, Euler-Lagrange Condition, Second Variation, Generalizations of the Variational Problem.

Unit	Sub Unit	Content	Credit
1		Euler Equations and Variational Notations: Maxima and minima, method of Lagrange multipliers, the simplest case, Euler equation, extremals, stationary function, geodesics, Brachistochrone problem, natural boundary conditions and transition conditions, variational notation, the more general case.	1
2		Advanced variational problems: Galerian Technique, the Rayleigh-Ritz method.	1
3		Linear integral equations: Definitions, integral equation, Fredholm and Volterra equations, kernel of the integral equation, integral equations of different kinds, relation between differential and integral equations, symmetric kernels, the Green's function. Methods for solutions of linear integral equations: Fredholm equations with separable kernels, homogeneous integral equations, characteristic values and characteristic functions of integral equations, Hilbert-Schmidt theory, iterative methods for solving integral equations of the second kind, the Neumann series.	1
4		Practical Based on: <ol style="list-style-type: none"> 1. Maxima and Minima 2. Method of Lagrange Multipliers 3. Extremals 4. Finding out Variational Forms 	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

1. F.B. Hildebrand, Methods of Applied Mathematics, New York: Dover, 1992.
2. R.P. Kanwal, Linear Integral Equations: Theory and Techniques, New York: Birkhäuser, 2013.
3. B. Dacorogna, Introduction to the Calculus of Variations, London: Imperial College Press, 2004.
4. F. Wan, Introduction to the Calculus of Variations and Its Applications, New York: Chapman/Hall, 1995.
5. J. Jost and X. Li-Jost, Calculus of Variations, Cambridge: Cambridge University Press, 1998.
6. C. Corduneanu, Integral Equations and Applications, Cambridge: Cambridge University Press, 2008.
7. A.J. Jerry, Introduction to Integral Equations with Applications, 2nd ed., New York: John Wiley & Sons, 1999.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed. Semester-V Paper No:2512214</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Mathematics</p> <p style="text-align: center;">: Title of the paper: Mechanics</p>	<p>Credit: 4</p>
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Objective of the course:

1. To Understand fundamental concepts in mechanics.
2. To Develop the skills for formulating and solving problems.
3. To acquire Knowledge of Lagrangian and Hamiltonian Concepts Dynamics.
4. To Apply the knowledge of Mechanics for any real-time problem.

Unit	Sub Unit	Content	Credit
1		Constrained Motion: Constraints, their classification, examples, principle of virtual work, D'Alembert's principle, Lagrange's equations.	1
2		Lagrangian Formulation: Degrees of freedom, Generalized coordinates, Lagrange's equations of motion of the second kind, properties of kinetic energy function. Generalized momenta and energy, Gauge function, cyclic or ignorable coordinates, integral of motion, concept of symmetry, invariance under Galilean transformations, Lagrangian for free particle motion.	1
3		Hamilton's equations of motion: Legendre transformation, Hamilton's equations of motion, Routhian, Configuration Space, Phase, State Space examples.	1
4		The Poisson Bracket: Definition, Some identities, elementary Pbs. Poisson's theorem, Jacobi-Poisson theorem on PBS. Invariance of PB under canonical transformations.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

- 1) Classical Mechanics by H. Goldstein, 2nd Edition, Narosa Publishing House
- 2) Classical Mechanics by C. R. Mondal, Prentice Hall of India Pvt. Ltd.
- 3) Rana and Joag : Classical Mechanics : Tata McGraw Hill Publishing Company Limited.
- 4) Landau and Lifshitz : Mechanics (Pergamon Press).
- 5) Greenwood : Classical Dynamics (Prentice-Hall).



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed. Semester-V Paper No:2512224 Elective	Subject: Mathematics Credit: 4 : Title of the paper: Relativity
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Objective of the course:

1. To Understand fundamental concepts in Relativity.
2. To Develop the skills for formulating and solving problems.
3. To acquire Knowledge of Lorentz transformation, Schwarzschild solution & its consequences,

Unit	Sub Unit	Content	Credit
1		Newtonian Relativity Lorentz transformation, Michelson – Morley experiment.	1
2		Length Contraction, Time dilation, Relativistic law of addition of velocities, Equivalence of mass and energy, Problems related to above topic.	1
3		The Schwarzschild solution and its consequences, experimental tests of General Relativity: The Schwarzschild solution, The Schwarzschild solution in isotropic co-ordinates, The General Relativistic Kepler problem and the perihelion shift of Mercury. The trajectory of light ray in Schwarzschild field. The Schwarzschild radius, Kruskal co-ordinates and the Black hole.	1
4		Tensor Algebra, Vector field in affine and Riemann space. Christoffel Symbols. Tensor Analysis.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

- 1) **“Special Relativity”** by W. Rindler. Pub.: Oliver and Bosed.
- (2) **“Introduction to General Relativity”** by R. Adler, M. Basin, M. Schiffer. Pub.: Mc.Graw Hill Kogakusha Ltd.
- (3) The Special theory of Relativity – Benerji and Benarjee. Pub.: Prentice Hall India Ltd.
- (4) Essential Relativity – W. Rindler. Pub. Springer Verlag.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-VI</p> <p style="text-align: center;">Paper No: 1612000</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education</p>	<p style="text-align: right;">Credit: 4</p>
<p>: Title of the paper:</p> <p>TEACHER EDUCATION</p>		

Objective of the course:

- To acquaint the students with the concept, objectives and types of Teacher Education.
- To acquaint the students with the historical background of Teacher Education in India.
- To enable the students to realize the place of teaching as a profession in the community.

Unit	Sub	Content	Credit																		
1.	Unit	To enable the students to understand the role and responsibility of various organizations in Teacher Education.																			
1		<p>Concept of Teacher Education & Teacher Education in India : Historical Perspective Meaning of Teacher Education; Purpose and Objectives of Teacher Education at various stages (Pre-School, Primary Stage, Secondary and Higher Secondary) Types of Teacher Education: Pre-Service , In Service</p> <ul style="list-style-type: none"> ○ Teacher Education in Ancient India ○ Teacher Education in Pre-Independence Period ○ Teacher Education in Post Independence Period <p>Teacher Education as perceived in NPE – 1986 and NCFTE – 2009</p>	1																		
2		<p>Teaching As a Profession & Role and Responsibility of various organizations in Teacher Education Characteristics which make teaching a Profession; Responsibilities of the teachers in the teaching profession & Preparation of professional personnel Research and development in teaching profession Teaching Profession in the future decade Role of Organisations like:</p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">1</td> <td>UGC</td> <td style="text-align: center;">4</td> <td>IITE</td> <td style="text-align: center;">7</td> <td>CASE</td> </tr> <tr> <td style="text-align: center;">2</td> <td>NCERT</td> <td style="text-align: center;">5</td> <td>SCERT</td> <td style="text-align: center;">8</td> <td>IASEs</td> </tr> <tr> <td style="text-align: center;">3</td> <td>NCTE</td> <td style="text-align: center;">6</td> <td>CTEs</td> <td style="text-align: center;">9</td> <td>DIETs</td> </tr> </table>	1	UGC	4	IITE	7	CASE	2	NCERT	5	SCERT	8	IASEs	3	NCTE	6	CTEs	9	DIETs	1
1	UGC	4	IITE	7	CASE																
2	NCERT	5	SCERT	8	IASEs																
3	NCTE	6	CTEs	9	DIETs																
3		<p>Teacher Education in India Organizational Patterns D.Ed. /P.T.C.; B.El.Edu.; B.Ed. (1 Yr. , 2 Yrs., 4 Yrs. Integrated course); B.Ed. (Basic Education); D.P.Ed.' B.P.Ed.; B.Ed. (Special Education); B.Ed. through Distance Mode; M.Ed. (Full time, Part time, Distance mode) Broad Organizations of Teacher Education Admission Process, Planning and Scheduling of Course Curriculum components -</p> <ul style="list-style-type: none"> i. Foundation Courses ii. Content cum mythologist iii. Special Areas iv. Practice Teaching v. Practical Work <p>Limitations of Teacher Education with respect to organization</p>	1																		
4		<p>Research, Problems, Innovations and Issues in Teacher Education</p> <ul style="list-style-type: none"> • Research Trends in Teacher Education • Micro Teaching, Models of Teaching, Simulation, Demonstration, Criticism lesson • Competency Based Teacher Education • Innovations in Curriculum development • Innovations in evaluation process • Quality v/s Quantity • Content cum Methodology • Integration of theory and practice • Curricular concerns in teacher education: [ICT, life skills, joyful learning, value education etc.] • Integration of various components as envisaged in NPE - 1986 , NCF - 2000 and 2006, NCFTE – 2009 • Preparing teachers for single teacher schools/ multi-grade classrooms 	1																		

• Teacher Performance Appraisal

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

Smith, E.R. (1962). Teacher Education. A Reappraisal. New York : Harper Row Publishers.

Stinnet, T.M. (1965). The Profession of Teaching, New Delhi : Prentice Hall of India (Pvt.) Ltd.

Chaurasia, G. (1967). New Era in Teacher Education. New Delhi : Sterling Publishers.

Mukerji, S.N. (1968). Education of Teachers in India (vol. I and II) New Delhi: Sultan Chand and Co.

Stone, J.C. (1970). Breakthrough in Teacher Education. San Francisco : Jossey Bass Inc.

John, M.N. (1971). Towards Accountable Teachers, their appraisal and Improvement. New York : Holt, Hart Rine and Winston.

Bose, K. and Srivastava, R.C. (1973). Theory and Practice. Teacher Education in India. Allahabad : Chug Publication.

Saxena, P.C.(1984). An Analytical Study of Teacher Education in India. Allahabad : Amitabh Prakashan.

Rao, D. (2002). Teacher Education in India, New Delhi : Discovery Publishing House.

Mangla, S. (2002). Teacher Education- Trends and Strategies, New Delhi: Sage Publishers.

Rao, D. (2003). Teachers in a changing world. New Delhi : Discovery Publishing House.

Sharma, R.A. (1999). Teacher Education. Meerut. Loyal Book Depot.

Sharma, S.P. (2003). Teacher Education. New Delhi : Kanishka Publishers (Pvt.) Ltd.



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed. Semester-VI Paper No: 1612110 Optional	Subject: Education Credit: 4 : Title of the paper: Guidance and Counselling
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Objective of the course:

- To help student to understand concept, need and view point of guidance.
- To help student to understand principles, and problems of different types of guidance.
- To acquaint the student with the aim and principles of guidance program.
- To develop in student an understanding of various procedures of organizing various guidance services .
- To get acquainted with the organizational framework and procedures of Guidance services in educational institutions.
- To enhance knowledge base of the students on the guidance services globe over.
- To help student to understand the establishment of a guidance centre.
- To understand the role of Guidance Personnel and Counselor in different context of Guidance Services .
- To help student to know the concept and needs and guidance for the children with special needs .
- To know and use the agencies for providing guidance and counseling services to students.

Unit	Sub Unit	Content	Credit
1		Nature and Scope of Guidance <ul style="list-style-type: none"> • Misconception of Guidance • Nature and Scope • Meaning and Definition of Guidance • Characteristics of Guidance The need for Guidance <ul style="list-style-type: none"> • Changing conditions of home, society, population, labour and industry, leisure time • Changing religion and moral values • Individual needs Principles and Basic Assumptions in Guidance Types of Guidance <ul style="list-style-type: none"> • Educational Guidance: Concept, needs and Characteristics • Vocational guidance :Concept, needs and Characteristics • Personal Guidance: Concept, needs, and Characteristics • Individual and Group Guidance: <ul style="list-style-type: none"> • Purpose and Program • Techniques of Group Guidance: Panel Discussion, Seminar, Exhibition, Career talk, Career Conference etc. 	1
2		Organizational Patterns for Guidance Services <ul style="list-style-type: none"> • Organization of Guidance program: Need, Nature and Objectives • Principles of Organization • Responsibilities of guidance Personnel Organizing Basic Guidance Services <ul style="list-style-type: none"> • Orientation/ Induction Service • Individual Inventory service • Information Service • Counseling Service • Placement Service • Follow-up Service Evaluation of Guidance Services: Need, Criteria and techniques of evaluation Administration of Guidance Services <ul style="list-style-type: none"> • Administrative relationship • Planning and Executing Guidance Service Establishment of Guidance Centre <ul style="list-style-type: none"> • Need • Objectives • Infrastructure • Guidance services • Modes of functioning Status of Guidance Services Globe Over <ul style="list-style-type: none"> • Scenario Building • Face to Face and On line guidance service Institutions providing various Guidance Services <ul style="list-style-type: none"> • Government • NGO • Private 	1

3	Web services							1			
	Counseling: <ul style="list-style-type: none"> • Concept and Nature, • Principles of counseling. • Counseling Process Counseling approaches: <ul style="list-style-type: none"> • Directive, • Nondirective and • Eclectic Types of Counseling: <ul style="list-style-type: none"> • Group counseling vs. individual counseling. • Counseling for adjustment Characteristics: <ul style="list-style-type: none"> • Characteristics of good counseling. 										
4	Counseling Process: <ul style="list-style-type: none"> • Preparation for Counseling • Counseling skills • Factors affecting Counseling process. • Case study and Case conference: Purpose, Plan, Procedures, and Precautions Group Counseling: <ul style="list-style-type: none"> • Introduction and assumptions in group Counseling • The process of group Counseling • Values of group Counseling • Limitations of group Counseling Preparation and Training for Counseling <ul style="list-style-type: none"> • Academic preparation • Qualities of a good Counselor • Professional Ethics for Counselor Problems and Issues <ul style="list-style-type: none"> • Organization and Administration of Guidance and Services • Guidance services for Special Groups • Changing roles of functionaries 							1			
Assessment & Evaluation	Credit		Internal				External			Total O/o 70	
							Sem. End Exam				
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical		Total
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- Super, D., (1990) In Gothard, B., Mignot, P., Offer, M., & Ruff, M. (2001) Careers Guidance in Context, London: Sage
- Watts, A.G., (1994) Lifelong Career Development, Towards a National Strategy for Careers Education and Guidance, CRAC Occasional Paper, Cambridge: CRAC
- Agrawal, R., (2006) Educational, Vocational Guidance and Counselling, New Delhi, Sipra Publication
- Bhatnagar, A AND Gupta, N., (1999). Guidance and Counselling: A theoretical Approach (Ed), New Delhi, Vikas Publishing House
- Jones, A.J., (1951). Principles of Guidance and Pupil Personnel work, New York, McGraw Hill
- Kochhar, S.K., (1985): Educational and Vocational Guidance in Secondary Schools, New Delhi, Sterling Publisher
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- Chauhan, S.S., (1978) Principles and techniques of guidance New Delhi, Vikas publishing House.
- Meyers, G.E., (1941) Principles and techniques of vocational guidance, New York: McGraw Hill.
- Sharma, Ram Nath & Sharma Rachana, (2004). Guidance and counseling in India. New Delhi: Atlantic Publishers and Distributors.
- Sharma, Shashi Prabha (2004). Career Guidance and counselling. New Delhi: Kanishka Publishers, Distributors.



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-VI</p> <p style="text-align: center;">Paper No: 1612120</p> <p style="text-align: center;">Optional</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Curriculum Development</p>
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Objective of the course:

- Develop to think Explain meaning of curriculum
- Explain Meaning of Curriculum development
- Describe determinants of curriculum.
- Discuss principles of curriculum Development.
- Differentiate steps of curriculum as envisaged by various authors.
- Critically comment on various issues of curriculum development
- Discriminate between formative & summative evaluation

Unit	Sub Unit	Content	Credit
1		<p><u>Concept of curriculum Development</u></p> <p>Meaning of curriculum (Course , syllabus, curriculum)</p> <p>Determinants of Curriculum</p> <ol style="list-style-type: none"> 1. Objectives & Philosophy Of Education 2. Society & Culture 3. Psychology Of Learning 4. Function Of Schools 5. Learner And Knowledge. 6. Impact Of Science & Technology <p>Meaning of Curriculum Development – relationship of various aspect of curriculum like objectives, content, methods, learning, experiences and evaluation.</p> <p>Principles of curriculum development</p> <ol style="list-style-type: none"> 1. Activity Principle 2. Forward looking principle 3. Society centered curriculum 4. Principles of integration 5. Creative principle 	1
2		<p><u>Steps of curriculum development</u></p> <p>Situation Analysis</p> <p>Diagnosis of needs</p> <p>Formulation of objectives</p> <p>Selection & organization of content</p> <p>Selection & organization of learning experiences</p> <p>Evaluation</p> <p>Various models suggested by Hilda Taba, Nicholls & Nicholls, Tyler wiles and Bondi.</p>	1
3		<p><u>Curriculum Evaluation</u></p> <p>Concept and need of Curriculum Evaluation</p> <p>Formative Evaluation</p> <p>Summative Evaluation</p> <p>Collection of data on which evaluation is based –collective evidences from various stake holders</p> <p>Feedback mechanism for curriculum evaluation</p> <p>Ways to improve curriculum based on evaluation.</p>	1

4	<p><u>Issues in curriculum Development</u> Centralised vs. percentralised curriculum, Local vs. Global (1) Diversity in culture (2) Teacher and their competence? Who should design curriculum schools, university, government or other bodies like NCERT, SCERT, UGC Issues of Transaction curriculum (1) explosion of knowledge, (2) Advance of science & technology. (3) Impact of various documentation on curriculum like NPE1986, NCF (2000) NCF 2005, NCFTE (2009)</p>										1
Assessment & Evaluation	Credit		Internal					External			Total O/o 70
								Sem. End Exam			
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- 1 Aggrawal, J.C. & Gupta S. (2000). Curriculum Development: New Delhi :Shipra Pub.
- 2 Arora, G.L. (1984). Reflection in curriculum, New Delhi, NCERT.
- 3 Caswell, H.L. and Campbell, D.S. (1935). Curriculum Development, N.Y. : Americal Book Co.
- 4 Darji, D.R. and Lulla B.P. (1967). Curriculum Development in secondary schools of Baroda. Baroda :Sadhana Press.
- 5 Deshmukh, V. (Ed., 2012). Winds of Reforms in Indian Education. New Delhi, Allantic.
- 6 John Dewey (1902). The Child and The curriculum. Chicago : University of Chicago.
- 7 Nicholls, A. and Nicholls, S. (1972). Developing a curriculum: A practical guide. London George Allen & Unwin Ltd.
- 8 Saylor, J.G. and Alexander W.M.(1974). Planning curriculum for schools. N.Y.: Holt, Richard and Winston. Inc.
- 9 Sharma, S.R. (1999). Issues in curriculum administration. New Delhi: Pearl Pub. House.
- 10 Sharma, R. (2002). Modern methods of curriculum organization Jaipur : Book Enclave.
- 11 Srivastava, H.S. (2006). Curriculum & methods of Teaching. New Delhi: Shipra pub.
- 12 Taba Hilda (1962). Curriculum Development: Theory and practice. N.Y. Harcourt, Brace & world Inc.
- 13 Tyler, R.M. (1950). Basic principles of Curriculum Development. Chicago: University of Chicago press.
- 14 Wiles, J. and Bondi, J., (1989). Curriculum Development, A Guide to practice. London: Merrill Pub. Co.
- 15 Smith, S. and Shores, S. (1972). Fundamental, of curriculum Development. N.Y.: Harcourt, Brace & world Inc.
- 16 દેસાઈડી.બી. અનેદેખતાવાલા,પી.બી. (૧૯૮૫)

અભ્યાસક્રમના સિધ્ધાંતો અને અભ્યાસક્રમ સંરચના અમદાવાદ : યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ.



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-VI</p> <p style="text-align: center;">Paper No: 1612130</p> <p style="text-align: center;">Optional</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Education Statistics</p>
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Objective of the course:

- Develop to think Explain meaning of Education Statistics
- Explain Meaning of Inferential and descriptive aspects Education Statistics
- Describe determinants of data and data analysis
- Discuss principles computing
- Differentiate steps of analyzing data and interpretations
- Computing measures and its relation to deciding about inferential statistics
- Understanding role of educational statistics in educational research

Unit	Sub Unit	Content	Credit								
1		<p>Statistics in Education Meaning, Scope, Need and Significance of Educational Statistics; Application of Educational Statistics in Edu. Research; Measures; Scales (Nominal, Ordinal, Interval, Ratio) Classification, Tabulation and Graphical presentation of Data; Measures of Central Tendency and Variability (Merits, demerits, uses and computations)</p> <ul style="list-style-type: none"> • Measures of central tendency • Measures of variability: 	1								
2		<p>Norms and Probability Normal probability curve, skewness, kurtosis Correlation, Regression & Statistical inference Correlation: Meaning, Calculating and Interpreting Coefficient of Correlation Regression: Meaning, Regression line and equation, Prediction, Standards error, etc. Significance of mean, Standard error, etc. α error and β error, Significance of mean difference, etc.</p>	1								
3		<p>Inferential Statistics ANOVA and ANCOVA; Analysis of variance (One-way, Two-way, Three-way), and Analysis of Co-variance and Factorial Design (No Computation) Its Uses (ANOVA and ANCOVA) Special Methods of Correlation; Bi-serial correlation, Point Bi serial Correlation, etc. Point bi-serial correlation, Tetra choric, Phi-Correlation Contingency coefficient C. & Partial and Multiple Correlation</p>	1								
4		<p>Testing of null hypothesis and non-parametric methods Testing of null hypothesis by chi-square test • Non parametric methods</p> <ul style="list-style-type: none"> • Meaning & scope • Candal's T-test • Candal's W-test • Mann-whitney U-test • Wilcoxon Testing • Use of parametric and non-parametric methods <p>Reliability: Meaning, Methods, Calculations of split half, length of test and reliability methods of rational equivalent. Validity: Meaning, Methods, Calculations, length of test of validity. • Scaling of test : T scaling & Stanine scores Scaling of Judgments and their types</p> <ul style="list-style-type: none"> • Item analysis: Difficulty index, Discrimination index • Item objective congruence (IOC) in CRT <p>Factor Analysis</p> <ul style="list-style-type: none"> • Meaning, scope, basic equations • Use of factor analysis • Types and Identification of factors • Different methods of F.A. • Use of statistical software in data analysis 	1								
Assessment & Evaluation	Credit	Internal	External	Total O/o 70							
			Sem. End Exam								
	Theory	Practical	Assignment		Project	Seminar	Test	Total	Theory	Practical	Total
	4	0	5	5	5	15	30	70	0	70	70



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed.

Semester-VI

Paper No: 1612130

Optional

Subject: Education

Credit: 4

: Title of the paper:

Education Statistics

REFERENCE BOOKS:

- 1 Blommers, Paul and Lindquist (1965). Elements Statistical Methods, University of London press Ltd.
- 2 Dowine N. M., R.W. Heath (1965). Basic Statistical Methods, New York: Harper & Row.
- 3 Edwards, A. L. (1963). Statistical Methods of Behavioural Science, New York: Hall, Rinherth and Winston.
- 4 Garrett, H. E. (1961). Statistics in Psychology and Education, Bombay: Allied Pacific Pvt. Ltd.
- 5 Guilford J.P. (1965). Fundamental Statistics in Psychology and Education, New York: McGraw Hill Co. Inch.
- 6 Lindquest, E. F. (1968). Statistical Analysis in Educational Research, Oxford and IBH Publication Co.
- 7 Patel R. S. (2011). Statistical Methods for Eudcational Research, (1st Ed.) Ahmedabad; Jay Publication
- 8 N.J. Castdlan (1988). Non Parametric Statistic, New York: McGraw Hill Book Company.



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-VI</p> <p style="text-align: center;">Paper No: 1612200</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 2</p> <p>: Title of the paper:</p> <p>Presentation of Teaching Learning Material</p>
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Objective of the course:

- To review teaching learning material.
- To understand teaching learning material.
- To presentation of teaching learning material.

Unit	Sub Unit	Content	Credit									
1		<p>Presentation of Teaching Learning Material</p> <p>Understanding Teaching Learning Material.</p> <p>Selecting appropriate Teaching Learning Material.</p> <p>Presentation of Teaching Learning Material.</p>	2									
Assessment & Evaluation		Credit	Total									
		Internal		External								
		Theory	Practical	Assignment	Project	Seminar	Test	Sem. End Exam		Total O/o 70		
		0	2	10	10	10	20	50	0		0	0

REFERENCE BOOKS:

- Becoming Better Teacher Microteaching Approach, Developed at the Centre of Advanced Study in Education, the M.S. University of Baroda, Baroda
- Practice Teaching: A Reflective Approach, Jack C. Richards, Thomas S. C. Farrell, Cambridge University Press, 14-Mar-2011 - Foreign Language Study
- Approaches and Methods in Language Teaching, Jack C. Richards, Theodore S. Rodgers, Cambridge University Press, 16-Apr-2014 - Foreign Language Study - 410 pages
- The Practice of Teaching, Philip Wesley Jackson, Teachers College Press, 1986 - Education - 159 pages
- A Guide to Teaching Practice: 5th Edition, By Louis Cohen, Lawrence Manion, Keith Morrison, Dominic Wyse
- Ernest stringer(1999)action research in education
- Jean,Mc niff, action research: principals and practice



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-VI</p> <p style="text-align: center;">Paper No: 1612300</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education Credit: 6</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Internship</p>
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Objective of the course:

- To understand educational system through personal experience.
- To develop the habit of observation and to relate it to knowledge.

Unit	Sub Unit	Content	Credit
1		Internship in Teacher education institutions	6

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	6	10	10	10	20	50	0	0	0	0

REFERENCE BOOKS:

- Becoming Better Teacher Microteaching Approach, Developed at the Centre of Advanced Study in Education, the M.S. University of Baroda, Baroda
- Practice Teaching: A Reflective Approach, Jack C. Richards, Thomas S. C. Farrell, Cambridge University Press, 14-Mar-2011 - Foreign Language Study
- Approaches and Methods in Language Teaching, Jack C. Richards, Theodore S. Rodgers, Cambridge University Press, 16-Apr-2014 - Foreign Language Study - 410 pages
- The Practice of Teaching, Philip Wesley Jackson, Teachers College Press, 1986 - Education - 159 pages
- A Guide to Teaching Practice: 5th Edition, By Louis Cohen, Lawrence Manion, Keith Morrison, Dominic Wyse
- Ernest stringer(1999)action research in education
- Jean,Mc niff, action research: principals and practice



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<p style="text-align: center;">M.Sc.,M.Ed.</p> <p style="text-align: center;">Semester-VI</p> <p style="text-align: center;">Paper No: 1612400</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Dissertation in Education</p>
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Objective of the course:

- To understand educational research through personal experience.
- To develop the habit of conducting research at smaller scale and to relate it to knowledge and wisdom.

Unit	Sub Unit	Content	Credit
1		<ul style="list-style-type: none"> Data collection and carrying out Designed research Summarizing and analyzing data Writing research report 	4
2			
3			
4			

Assessment & Evaluation	Credit		Internal					External			Total
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	0	4	0	0	0	0	0	0	150	150	150

REFERENCE BOOKS:

Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition, Jul 15, 2008, by John W. Creswell, SAGE Publications, Inc.

Research Methodology: Methods and Techniques Paperback – Abridged, by C R Kothari & Gaurav Garg , New Age Publication

Research Methodology Paperback – Abridged, Audiobook, by Panneerselvam R (Author) , PHI Publication

Research Methods Paperback – Import, 1 Jan 2001, by Ram Ahuja (Author) , Rawat Publication

Research Methodology Paperback – 2004, by Manoj Sharma (Author) , Anmol Publisher

Practical Approach to Research Methodology Paperback – 2005 by S. P. Verma (Author) , Akansha Publishing

Research Methodology: A Guide for Researchers in Management and Social Sciences Paperback – 2006, by Taylor, Sinha, Ghoshal, (Author), Prentice Hall India Learning Private Limited; 1st Edition edition (2006)

SPSS in Simple Steps Paperback – 2011, by Kiran Pandya (Author), Snruti Bulsari (Author), Sanjay Sinha (Author), Dreantech Press (2011)

Using SPSS In Research Paperback – 2016, by Dr. Radha Mohan (Author), Neelkamal Publications



Indian Institute of Teacher Education, Gujarat.

<p style="text-align: center;">M.Sc.,M.Ed. Semester-VI</p> <p style="text-align: center;">Paper No:2612304</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Mathematics Credit: 4</p> <p style="font-size: 1.2em;">: Title of the paper:</p> <p style="font-size: 1.2em;">Discrete Mathematics</p>
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- Objective of the course:**
- To Understand the concept of Lattice Theory & Boolean Algebra.
 - To Develop the skills of Calculation of Mathematical Logic, Lattice Theory & Boolean Algebra.
 - To acquire Knowledge of Discrete Mathematical Structure.
 - To Apply the knowledge of Discrete Mathematical Structure for any real-time problem.

Unit	Sub Unit	Content	Credit									
1		Automata Theory :Languages and Grammars, Finite State Machines, Semigroups, Machines and Languages, Moore Machines, Simplification of Machines, Moore Machines and Regular Languages, Kleene's Theorem, Pumping Lemma, Nondeterministic Finite State Automata.	1									
2		Lattice Theory: Lattices as partially ordered sets, Properties of Lattices, Lattices as algebraic systems, Sublattices. Meet and Join Extreme elements of Poset. Sub lattices, Direct product and Homomorphisms of lattices, Special types of lattices,.	1									
3		Boolean Algebra: Boolean expressions and their equivalence, Types of Boolean Algebra. Boolean functions and expression. Minterm and Maxterm-Sum of Product (SoP) , Product of Sum (PoS) of Boolean expression. Switching Network from Boolean expression using logic gates. Values of Boolean expression, canonical forms, Boolean functions, representation of Boolean function, Karnaugh maps, minimization of Boolean function, Quine_ McCluskey algorithm.	1									
4		Practical: Based on <ol style="list-style-type: none"> 1. Formulate the Mathematical Statement and predicate. 2. Verifying the properties of Logical connectives, Lattices, Meet, Join & Boolean algebra. 3. Verify the truthness of the statement through truth tables as well as properties. 4. Check the validity of the given argument. 5. Explain the De'moiver's law. 6. Represent the given relation through graph and matrix. 7. Construct hass diagram for the Poset. 8. Simplify the Boolean Expression-Using KarnaughMap, Logic gates & Quine-Macluskey's algorithm. 	1									
		Credit	Internal	External								
Assessment & Evaluation		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		Theory	Practical				Theory	Practical	Total			Total O/o 70
		3	1	5	5	5	15	30	70	30	100	70

- REFERENCE BOOKS:**
- 1) Grimaldi, R.P, Discrete and Combinatorial Mathematics, 3rd Edition, Addison-Wesley Publishing Company, 1994.
 - 2) Johnsonbaugh, R., Discrete Mathematics, Pearson Education, First Indian Reprint, 2001.
 - 3) Kolman, B, Busby, R.C., Ross, S.C., Discrete Mathematical Structures, 5th Edition, Pearson Education, 2006.



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<p style="text-align: center;">M.Sc., M.Ed. Semester-VI</p> <p style="text-align: center;">Paper No: 2612414</p> <p style="text-align: center;">Elective</p>	<p>Subject: Mathematics Credit: 4</p> <p style="font-size: 1.2em;">: Title of the paper:</p> <p style="font-size: 1.2em;">Mathematical Methods</p>
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Objective of the course:

- To Understand concept of special functions, Transform techniques.
- To Develop the skills of solving Bessel's equations and Legendre polynomials.
- To acquire Knowledge of various types of special functions, transformation techniques, etc.
- To Apply the knowledge of Mathematical Methods to any real-time problem.

Unit	Sub Unit	Content	Credit
1		Special Function: Beta –Gamma functions, its properties & inter relations, applications to improper integral.	1
2		General solution of Bessel equation, Recurrence relations, Orthogonal sets of Bessel functions, Modified Bessel functions, Applications. General solution of Legendre equation, Legendre polynomials, Associated Legendre polynomials, Rodrigues formula, Orthogonality of Legendre polynomials, Application.	1
3		Fourier Series, Generalized Fourier series, Fourier Cosine series, Fourier Sine series, Fourier integrals.	1
4		Fourier transform, Laplace transform, Z-transform, Hankel transform, Mellin transform. Solution of differential equation by Laplace and Fourier transform methods.	1

Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	70

REFERENCE BOOKS:

1. G. N. Watson, A Treatise on the Theory of Bessel Functions, Cambridge University Press, 1944.
2. G. F. Roach, Green's Functions, Cambridge University Press, 1995.
3. A. D. Poularikas, The Transforms and Applications Handbook, CRC Press, 1996.
4. I Sneddon, The use of Integral Transforms, Tata Macgraw Hill - 1979.



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<p style="text-align: center;">M.Sc.,M.Ed. Semester-VI Paper No:2612424</p> <p style="text-align: center;">Elective</p>	<p>Subject: Mathematics Credit:4</p> <p>: Title of the paper:</p> <p>Partial Differential Equation</p>
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- Objective of the course:**
1. To Understand the concept of Partial Differential Equations.
 2. To Develop the skills of obtaining solutions of Various Partial Differential Equations.
 3. To acquire Knowledge of Various Partial Differential Equations.
 4. To Apply the knowledge of Various Partial Differential Equations for any real-time problem

Unit	Sub Unit	Content	Credit									
1		First order PDE Surfaces and curves in three dimensions, simultaneous differential equations of the first order and the first degree in three variables, methods of solutions of $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$, orthogonal trajectories of a system of curves on a surface.	1									
2		Origins of first order partial differential equations, linear equations of the first order, integral surfaces passing through a given curve, Cauchy problem of the first order, surfaces orthogonal in a given system of surfaces.	1									
3		Non – linear partial differential equations of the first order, Charpit’s method, special types of first order equations, solution satisfying given conditions, Jacobi’s method, applications of first order equations, miscellaneous problems.	1									
4		Higher order PDE: Complementary function and Auxiliary equation for homogeneous PDE. Methods to solve Homogeneous PDE, Non homogeneous PDE for higher order. Pffafian differential forms and equations, solutions of Pffafian differential equations in three variables, miscellaneous problems.	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		3	1	5	5	5	15	30	70	30	100	70

- REFERENCE BOOKS:**
- (1) “**Elements of Partial Differential Equations**” by I. Sneddon, Mc Graw Hill.
 - (2) Partial Differential Equations by F. John, Narosa Publishing House, New Delhi, 1979.
 - (3) Elementary Course in Partial Differential Equations by Amarnath, Narosa Publishing House, New Delhi, 1997.
 - (4) **Partial Differential Equations**- Lawrence C. Evans, American Mathematical Soc., 2010
 - (5) **An Introduction to Partial Differential Equations**, Michael Renardy, Robert C. Rogers, Springer