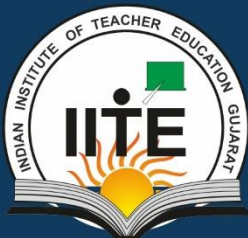


M.Sc., M.Ed. (Botany) Syllabus



॥ 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

1.0 Programme, Duration and its equivalence:

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

1.1.1 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.

1.1.2 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.

1.2 Equivalence:

1.2.1 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.

1.2.2 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.

1.2.3 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.

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

2.1 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.

1. B.A., B.Ed. from IITE, or
2. 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.

1. B.Sc., B.Ed. from IITE, or
2. Graduate in any of the subjects of Science Faculty and B.Ed.

2.3 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.

3.0 Scheme of Instruction:

There will be six semesters and students will have to learn following subjects in two broad areas of curriculum in Education.

1. PG Course in respective academic programme, and
2. PG Course in Teacher Education

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

3.1 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:

- i. English (M.A.),
- ii. Botany (M.Sc.),
- iii. Chemistry (M.Sc.),
- iv. Maths (M.Sc.), and
- v. Physics (M.Sc.)

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

- 3.1.1 Core Compulsory: There are 16 Core Compulsory Courses in each.
- 3.1.2 Core Optional: There are 8 Core Optional Courses in each and student has to opt any of the 4 courses.
- 3.1.3 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 Evalua- tion			Total	GP	Letter Grade	GPA
		menl/Practical - Assi gn	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	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21002	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21003	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21004	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21005	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
21031	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
22006	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22007	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22008	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22009	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22010	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
22032	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
23011	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
23012	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
23113	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
23213	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
23033	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
24014	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
24015	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
24116	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
24216	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
24034	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	IR	Innovation in Research	4
25017	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
25118	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
25218	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
26019	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CC	Core Compulsory	4
26120	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	4
26220	21001BIO	21001C HE	21001MAT	21001PHY	21001ENG	CO	Core Optional	
Total Credits								96

Annexure 2.2 M.Sc. (Botany), M.Ed.

Sr. No	Semester	Paper No.	Theory/ Theory & Practical/ Tutorial	Title of Paper/course	Credit	To be Included as core/ Elective	Marks for Evaluation	
							Internal	External
1	I	2110101	Theory & Practical	Biological Chemistry	4	Core	30	70
2		2110201	Theory & Practical	Principals Of Microbiology	4	Core	30	70
3		2110301	Theory & Practical	Principals Of Plant Sciences	4	Core	30	70
4		2110401	Theory & Practical	Plant Anatomy	4	Core	30	70
5		2110501	Theory & Practical	Concepts Of Ecology	4	Core	30	70
6		2110601	Theory	Foundation Course On Research In Botany-1	2	Core	30	70
7	II	2210701	Theory & Practical	Molecular Cell Biology	4	Core	30	70
8		2210801	Theory & Practical	Genetics And Evolution	4	Core	30	70
9		2210901	Theory & Practical	Molecular Biology	4	Core	30	70
10		2211001	Theory & Practical	Developmental Biology	4	Core	30	70
11		2211101	Theory & Practical	Biostatistics And Bioinformatics	4	Core	30	70
12		2211201	Theory	Foundation Course on Research in Botany-2	2	Core	30	70
13	III	2311301	Theory & Practical	Applied Plant Sciences	4	Core	30	70
14		2311401	Theory & Practical	Plant Physiology	4	Core	30	70
15		2311511	Theory & Practical	Forestry	4	Elective	30	70
16		2311521	Theory & Practical	Marine Botany	4	Elective	30	70
17		2311601	Theory	Foundation Course On Research In Botany-3	2	Core	30	70
18	IV	2411701	Theory & Practical	Analytical-Separation Technique and Bioinstrumentation	4	Core	30	70
19		2411801	Theory & Practical	Pteridophyte and Gymnosperm	4	Core	30	70
20		2411911	Theory & Practical	Plant diversity and Human welfare	4	Elective	30	70
21		2411921	Theory & Practical	Soil and Plant Nutrition	4	Elective	30	70
22		2412001	Theory	Foundation Course On Research In Botany-4	2	Core	30	70
23	V	2512101	Theory & Practical	Plant Biotechnology	4	Core	30	70
24		2512211	Theory & Tutorial	Horticulture	4	Elective	30	70
25		2512221	Theory & Practical	Medicinal Botany	4	Elective	30	70
26	VI	2612301	Theory & Practical	Phyto Resources-Utilization and Management	4	Core	30	70
27		2612411	Theory & Practical	Environment Sciences	4	Elective	30	70
28		2612421	Theory & Practical	Plant Organism Interaction	4	Elective	30	70



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: 1110100</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;">Methods of Research in Education-1</p>
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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 1.1 1.2 1.3 1.4 1.5	<ul style="list-style-type: none"> • CONCEPT OF EDUCATIONAL RESEARCH • Meaning, characteristics Education Research, Steps of the research process • Types of research: (a) Basic, Applied and Action research (b) Qualitative and Quantitative research • Areas of educational research • Types of sources • Library skill? Reading skill and note taking skill 	1									
2	2.0 2.1 2.2 2.3 2.4 2.5	<ul style="list-style-type: none"> • SELECTION OF THE RESEARCH PROBLEM AND CONCEPT OF VARIABLES AND HYPOTHESES • Criteria for selection of research problem and sources • Defining operationally the related terms of research problem • Meaning and Types of variables • Meaning and Types of hypothesis • Bases for hypothesis construction 	1									
3	3.0 3.1 3.2 3.3 3.4 3.5 3.6	<ul style="list-style-type: none"> • TOOLS OF RESEARCH • Psychological Test: (a) types and its uses (b) construction procedure • Questionnaire: (a) types, format and guidelines for questions and questioner? (b) advantages and disadvantages • Interview:(a) types of interview such as individual and group, structured & unstructured (b) Administration of interview • Rating Scales: types, format and guidelines for constructing Rating Scales • Measurement of Attitude: Thurston and likert technique us meaning of checklist, Q-sort and semantic differential • Standardization of research tools: Reliability, Validity and Norms 	1									
4		<ul style="list-style-type: none"> • Sampling Techniques • Meaning of population and sample • Importance of sampling • Characteristics of a good sample • 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. 	1									
Assessment & Evaluation		Credit	Internal					External			Total	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		Theory	Practical				Total					
		4	0	5	5	5	15	30	70	0	70	70



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		Yoga-It's Philosophy <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		Astang yoga: First four limbs <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-possessive ness). • 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 Asthtang yoga. 	0.5									
4		<ul style="list-style-type: none"> • YOG PRACTICIES (PRACTICAL) • Pranayams: Bhastrika, anulom-vilom, kapalbhati, bahya, agnisar, bramri, udgit, ujjai shitli, sitkari, na disodhan, karnrogantak, surya bhedi, chandra bhedi etc.) • Asanas; • Standing postures: garudasan, trikonasan, dhruvasan, natrajasan. • Sitting postures: yogmudrasan, baudhpadmasan, va krasan, ardhmasendrasan, vajrasan, kukutasan, sidhasan, kapotasan, marjarasan • Prone Posture: naukasan (viprit), bhekasana, dhanurasan, salbhasan, bhujangasan • Seepine posture: Naukasan, sarvangasan, halasan, matsyasan, vipritkarni Suryanamaskar • Relaxation exercises and savasana is compulsory between and end of session. 	0.5									
Assessment & Evaluation		Credit	Internal					External			Total	
									Sem. End Exam			
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical		Total
0	2	5	5	5	15	30	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
 Rajrshimuni : Yoga Darshika
 Maharshi Arvind : soul development through yoga, www.pathofdivinelife.org
 Yoga – Its philosophy & Practice - Swami Ramdev
 Yoga dipika - Dr. A.K. Ayaner



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<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:2110101</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany</p>	<p style="text-align: right;">Credit:4</p>
<p style="font-size: 1.2em;">: Title of the paper:</p> <p style="font-weight: bold; font-size: 1.1em;">BIOLOGICAL CHEMISTRY</p>		

Objective of the course:

- Students will be able to understand the basics of biochemistry.
- Fundamentals of biomolecules will be methodically elucidated to the students with the practical incorporating to the theory which will improve their experimental skills in biochemistry.

Unit	Sub Unit	Content	Credit									
1		Carbohydrate <ul style="list-style-type: none"> • Classification • Nomenclature • Structure and properties of carbohydrates • Regulation of Carbohydrate metabolism 	1									
2		Proteins and Nucleic acid <ul style="list-style-type: none"> • Structures, physical properties and functions of amino acids. • Isoelectric points of amino acids. • Three dimensional structure of protein: Primary, Secondary, Tertiary and Quaternary configuration, Protein denaturation • Synthesis and its regulation of Purines and Pyrimidines • Degradation of nucleotides. • Structure and biosynthesis of different types of RNA. • Structure and polymorphism of DNA. 	1									
3		Lipids <ul style="list-style-type: none"> • Structure and functions of Lipids –Phospholipids. • Glycoconjugates - Glycolipids and glycoprotein and their role in biological processes. • Structure and functions of Steroid, cholesterol metabolism 	1									
4		Practicals <ul style="list-style-type: none"> • Detection of carbohydrates • Monosaccharide - Glucose • Disaccharide – lactose • Disaccharide - Sucrose • Detection of Proteins • Albumin • Casein • Calorimetric estimation of Protein • Preparation of standard curve by Biuret method • Calorimetric estimation of Glucose • Nelson Somogy method • Atomic Models of Carbohydrates and Protein • Ribose • Sucrose • Amino acid (Except heterocyclic amino acids) 	1									
Assessment & Evaluation		Credit	Internal					External			Total	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		3	1	5	5	5	15	30	70	30		100

REFERENCE BOOKS:

Elementary Biochemistry, J. L. Jain. S. Chand & Company, Delhi
 Biochemistry, I. Stryer, Freeman;
 Harpers Biochemistry, Lange, Mc Graw- Hill.
 Principles of Biochemistry, Lehninger, CBS Publications.



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed. Semester-I Paper No: 2110201 Compulsory	Subject: Botany	Credit: 4
: Title of the paper: PRINCIPLES OF MICROBIOLOGY		

Objective of the course:

- Students will be able to acquire, articulate, retain and apply scientific language and knowledge relevant to microbiology.
- They will also be able to describe/explain the processes used by microorganisms for their replication, survival, and interaction with their environment, hosts, and host populations.

Unit	Sub Unit	Content	Credit									
1		Bacteria <ul style="list-style-type: none"> • General account, Archae and Eubacteria. • Classification of micro-organisms, microbial morphology (shapes). • Basic methods in microbiology, economic importance 	1									
2		Virus <ul style="list-style-type: none"> • Virus, characteristics, virions. • Bacteriophages, lytic and lysogenic, economic importance. • Phytoplasma, characteristics, plant diseases 	1									
3		Plant Pathology <ul style="list-style-type: none"> • Disease, Classification, Symptoms and Disease triangle. Disease Cycle, Host Parasite relationship • Disease Control, Role of Weather and Soil fertility on disease development. • Important diseases - Powdery mildew, Downy mildew, Rusts and Wilts. 	1									
4		Practical <ul style="list-style-type: none"> • Practical Based on Unit I, II and III 	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		3	1	5	5	5	15	30	Theory	Practical		Total
		70	30	100			70					

REFERENCE BOOKS:

- Agrios, G. N. 1988. Plant Pathology. Academic Press.
- Alexopoulos, C.J., Mims, C.W. and Blackwell, M. 1996. Introductory Mycology. John Wiley and Sons Inc.
- Foster, A.S. and Gifford, E.M. 1967. Comparative Morphology of Vascular Plants. Vakils Feffer and Simons Pvt. Ltd. Bombay.
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- Kumar, H.D. 1988. Introductory Phycology. Affiliated East - West Press Ltd., New Delhi.
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- Rangaswamy, G. and Mahadevan, A. 1999. Diseases of Crop Plants in India. (4th Ed.). Prentice Hall of India Pvt. Ltd., New Delhi.
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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-I</p> <p style="text-align: center;">Paper No: 2110301</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Botany Credit: 4</p> <p>: Title of the paper:</p> <p>PRINCIPLES OF PLANT SCIENCES</p>
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Objective of the course:

- Students will be able to understand the morphology, structure and functions of various parts of plants and will learn the taxonomical terminology and understand the meaning of the same.
- They will be enable to understand the nomenclature of plants as well as to identify the plants of selected families on the basis of its taxonomical characters.

Unit	Sub Unit	Content	Credit								
1		<p>Botanical Nomenclature and Classification</p> <ul style="list-style-type: none"> • Taxonomy and systematic botany, aim, concepts of plant classification. • Botanical nomenclature, International Code of Botanical Nomenclature, salient features, species concept • Systems of classification (Natural, artificial, phylogenetic) and their merits/ demerits • Taxonomic evidences (anatomy and embryology) 	1								
2		<p>Morphology</p> <ul style="list-style-type: none"> • Vegetative plant parts (root/ stem/ leaves) and their modifications • Reproductive plant parts (Inflorescence/ flower/ fruit/ seed) and their modifications • Plant forms, origin and general evolutionary trends in flowering plants. 	1								
3		<p>Plant Families</p> <ul style="list-style-type: none"> • Plant identification and use of keys, taxonomic literature • Plant families –Dicot (10) characteristics with representative examples and economic importance • Plant families –Monocot (05) features with examples and economic importance. 	1								
4		<p>Practical</p> <ul style="list-style-type: none"> • Practical Based on Unit I, II and III 	1								
Assessment & Evaluation	Credit		Internal					External			Total
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	

REFERENCE BOOKS:

- RAGHAVAN, V. 1999. DEVELOPMENTAL BIOLOGY OF FLOWERING PLANTS. SPRINGER - VERLAG, NEW YORK.
- NAIK, V.N. 1984. TAXONOMY OF ANGIOSPERMS. TATA MCGRAW - HILL PUBLISHING CO. LTD. NEW DELHI.
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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-I</p> <p style="text-align: center;">Paper No: 2110401</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Plant Anatomy</p>
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Objective:

- Student will learn anatomical structure and function of various tissues. They will also understand the mechanism of growth in plants and the role of different tissues in the same.
- During lab hours, students will experience the benefits of team work which will foster their flexibility and responsiveness, especially the ability to respond to change.

Unit	Sub Unit	Content	Credit								
1		Tissue System <ul style="list-style-type: none"> Meristematic Tissue: Characteristics, Classification, Theories and Functions Epidermal Tissue system: Epidermis, Stomata, Epidermal Appendages Ground Tissue System: Cortex, Endodermis, Pericycle, Pith Vascular Tissue System: Procambium, Vascular Bundles, Formation and Types 	1								
2		Anatomy of Root, Stem and Leaf <ul style="list-style-type: none"> Structure of Dicot and Monocot Root: Primary and Secondary Growth Structure of Dicot and Monocot Stem: Primary and Secondary Growth Structure of Dicot and Monocot Leaf Nodal Anatomy: Leaf traces and leaf gaps 	1								
3		Anatomical techniques <ul style="list-style-type: none"> Microscopy: Principle and Working of Simple and Compound Light Microscopes Micro techniques – Simple Staining, Double Staining for Preparation of Permanent Slides 	1								
4	Practical	Micro preparation of the following: <ul style="list-style-type: none"> a. Primary Structure of Stem, Root and Leaf of Dicot and Monocot Plants. b. Normal Secondary Thickening in Dicot Stem and Root. c. Anomalous Secondary Growth in Boerhaavia and Dracaena. Identify the following: <ul style="list-style-type: none"> a. Slide Showing Meristems – Shoot and Root Apex. b. Slide Showing Xylem Elements. 	1								
Assessment & Evaluation	Credit		Internal					External			Total
								Sem. End Exam			
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Theory	Practical	Total	
	3	1	5	5	5	15	30	70	30	100	

REFERENCE BOOKS:

- CUTTER, E.G. 1969. PLANT ANATOMY PART-I, CELLS AND TISSUES, EDWARD ARNOLD, LONDON.
- CUTTER, E.G. 1971. PLANT ANATOMY: EXPERIMENT AND INTERPRETATION. PART-II ORGANS, EDWARD ARNOLD LONDON. ESAU, K. 1977. ANATOMY OF SEED PLANTS, 2ND EDITION. JOHN WILEY & SONS, NEW YORK.
- FAHN, A. 1974. PLANT ANATOMY, 2ND EDITION. PERGAMON PRESS, OXFORD
- PLANT ANATOMY, CHANDURKAR P J, PLANT ANATOMY OXFORD AND IBH PUBLICATION CO. NEW DELHI 1971 2. B P PANDEY
- PLANT ANATOMY, S CHAND AND CO. LTD, NEW DELHI 1978



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<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: 2110501</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit:4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">CONCEPTS OF ECOLOGY</p>
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Objective:

- Students will become familiar with the variety of ways that organisms interact with both the physical and the biological environment. They will develop an understanding of the differences in the structure and function of different types of ecosystems.
- They will develop an appreciation of the natural world through direct experience with local ecosystems and learn techniques of data analysis as well as methods of presenting scientific information in figures and tables. They will also learn techniques for gathering data in the field.

Unit	Sub Unit	Content	Credit									
1		Basics of Ecology <ul style="list-style-type: none"> Ecological Factors: Soil, light, water etc, Principles of limiting factors; biotic factors, Productivity: Population ecology – concept, types, fluctuation, factors regulating size, mortality – natality Population ecology, concept, type, fluctuations, factors regulating size, autecology, mortality, natality. Ecosystem Organization: Structure and Function, Types, Energy Flow in Ecosystem, Biogeochemical cycles (C, N, P and S). 	1									
2		Community and Biodiversity <ul style="list-style-type: none"> Vegetation Organization: Composition and Structure of Plant Community, Qualitative and Quantitative Characteristics, Phytosociological Methods, Ecological Niche. Vegetation Development: Process of Ecological Succession, Models and Climax Stage, Hydrosere, Xerosere and causes of succession, productivity - concept. Biological Diversity: Concepts and levels; role of biodiversity in ecosystem functions and stability; speciation and extinction; IUCN categories of threat; biodiversity hot spots; ecology of plant invasion; 	1									
3		Environmental Issues <ul style="list-style-type: none"> Environmental Pollution: Air, Land and Water. Pollution, kinds; sources; quality parameters; Ecological Adaptations, various adaptations, types, sustainable development, EIA Climate Change: Greenhouse gases (CO₂, CH₄, N₂O, CFCs; sources, trends and role); ozone layer and ozone hole, consequences of climate change (CO₂ fertilization, global warming, sea level rise, UV radiation). 	1									
4	Practical	<ul style="list-style-type: none"> Minimum Size of Quadrats Minimum Number of Quadrats Study of community by Quadrats Line Quadrate Belt Quadrate Chart Quadrate Demonstration practical based on above units 	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



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed.

Semester-I

Paper No: 2110501

Compulsory

Subject: Botany

Credit:4

: Title of the paper:

CONCEPTS OF ECOLOGY

REFERENCE BOOKS:

Basic Ecology – Eugene P. Odum

Fundamentals of Ecology- P. Odum

Concept in Indian Ecology and Environmental Science – S. V. S. Rana

Ecology Theories and Application – Peter Stiling

Ecology & Environment – P. D. Sharma

Indian Manual of Plant Ecology – R. Misra & G. S. Puri

Responses of Plants to environmental stresses, Levitt, J. (1980) Academic Press.

Ecology, N.S. Subrahmanyam & A.V.S.S. Sambamurthy, Narosa Publishing House



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.M.Ed. Semester-I Paper No: 2110601 Compulsory</p>	<p>Subject: Botany Credit: 2</p> <p>: Title of the paper: Foundation course on research in Botany -1</p>
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Objective:

- Students will learn about different aspects of research and will be able to write research paper and reports in proper scientific manner

Unit	Sub Unit	Content	Credit								
1		INTRODUCTION TO RESEARCH: <ul style="list-style-type: none"> • Significance of research, Research methods versus methodology, Research and Scientific methods, Defining the research Problem and Research design. 	1								
2		INTRODUCTION TO METHODOLOGY: <ul style="list-style-type: none"> • Format of thesis and dissertation, Research article and presentation, Reviews, Monographs, References, Bibliography, Literature search, 	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	00	70	
							70			70	

REFERENCE BOOKS:

- Kothari, C.R; II ed. (2006), Research Methodology, Methods and techniques; New Age International (p) Ltd., New Delhi.
- Kumar K. L.' (1997), Educational Technology, New Age International (P) Ltd., New Delhi.
- Donald R. Cooper, Pamela S. etc., Business Research Methods, 8th Edition, Tata McGraw Hill Co.Ltd.2006
- Tony Bates A.W. Technology, (2005), e-Learning and Distance Education, New York



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-II</p> <p>Paper No: 1210300</p> <p>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 Foundation of Education – 1</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		<ul style="list-style-type: none"> • Educational psychology & cognitive Development Educational Psychology: Definition of Psychology Concept, Nature and scope of Educational Psychology Psychology of Instruction: Meaning and its Nature • Growth and Development Definition, Meaning & Characteristics of Growth & Development Principles of Development Factors Influencing Development • Stages of Development Characteristics of each stage Problems of Adolescence Period • Piaget's Theory of Cognitive Development Terminologies: Schema, Cognitive Structure, Reflexes, Organization, Assimilation, Accommodation Stages of Cognitive Development Educational Implications of Cognitive Development 	1
2		<ul style="list-style-type: none"> • Learning and Motivation Definition and Characteristics of Learning Gagne's Hierarchy of Learning: Types and Conditions • Learning Curve 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 • Motivation Meaning and factors affecting motivation Role of motivation in learning Maslow's self-actualization theory • Transfer of Learning Theories of transfer of learning Educational implication 	1
3		<ul style="list-style-type: none"> • Learning Theory of Thorndike (Trial & Error) Puzzle Box Experiment Laws of Learning and its educational implications • Pavlov's Classical Conditioning Theory of Learning: Experiment, Process Findings and Educational Implications • Bandura's Theory of Social Learning Meaning and Essentials of Social Learning Bobo Doll Experiment Social Learning Process Educational Implications • Bruner's Theory of Discovery Learning Meaning and types of Concept Meaning of Discovery Learning Steps and educational implication 	1

4	<ul style="list-style-type: none"> • Hull's Drive Reduction Theory of learning Four Level Learning Theory Postulates for Learning Educational Implications • Tolman's Sign Gestalt Theory of learning Meaning of Sign – Gestalt Theory Types of learning Laws of Learning Educational Implications • Information Processing Levels of information Model of Information processing Educational Implications • Constructivism Concept & Characteristics Role of teacher in constructivist learning Educational Implications 	1									
Assessment & Evaluation	Credit	Internal					External				
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Total O/o 70
								Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	

REFERENCE BOOKS:

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

ભટ્ટ કુસુમબેન કે.(૧૯૯૬)વ્યાક્રત્વના સિદ્ધાંતો.અમદાવાદ:યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
 દેસાઈ કે. જી., સી. ટી., ભીપત્કાર અને જી. અચૂ શાહ (૧૯૮૧) મનોવિજ્ઞાનક પારિભાષા અને
 વિભાવના.અમદાવાદ:યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
 દોગા નનુભાઈ (૧૯૯૫)અધ્યાપન મનોવિજ્ઞાન.રાજકોટ: નિજીજન સાયકો સેન્ટર
 દોગા નનુભાઈ, (૨૦૦૭)અધ્યયનનું મનોવિજ્ઞાન.રાજકોટ: નિજીજન સાયકો સેન્ટર.
 શાહ ગણિવત(૧૯૭૮)અધ્યયનનીમિમાસા.રાજકોટ: નિજીજન સાયકો સેન્ટર
 શક્ત સેતીશપ્રકાશ,(૨૦૧૨) અધ્યેતા સ્વરૂપ અને વિકાસ.આગરા અગ્રવાલ પ્રકાશન.

- Pathak, P. D. (2009) ix9a mnoiv)an. Agra : Agrawal Publications.
- Pathak, P. D. (2008) indeRxn Ov. pramxR. Agra : Vinod Pustak Mandir.
- Sharma, Rakesh & Manisha, Joshi (2011) Ai2gmktaR ka ivkas Ov. ix9' Ai2gm p/içya. Agra : Agrawal Publications.



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
0	2	5	5	5	15	30	0	70	70	70		

REFERENCE BOOKS:

Anderson, Kenneth and Joan Madean. 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: 2210701</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">MOLECULAR CELL BIOLOGY</p>
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Objective :

- Students will be able to learn the cell biology from the ground level to the molecular level.
- Advanced techniques in practicals will make them skilled in the field of molecular biology.

Unit	Sub Unit	Content	Credit										
1		Evolution of the Cell: <ul style="list-style-type: none"> • Cell as a unit of living organisms. • Diversity of cell size and shapes • Structure of Prokaryotic and Eukaryotic cells • Single cell to multicellular organism • Cell - Cell interactions; Cell adhesions, and cell junctions • Molecular Basis of the Cell and Macromolecular recognition process 	1										
2		Cell Organelles I: <ul style="list-style-type: none"> • Molecular organization of Mitochondria, Q- cycle, Mechanism of Oxidative Phosphorylation, uncouplers and inhibitors; • Molecular organization of Chloroplast, Photosynthetic pigments, Photosystem I & II • Ultrastructure and Functions of Nucleus 	1										
3		Cell Organelles II: <ul style="list-style-type: none"> • Molecular Organization and functions of: <ul style="list-style-type: none"> • Endoplasmic reticulum • Golgi complex • Lysosomes and disease • Microbodies: Peroxisomes, Oxisomes and Glyoxisomes • Ribosomes 	1										
4		<ul style="list-style-type: none"> • Practical Based on Unit – I, II and III 	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

REFERENCE BOOKS:

- Cell and Molecular Biology De Robertis, E.D.P. and De Robertis E M F
- Cell and Molecular Biology Garald Karp J. Wiley & Sons, NY 2008
- Cell Biology – Structure and Function David E. Sadawa, Jones and Bartlett Pub., IND. 1993
- Cell Biology LabFax G.B. Dealtry & D. Rickwood Bios Scientific Pub. 1992
- Cell Biology, Genetics, Molecular Biology, Evolution and Ecology P.S. Verma, V.K. Agarwal S. Chand Pub., N Delhi 2004
- Cell Growth and Division, A Practical Approach. R. Basega, IRL Press, Oxford Univ. Latest
- Cell in Development and inheritance EB Wilson MacMilan, NY Latest



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-II</p> <p>Paper No: 2210801</p> <p>Compulsory</p>	<p>Subject: Botany Credit: 4</p> <p>: Title of the paper:</p> <p>GENETICS AND EVOLUTION</p>
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Objective of the course:

- Students will review the genetic basis of heredity for both Mendelian and quantitative characters. They will be able to explain classical transmission genetics and discuss this in the context of genes
- They will learn to use laboratory and computer skills in studying genetic and molecular biological processes

Unit	Sub Unit	Content	Credit									
1		Mendelian Genetics <ul style="list-style-type: none"> • Genetics – principles of inheritance, pea as a model hybrids • Gene interactions, linkage and crossing over, genetic mapping • Extra chromosomal inheritance, chloroplast, Mitochondria, genome and genes. 	1									
2		Mutation <ul style="list-style-type: none"> • Chromosome aberrations, ploidy, variation in structure and arrangement. • Mutation, physical – chemical, molecular basis, recombination, Transposons. • Damage and repair, site directed mutagenesis, sex linked inheritance 	1									
3		Molecular Genetics <ul style="list-style-type: none"> • Molecular basis of genetics, experiments, DNA, characteristics, structure and replication • Genetic expression, transcription, code, translation, modification • Gene regulation, prokaryotic, operon, eukaryotic 	1									
4	Practical	Practical <ul style="list-style-type: none"> • Practical Based on Unit I, II and III 	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	70	70		

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- Howell, S.H.1998. Molecular Genetics of Plant Development. Cambridge University Press, Cambridge.
- Murphy, T.M. and Thompson, W.F. 1988. Molecular Plant Development. Prentice Hall, New Jersey.
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- Atherly, A.G., Girton, J.R. and McDonald, J.F. 1999. The Science of Genetics. Saunders College Publishing, Fort Worth, USA.
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- Stent, G.S. 1986. Molecular Genetics. CBS Publication.
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- Chrispeels, M.J. and Sadava, D.E. 1994. Plants, Genes and Agriculture. Jones & Bartlett Publishers, Boston, USA.
- Collin, H.A. and Edwards, S. 1998. Plant Cell Culture. Bios Scientific Publishers, Oxford, UK.
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Indian Institute of Teacher Education, Gujarat.

<p>M.Sc., M.Ed.</p> <p>Semester-II</p> <p>Paper No: 2210901</p> <p>Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">MOLECULAR BIOLOGY</p>
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Objective:

- Students will be able to describe the function and structure of nucleic acid including the metabolic reactions that occur in cells.
- They will be able to explain the process of inheritance, replication and change.
- Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology

Unit	Sub Unit	Content	Credit								
1		Nucleic acids: <ul style="list-style-type: none"> • Physical and chemical properties of nucleic acids • Polymorphism in DNA • Isolation, purification and analysis of Nucleic acids • PCR • Rapid DNA sequencing techniques and strategies • Blotting techniques 	1								
2		Replication <ul style="list-style-type: none"> • Replication of DNA in eukaryotes • Enzymes and events in DNA replication • DNA Damage and Repair Mechanisms • Site directed mutagenesis • PCR mediated mutations • Applications of RAPDs and DNA finger printing 	1								
3		Cloning techniques and Proteomics <ul style="list-style-type: none"> • Basics of Proteomics, • Isolation and purification of Proteins • Recombinant Techniques, Cloning vector • Protein Folding and basics of protein engineering 	1								
4		<ul style="list-style-type: none"> • Practical • Practical Based on Unit I, II and III 	1								
Assessment & Evaluation	Credit		Internal					External			Total O/o 50
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
	3	1	5	5	5	15	30	Theory	Practical	Total	
								70	30	100	

REFERENCE BOOKS:

- Molecular Biology and Gene Cloning Volumes I and II T.A. Brown, Academic Press 2000.
- Genomes T.A. Brown Academic press. Latest Edition. Culture of Animal Cells. Ian Freshney. 2003
- Molecular Biotechnology. S.B. Primrose. Blackwell Scientific Publishers Oxford University Press. 2004
- Genes VII. Benjamin Lewin Oxford University Press.



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc., M.Ed.</p> <p>Semester-II</p> <p>Paper No: 2211001</p> <p>Compulsory</p>	<p>Subject: Botany Credit: 4</p> <p>: Title of the paper:</p> <p>DEVELOPMENTAL BIOLOGY</p>
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Objective:

- Students will be able to differentiate between various groups of Algae, Fungi and Bryophytes practically identify the various groups of plant kingdom.
- They will be able to correlate the evolution process on the basis of the structural difference between different organisms.

Unit	Sub Unit	Content	Credit									
1		Algae <ul style="list-style-type: none"> • Detailed study of the classification by F. E. Fritsch and G. M. Smith. • Salient features and Comparative study of Chlorophyta, Xanthophyta, Phaeophyta and Rhodophyta. [Major patterns of life cycle and post fertilization stages] 	1									
2		Fungi <ul style="list-style-type: none"> • Principles of classification of fungi, Classifications by G. C. Ainsworth (1973) and C. J. Alexopoulos. • Salient features and Comparative study of Myxomycota, Zygomycotina, Ascomycotina, Basidiomycotina 	1									
3		Bryophyta <ul style="list-style-type: none"> • Comparative structural organization of gametophytes and sporophytes in an evolutionary perspective. Asexual and sexual reproductive structures, spore dispersal mechanisms and germination of the following groups with reference to the types mentioned in the practical (development of sex organs not necessary). • Salient features and Comparative study of Hepaticopsida, Anthocerotopsida, Bryopsida 	1									
4		Practical <ul style="list-style-type: none"> • Practical based on Unit 1,2, &3. 	1									
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		
		3	1	5	5	5	15	30	70	30	100	70



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed.

Semester-II

Paper No: 2211001

Compulsory

Subject: Botany

Credit: 4

: Title of the paper:

DEVELOPMENTAL BIOLOGY

REFERENCE BOOKS:

- Chapman V J (1962). The Algae. Macmillan & Co. Ltd.
- Gilbert M Smith (1971). Cryptogamic Botany (Vol. 1): Algae and Fungi. Tata McGraw Hill Edition.
- F E Fritsch (Vol. I, II) (1977). The structure and reproduction of Algae. Cambridge University Press.
- Gilbert M Smith (1951). Manual of Phycology.
- Harnold C Bold, Michael J Wynne (1978). Introduction to Algae: Structure and reproduction. Prentice Hall
- C J Alexopoulos, M Blackwell, C W Mims. Introductory Mycology (IV Edn).
- L N Nair (2010). Methods of microbial and plant biotechnology. New Central Book agency (P) Ltd.
- Kanika Sharma. Manual of microbiology: Tools and techniques.
- G C Ainsworth, K F Sparrow, A S Sussman. The fungi: An advanced treatise.
- H C Dube (1983). An introduction to fungi. Vikas Publ. New Delhi
- Chopra R N, P K Kumar (1988). Biology of Bryophytes. Wiley Eastern Ltd.
- Chopra R S, S S Kumar (1981). Mosses of Western Himalayas and adjacent plains. Chronica
- Kumar S S (1984). An approach towards phylogenetic classification of Mosses. Jour. Hattori Bot. Lab. Nichinan, Japan.
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- Richardson D H S (1981). Biology of Mosses. Blackwell Scientific publications, Oxford.
- Sheffield W B (1983 – '84). Introduction to Bryology (Vol. 1, 2). Jour. Hattori Bot. Lab, Nichinan, Japan.
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- Arnold C R (1977). Introduction to Palaeobotany. McGraw Hill Book Com.
- Chandra S, Srivastava M (Eds) (2003). Pteridology in the New Millennium. Khuwar Acad. Publishers.
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- Smith, Gilbert (1972). Cryptogamic Botany (Vol. II). Tata McGraw Hill publications



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: 2211101</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Botany Credit: 4</p> <p>: Title of the paper:</p> <p>BIostatISTICS AND BIOINFORMATICS</p>
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Objective:

- Students will be able to understand the process of data collection, evaluation and presentation.
- Bio systematic methods will be helpful to them in evaluating and representing the research data in a valid form.

Unit	Sub Unit	Content	Credit									
1		Biostatistics – Scope <ul style="list-style-type: none"> • Principle and scope of statistical methods in biological research • Sampling, Data- types, Data Collection, Presentation of data • Measures of central tendency- Mean, median, mode 	1									
2		Biostatistics – Methods <ul style="list-style-type: none"> • Standard deviation/ error, Coefficient of variation, confidence limits, Tests of statistical significance (chi square, student t test) • Probability - definitions of various events in probability, laws. • Linear correlation, Linear regression, ANOVA, Use of computer in statistical analysis 	1									
3		Basics of Computers <ul style="list-style-type: none"> • Introduction to Bioinformatics and basics of computers • Operating systems • Databases 	1									
4		Practical <ul style="list-style-type: none"> • Practical based on Unit I, II and III 	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
	70	30	100				70					

REFERENCE BOOKS:

- Bioinformatics-A beginners Guide-Claverie J & Notredame C
- Developing Bioinformatics Computer Skills -Gibas C & Jambeck P
- The single Genetic Algorithm-Vose M D
- Bioinformatics-Sequence, structure and Databases –Higgins D & Taylor W.
- A Text Book of Biotechnology, R.C. Dubey, S. Chand Publication.



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-II</p> <p>Paper No: 2211201</p> <p>Compulsory</p>	<p>Subject: Botany Credit: 2</p> <p>: Title of the paper:</p> <p>Foundation course on research in botany -2</p>
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Objective of the course:

To enable students with the writing skills and survey of research project/ dissertation/Research paper.

Unit	Sub Unit	Content	Credit									
1		Sampling Fundamentals: <ul style="list-style-type: none"> Census and sample Survey, Steps in sample design; Different types sample design, Selection of a random sample, Estimation, Estimating the population mean and population proportion. 	1									
2		Interpretation and Report Writing: <ul style="list-style-type: none"> Meaning of interpretation; Techniques of interpretation; Precautions in Interpretation; Significance of Report writing; Different steps in Report writing; Layout of Research Project; Types of Reports; Patent writing and filing and Oral presentation 	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:

- Kothari, C.R; II ed. (2006), Research Methodology, Methods and techniques; New Age International (p) Ltd., Publishers, New Delhi.
- Kumar K. L.' (1997), Educational Technology, New Age International (P) Ltd., New Delhi.
- Donald R. Cooper, Pamela S. etc., Business Research Methods, 8th Edition, Tata McGraw Hill Co.Ltd.2006
- Tony Bates A.W. Technology, (2005), e-Learning and Distance Education, New York



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: 1310500</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 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		<ul style="list-style-type: none"> • Introduction to Information Technology Definition, Scope, Levels and Types of Information Properties and need of information Value of information, Resistance to information flow, Caution against over usage of information technology Concept of information and communication technology 	1									
2		<ul style="list-style-type: none"> • Understanding of communication process Concept of communication, needs of communication, communication process: Shannon model Types of communication: Target related, Process related, message related, Direction related Barriers to communication Factors affecting communication Effective classroom communication 	1									
3		<ul style="list-style-type: none"> • Communication Medias and Network Technology Meaning, Characteristics and psychological basis for classification of media Concept, Importance and creation of: Educational animation, Multimedia, Talking book, e-book, CAI, CAL etc. Internet: Meaning, Working method, usefulness available services. Educational use of email, video, audio conferencing, chat, Face book, tweeter Concept and usefulness of institutional website online-offline learning 	1									
4		<ul style="list-style-type: none"> • Use of Computer in Research and Education Search engine: Searching and location gaps and related literature Coding Classification and analysis of data through SPSS, Excel Report writing through word processor Creating, Teaching Learning Material Power Point presentation Computer Assisted Learning Program Learning Material Animation : Flash 	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		2	2	5	5	5	15	30	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, authored by Joan Lambert, Pearson Education, 2015
- Microsoft Excel 2016 Step by Step, authored by Curtis Frye, Pearson Education, 2015
- Microsoft PowerPoint 2016 Step by Step, authored by Kevin Wilson, Pearson Education, 2015



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<p>M.Sc.,M.Ed.</p> <p>Semester-III</p> <p>Paper No: 1310600</p> <p>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 different 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		<ul style="list-style-type: none"> METHODS OF RESEARCH Historical method: Meaning, Purposes, Primary and Secondary sources, External and Internal criticism of sources, steps in conducting historical studies. Survey Method: Meaning and types of survey Steps of conducting survey Inter relationship studies: case study, causal comparative study correlation study Developmental studies: longitudinal and cross sectional studies. 	1									
2		<ul style="list-style-type: none"> METHODS OF RESEARCH-2 Experimental research method: Meaning and characteristics, Method of acquiring control, Internal and external validity, Various types of experimental designs. Concept and characteristics of qualitative research, comparison with quantitative research. Ethnographic studies Content analysis method 	1									
3		<ul style="list-style-type: none"> TREATMENT OF DATA Levels of measurement data Meaning of treatment of data, editing coding classification tabulation Selection of Technique for analysis of data descriptive and inferential statistics Conclusions generalization and implications 	1									
4		<ul style="list-style-type: none"> WRITING RESEARCH REPORT 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. Format, style, typing, quotations, footnotes, bibliography, pagination, tables, figures, graphs Criteria for evaluating research report Avoiding plagiarism 	1									
Assessment & Evaluation	Credit		Internal					External			Total O/o 70	
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam				
	4	0	5	5	5	15	30	Theory	Practical	Total		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:

- Agrawal Y.P. (1988) Better Sampling: Concepts, Techniques and Evaluation. New Delhi: Sterling Publishers Private Ltd.
- Anastasi, A. (1988) Psychological Testing New York: the Macmillan company
- Backstrom, C.H. & Gerald, Hursh-cesar. (1981) Survey Research New York, John Wiley & Sons
- Best j.w. (1993) research in education, New Delhi: Prentice-Hall of India Pvt. Ltd.
- Bogdan, R and Taylor, S.J. (1975) Introduction to Qualitative Research Methods. New York, John Wiley & Sons
- Bogdan R.C. & Biklen, S.K. (1998) Introduction to Qualitative Research of Education: An Introduction to Theory and Methods Boston: Allyn and Bacon
- BUCH, M.B., (Ed) (1974) A survey of research in, education, MSU, Baroda, CASE
- BUCH, M. B., (Ed) (1979) Second survey of research in education, Baroda, SERD,
- BUCH, M.B. (Ed) (1986) Third survey of research in education, New Delhi, NCERT,
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- Denzin, N. K. and Lincoln, Y.s. (EDS) (2000) Handbook of Qualitative Research, London : Sage
- Desai, H.G. (1979) Style Manual for dissertations/Theses Rajkot : Saurashtra University
- Edwards, A.L. (1957) Techniques of Attitude Scale Construction New York: Appleton Century Crofts . Inc
- Gall, M.D., Gall, J.P. and Borg, W.R. (2007) Educational Research: An Introduction, Boston: Allyn and Bacon New Delhi
- ઉચાટ, ડી.એ. અને અન્યો (સ) (૨૦૦૬) શૈક્ષણિક સંશોધનનો સારાંશ (૧૯૭૮-૨૦૦૬) રાજકોટ:શિક્ષણશાસ્ત્ર ભવન, સૌરાષ્ટ્ર યુનિવર્સિટી
- ત્રિવેદી, એમ.ડી. અને પારેખ, બી.યુ. (૧૯૮૮) શિક્ષણમાં આંકડાશાસ્ત્ર, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- દેસાઈ, એચ.જી. અને દેસાઈ, કે. જી. (૧૯૮૭) સંશોધન પદ્ધતિઓ અને પ્રવિધિઓ, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- દેસાઈ, એચ.જી. અને દેસાઈ, કે. જી. (૧૯૮૪) મનોવૈજ્ઞાનિક માપન, અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- પટેલ આર. એસ. (સં) (૨૦૦૮) એમ.એડ. લઘુશોધ નિબંધના સારાંશ: અમદાવાદ, જય પબ્લીકેશન.
- મોદી, ડી.જી. અને અન્યો (૧૯૯૧) સંશોધનોની માધુકરી, ભાવનગર શિક્ષણશાસ્ત્ર ભવન, ભાવનગર યુનિવર્સિટી
- 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		<ul style="list-style-type: none"> • Learning: Meaning and concept Meaning of learning Learning: a complex, automated and continuous process Prerequisites for learning Pre-learnt behaviors (experiences) Process of acquisition Learning languages (Primary and secondary) Effective learning 	1								
2		<ul style="list-style-type: none"> • Approaches, Methods and Techniques Learning: A process Learning through association Acquisition Process of socialization Activity based learning Instructor lead learning Self-learning Techniques Learning by doing 	1								
3		<ul style="list-style-type: none"> • Programmed Learning Workshop/symposia Role-play/Drama Models of teaching 	1								
4		<ul style="list-style-type: none"> • eLearning Meaning, Logic and importance Use of computer aided package of learning Technology mediated learning Techniques of enhancing learning through technology 	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	

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
- Bloom, Benjamin: Taxonomy of educational objectives: the classification of educational goals. New York, Longmans, Green, 1956
- 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 Pravrutti Ane Shikshan.
- Joseph, K.S.(2003). Learning to Educate, Vadodara, Gold Rock Publications,
- Worwick, D. (1971). Team Teaching, U.K., University of London Press Ltd.,
- Aggarwal, J.C. (2010). Principles, Methods and Techniques of Teaching, Vikas Publishing House PVT Ltd., Noida. New Delhi



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-III</p> <p>Paper No: 1310800</p> <p>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;">Dissertation</p>
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Objective of the course:

- To enable students 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"> • Identification of research Problem 	2																																					
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #8B4513; color: white;"> <th rowspan="3" style="width: 15%;">Assessment & Evaluation</th> <th colspan="2">Credit</th> <th colspan="5">Internal</th> <th colspan="3">External</th> <th rowspan="3">Total O/o</th> </tr> <tr style="background-color: #8B4513; color: white;"> <th rowspan="2">Theory</th> <th rowspan="2">Practical</th> <th rowspan="2">Assignment</th> <th rowspan="2">Project</th> <th rowspan="2">Seminar</th> <th rowspan="2">Test</th> <th rowspan="2">Total</th> <th colspan="3">Sem. End Exam</th> </tr> <tr style="background-color: #8B4513; color: white;"> <th>Theory</th> <th>Practical</th> <th>Total</th> </tr> </thead> <tbody> <tr style="background-color: #8B4513; color: white;"> <td></td> <td>0</td> <td>2</td> <td>10</td> <td>10</td> <td>10</td> <td>20</td> <td>50</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>				Assessment & Evaluation	Credit		Internal					External			Total O/o	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Theory	Practical	Total		0	2	10	10	10	20	50	0	0	0	0
Assessment & Evaluation	Credit		Internal					External			Total O/o																													
	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:

- <http://shodhganga.inflibnet.ac.in/>
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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: 2311301</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">APPLIED PLANT SCIENCES</p>
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Objective of the course:

- Students will learn the traditional and modern utilization of plants and they will be able to correlate the evolution of plant association of human culture.
- They will also become aware about the importance of traditional herbal medicines used by ethnic people of India which is an important aspect of traditional knowledge conservation.
- Students will be able to associate the traditional herbal medicines with their photochemical in order to check the possibilities of validation of that traditional knowledge scientifically.

Unit	Sub Unit	Content	Credit								
1		Phytoresources <ul style="list-style-type: none"> • Origins of agriculture, World centers of primary diversity of domesticated Plants; • Origin, evolution, botany, cultivation and uses of Food, forage-fodder fuel, Fiber, furnishings, flavours, Medicinal plants, and oil-yielding plants of Gujarat and India. • Non-wood forest products (NWFPs): Raw materials for paper – making, Gums and Resins, Dyes. 	1								
2		Ethnobotany and Conservation <ul style="list-style-type: none"> • Basic methods and approaches to study traditional knowledge, various sub disciplines • Scope, voucher specimen, verification, screening and potential applications • Conservation, principles, strategies, in situ – ex situ, protected areas, gene – seed banks, initiatives (international/ national), IUCN. 	1								
3		Phytochemistry and Pharmacognosy <ul style="list-style-type: none"> • Secondary metabolites, types – characteristics, extraction strategies, analysis, biosynthetic pathways and inter relationships • Pharmacognosy, morphology (macro – micro), methods, adulterants, quality control. • Role of Phytochemicals, commercial exploitations (cultivation, in vitro approaches), important medicinal plants with uses and yielding active principles from underground parts/ whole plant/ flowers/ fruits/ seeds. 	1								
4		Practical <ul style="list-style-type: none"> • Practical based on Unit –I, II and III 	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	

REFERENCE BOOKS:

- Dennison, C. 1999. A Guide to Protein Isolation. Kluwer Academic Publishers. Dordrecht, the Netherland.
- Dryer, R.L. and Lata, G.F. 1989. Experimental Biochemistry. Oxford University Press, New York.
- Hames, B.D. (ed.) 1998. Gel Electrophoresis of Proteins: A Practical Approach, (3rd Ed.). PAS, Oxford University Press, Oxford, U.K.
- Harborne, T.C. 1981. Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis. Chapman and Hall, London.
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- Economic Botany – by S. L. Kochhar
- Economic Botany – by A. V. S. S. Samba Murty
- Economic Botany – by Bendre & Kumar



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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:2311401</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">PLANT PHYSIOLOGY</p>
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Objective of the course:

- Students will be able to understand the various physiological phenomena taking place in plants.
- They will be able to correlate the physiological processes with the growth and development of plants.

Unit	Sub Unit	Content	Credit								
1		Water and Mineral Nutrition <ul style="list-style-type: none"> • Water, characteristics importance for plant, water absorption and transport, transpiration • Mineral nutrition, essential elements, importance and deficiency symptoms • Nitrogen metabolism, N in environment, assimilation, BNF 	1								
2		Major Pathways <ul style="list-style-type: none"> • Photosynthesis, photosynthetic apparatus, PS I & PS II, mechanism of electron – proton transport, carbon fixation (C3/ C4/ CAM), factors affecting photosynthesis, photorespiration • Respiration, Mitochondria, structure, glycolysis, TCA cycle, electron transport, ATP synthesis. 	1								
3		Growth and Development <ul style="list-style-type: none"> • Growth regulators, biosynthesis, bioassay, mechanism of action, physiological effects, applications (auxin, cytokinin, gibberellins, ABA, ethylene) • Physiological effects and role of jasmonic acid, polyamines, brassinosteroids, salicylic acid 	1								
4		Practical <ul style="list-style-type: none"> • Practical Based on Unit I, II and III 	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	

REFERENCE BOOKS:

- Salisbury, F.B. and Ross, C.W. 1992. Plant Physiology (4th edition). Wadsworth Publishing Co. California, USA.
- Singhal, G.S., Renger, G., Sopory, S.K., Irrgang, K.D. and Govindjee 1999. Concept in Photobiology: Photosynthesis and Photomorphogenesis. Narosa Publishing House, 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: 2311511</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Forestry</p>
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Objectives:

- Students will learn about the forest types, management and its importance which will help them to understand the importance of biodiversity wealth.
- Thorough understanding of soil conservation, management and silviculture will be helpful in practical application.

Unit	Sub Unit	Content	Credit
1		Forest types and management Types, role and necessity Agroforestry Plantation Forestry Social Forestry, Joint Forest Management Modern Nursery Technology	1
2		Silviculture General Principles and Systems Natural and Artificial regeneration of Forest Tree Physiology and Breeding Silviculture for Mangroves and Shoreline Vegetation Traditional and recent advances	1
3		Ecology of Soils and Hydrology Forest Soils Soil conservation Watershed management Reclamation of degraded problem areas integrated technology for eroded soils.	1
4		Practical based on Unit 1,2 and 3	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:

- Dwivedi AP. 1992. Agroforestry: Principles and Practices. Oxford & IBH.
- Khanna LS. 1996. Principle and Practice of Silviculture. International Book Distributors.
- Dwivedi AP. 1993. A Text Book of Silviculture. International Book Distributors.
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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: 2311521</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center; font-weight: bold;">MARINE BOTANY</p>
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Objectives:

- Mangroves are ecologically important plants and this paper will helpful to understand the importance, distribution and identification of mangroves.
- Students will also become familiar with other marine vegetation.

Unit	Sub Unit	Content	Credit										
1		Marine Plant Groups and Organisms: <ul style="list-style-type: none"> • Introduction and classification - Brief idea of plankton, Nekton, Benthos. Marine phytoplankton <ul style="list-style-type: none"> • Dinoflagellates. • Nanoplankton, • Ultraplankton, • Coccoliths. • Marine fungi, actinomycetes, lichens and bacteria: brief idea. • Corals, fossil mangroves: brief introduction. 	1										
2		Biodiversity of Mangroves: <ul style="list-style-type: none"> • Brief idea of creek, estuary, lagoon and delta. • Definition of the term 'mangrove', distribution – biogeography of Indian mangroves, east and west coast mangroves, mangrove shores and forests. • Salient features of important mangrove families such as rhizophoraceae, sonneratiaceae, avicenniaceae, myrsinaceae, acanthaceae etc. 	1										
3		Marine Vegetation <ul style="list-style-type: none"> • Salt marshes: taxonomy, distribution, morphological and anatomical adaptations. • Sea grasses: taxonomy, distribution, adaptations, morphology, anatomical features. • Sand dune vegetation: formation of coastal sand dunes. Dune vegetation, restoration and protection of dune ecosystem. 	1										
4		Practical <ul style="list-style-type: none"> • Study of mangrove associates and/or halophytes (Aeluropus, Halophila etc.) • Type study of mangroves from Rhizophoraceae. • Type study of mangroves from Avicenniaceae and Sonneratiaceae. • Type study of mangroves from Myrsinaceae and Acanthaceae. • Study of sand dune plants (Spinifex, Ipomoea etc.) • Study of characteristic features of Phaeophyceae Ex. Padina, Dictyota, Sargassum etc. • Study of characteristic features of Rhodophyceae Ex. Gracilaria, Gelidium, Hypnea etc. • Sampling and identification of phytoplankton. • Demonstration of phytoplankton / algal culture technique. 	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



Indian Institute of Teacher Education, Gujarat.

M.Sc.,M.Ed.

Semester-III

Paper No: 2311521

Elective

Subject: Botany

Credit: 4

: Title of the paper:

MARINE BOTANY

REFERENCE BOOKS:

- Chapman, V. J. (1976). Coastal Vegetation. II nd edition Pergamon Press. New York.
- Desikachary, T. V. (1975). Marine Plants. N. C. E. R. T. New Delhi.
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Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed. Semester-III Paper No: 2311601 Compulsory</p>	<p>Subject: Botany Credit: 2</p> <p>: Title of the paper: Foundation course on research in Botany-3</p>
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Objective of the course:

- To enable students with the research aspects of biological sciences.

Unit	Sub Unit	Content	Credit
		Project work related with subject	2

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	0	70	70	

REFERENCE BOOKS:

- Kothari, C.R; II ed. (2006), Research Methodology, Methods and techniques; New Age International (p) Ltd., New Delhi.
- Kumar K. L.' (1997), Educational Technology, New Age International (P) Ltd., New Delhi.
- Donald R. Cooper, Pamela S. etc., Business Research Methods, 8th Edition, Tata McGraw Hill Co.Ltd.2006
- Tony Bates A.W. Technology, (2005), e-Learning and Distance Education, New York



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-IV</p> <p>Paper No: 1410900</p> <p>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;">Philosophical Foundations 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		<ul style="list-style-type: none"> • Philosophy and Philosophy of Education nature and scope of philosophy process of philosophizes and philosophical attitude Basic branches of philosophy Metaphysics (2) epistemology (3) Axiology and core beliefs - educational implications. 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 	1									
2		<ul style="list-style-type: none"> • Philosophical 'isms' and education 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 	1									
3		<ul style="list-style-type: none"> • Indian school of philosophy and education 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. 	1									
4		<ul style="list-style-type: none"> • Indian Educational Thinkers Mahatma Gandhi Maharshi Arvind Rabindranath Tagore Pandit Deendayal Upadhyay 	1									
Assessment & Evaluation		Credit	Internal					External			Total O/o 70	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		4	0	5	5	5	15	30	Theory	Practical		Total

REFERENCE BOOKS:

- Gore, M.S. (1984) Education and Modernization in India, Rawat Publishers, Jaipur.
- Hanighurst, Robert et al. (1995) Society and Education, Boston: Allyn and Bacon.
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- Pandey, K.P. (1983) Perspective in Social Foundations of Education, Amita Prakashan, Gaziabad
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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 style="text-align: center;">Subject: Education Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">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 Meaning of instruction Instruction as a complex and continuous process Prerequisites for instruction 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 Slogans of instruction From known to unknown, From concrete to abstract, From simple to complex, From indefinite to definite, From analysis to synthesis, From particular to general Maxims of instruction Learning by doing Principle of creating interest 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 Effectiveness of teaching</p>	1
2		<p>• Approaches, Methods and Techniques Teachings skills and Techniques Different skills of teaching and their components Integrated use of skills and its importance Different approaches of instruction Different approaches to instruction and their merits and demerits. Systems approach Input-process-output model Cognitive approaches: Inquiry training, concept Attainment, advance organizer models. Inductive approach Deductive approach Activity based approach Constructivist approach Methods of instruction Teacher - centered (Lecture cum discussion, Demonstration, Mastery learning strategy) Pupil - centered (Self study, Self discovery, Problem-solving, Experimentation, Programmed instruction/Programmed Learning) 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.)</p>	1
3		<p>• 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 behavioural terms.</p>	1

4	<ul style="list-style-type: none"> • 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			
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Total O/o 70
	4	0	5	5	5	15	30	Theory	Practical	Total	
								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
- Bloom, Benjamin: Taxonomy of educational objectives: the classification of educational goals. New York, Longmans, Green, 1956
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- Joseph, K.S.(2003). Learning to Educate, Vadodara, Gold Rock Publications,
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Indian Institute of Teacher Education, Gujarat.

M.Sc., M.Ed.

Semester-IV

Paper No: 1411100

Compulsory

Subject: Education

Credit: 4

Psychological Foundations of Education – 2

Objective of the course:

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

Unit	Sub Unit	Content	Credit
1		Intelligence, Creativity, interest & Aptitude	1
		Intelligence: Meaning & definitions Types of Intelligence Intelligence Theories : Two-Factor, Group Factor, Multi-Factor, Guilford, Cattell, Vernon	
		Measurement of Intelligence: IQ: Meaning Types of IQ Test Uses and Limitations of IQ test Introduction to various IQ tests available in Gujarati	
		Creativity: Nature and Characteristics Stages of Development of Creativity Suggestions to Develop Creativity of the Students	
		Interest & Aptitude: Meaning & Types of interest Meaning & definitions of aptitude Introduction to various interest inventory & aptitude tests	
2		Theory of Personality	1
		Factors of Personality: Id, Ego, Super Ego Factors affecting Personality: Mind (Conscious, Pre Conscious, Unconscious) Oedipus Complex, Electra Complex, Sibling Rivalry Stages of Personality Development	
		Jung's Theory of Personality: 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	
		Rogers' Theory of Personality: Assumptions of Rogers' Theory of Personality Development of Personality Fully Functioning Person	
		Erikson's Theory of Personality: Factors Affecting Personality: Ego, Social Factors Culture, Sexual Instincts, Childhood Experiences Stages of Personality Development Educational Implications	
3		Measurement of personality and Mental Health	1
		Measurement of personality: Subjective Methods of Personality Measurement Objective Methods of Personality Measurement Projective Methods of Personality Measurement	

		Adjustment & Mental Health: • Meaning and Definition Characteristics of well-adjusted persons Factors affecting adjustment Maladjustment : Reasons & suggestions to overcome mal - adjustment									
		Defense Mechanism: Meaning and Definition Various defense mechanisms									
		Mental Health: Mental health & hygiene: Meaning & Definition Factors affecting mental health Characteristics of mentally healthy person									
4		Group Dynamics Communication						1			
		Group & Group Dynamics: Meaning & Definition Characteristics & Types of human group Factors affecting group dynamics Educational Implications of group dynamics									
		Thinking: Meaning, Definition & Characteristics of Thinking Types, Methods & Tools of Thinking Essentials of Effective Thinking									
		Reasoning: Meaning, Definition & Characteristics of Reasoning Kinds & Steps of Reasoning Role of teacher in developing reasoning of students									
		Communication: 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	Sem. End Exam			
								Theory	Practical		Total
4	0	5	5	5	15	30	70	0	70	70	

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English

- 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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Gujarati

- ભટ્ટ કુસુમબેન કે. (૧૯૮૬) વ્યક્તિત્વના સિદ્ધાંતો. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- હંસાઈ કે. જી., સી. ટી., ભોપતકાર અને જી. એચ. શાહ (૧૯૮૧) મનોવિજ્ઞાનક પારિભાષા અને વિભાવના. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- દોગા નનુભાઈ (૧૯૯૫) અધ્યાપન મનોવિજ્ઞાન. રાજકોટ: નેજીજન સાયકો સેન્ટર
- દોગા નનુભાઈ, (૨૦૦૭) અધ્યયનનું મનોવિજ્ઞાન. રાજકોટ: નેજીજન સાયકો સેન્ટર.
- શાહ ગુણવંત (૧૯૭૮) અધ્યયનનું મનોવિજ્ઞાન. રાજકોટ: નેજીજન સાયકો સેન્ટર
- શુક્લ સૈતીશ પ્રકાશ. (૨૦૧૨) અધ્યેતા સ્વરૂપ અને વિકાસ. આગરા અગવાલ પ્રકાશન.
- ભટ્ટ કુસુમબેન કે. (૧૯૮૬) વ્યક્તિત્વના સિદ્ધાંતો. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ
- હંસાઈ કે. જી., સી. ટી., ભોપતકાર અને જી. એચ. શાહ (૧૯૮૧) મનોવિજ્ઞાનક પારિભાષા અને વિભાવના. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ

Hindi

- Pathak, P. D. (2009) **शिक्षा मनावज्ञान**. Agra : Agrawal Publications.
- Pathak, P. D. (2008) **इन्द्रिय एव परामर्श**. Agra : Vinod PustakMandir.
- Sharma, Rakesh & Manisha, Joshi (2011) **आधुनिकता का विकास एवं शिक्षण आधुनिकता**. Agra : Agrawal Publications.



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: 1400200</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Education Credit: 2</p> <p>: Title of the paper:</p> <p>Dissertation</p>
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Objective of the course:
To enable students to develop research culture.
To enable students to appreciate ethics in research

Unit	Sub Unit	Content	Credit								
1		Approval and registration of the title by respective guide	2								
		Presentation of research proposal									
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	

REFERENCE BOOKS:

Surveys of research in education Vol. 1 to 8 ed
<http://shodhganga.inflibnet.ac.in/>
 Buch, M. B. (Ed.1974). A Survey of Research in Education. Baroda: CASE The
 Maharaja Sayajirao University of Baroda.
 Buch, M. B. (Ed. 1979). Second Survey of Research in Education. Baroda: Society
 for Educational Research and Development, Baroda.
 Buch, M. B. (Ed. 1986). Third Survey of Research in Education. New Delhi: NCERT.
 Buch, M.B. (Ed. 1991). Fourth Survey of Research in Education. New Delhi: NCERT.
 Grewal, A. (1988). Developing, Validating and Testing the Efficacy of Self Learning
 Process Based Material for the Development of Some Integrated Processes in Science. An Independent Study. Bhopal,
 Regional College of Education. (ERIC funded), in Sharma, J. P. (Ed. 1997). Fifth Survey of Educational Research. New
 Delhi: NCERT
 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), Smruti Bulsari (Author), Sanjay Sinha (Author), Dreamtech
 Press (2011)
 Using SPSS In Research Paperback – 2016, by Dr. Radha Mohan (Author), Neelkamal Publications



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-IV</p> <p>Paper No: 2411701</p> <p>Compulsory</p>	<p>Subject: Botnay Credit: 4</p> <p>: Title of the paper:</p> <p>Analytical- Separation Technique and Bioinstrumentation</p>
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Objectives:

- Students will be able to understand the working of different instruments utilized in the research of plant sciences.
- Instrumentation will help students to apply their theory based knowledge about plants practically. It will open new paths for scientific research.

Unit	Sub Unit	Content	Credit									
1		Spectroscopic Methods: <ul style="list-style-type: none"> • Principles of biophysical methods used for analysis of Biomolecules, • Electrochemistry: pH meter – Principles and applications, • Electromagnetic Spectrum; Light, Absorption of Light, • Principle of Spectroscopy, • Types of spectrometer/detectors: UV, Visible • ORD/CD, Fluorescence, Infra-red spectroscopy, • NMR spectrometer 	1									
2		Chromatography <ul style="list-style-type: none"> • Principles of Chromatographic Separation, • Theory, principle and applications of Paper, Thin layer chromatography (TLC), • Gas chromatography; Centrifugation <ul style="list-style-type: none"> • Theory and Principles of Centrifugation, Sedimentation velocity and Sedimentation Equilibrium • Types of Centrifugation 	1									
3		Electrophoresis <ul style="list-style-type: none"> • Basic Principles of Electrophoresis, Factors affecting Separation, • Theory and Applications of Paper, Starch, Agarose and Polyacrylamide Gel Electrophoresis Blotting Techniques	1									
4		Practical based on Unit 1,2 and 3	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:

- Instrumental methods of analysis H.H.Wilard,L.L.Merritt, J A Dean.
- Instrumental Methods of Chemical analysis.
- Analytical Chemistry G.D. Chritiain. Wiley
- Introduction of instrumental a nalysis. R.P.Braun
- Essentials of Nuclear Chemistry- H.J.Arnika r
- A text book of quantitative Inorganic analysis A I Vogel.
- Pharma copie of India Britiesh Pharma copoeia
- Standard methods of Chemical a nalysis A Series of Volutms Edited F.J.Welcher R.G. Krieger publ -Company.
- Pri nci ples of Instrumental Analysis Fifth edition Skoog, Holler, Niemay.



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: 2411801</p> <p style="text-align: center;">Compulsory</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Pteridophyte and Gymnosperm</p>
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Objective of the course:

- Pteridophytes provide an important link in the evolution of plants. Through learning basics and evolution of pteridophytes, students will be able to correlate the evolution process.
- Paleobotany will help them to understand the plant fossils and the evolution process will become more easy to understand.

Unit	Sub Unit	Content	Credit									
1		Pteridophyta – Basics <ul style="list-style-type: none"> • General characters. • Origin and evolution • Alternation of generation, • Evolution of Stele, • Telome theory. • Classification –Smith and General Account of various groups 	1									
2		Pteridophyta – Evolution <ul style="list-style-type: none"> • General account of Fossil Pteridophyta - Asteroxylon, Miadesmia, Sigillaria and Calamophyton. • Spore producing parts and Soral Evolution. • Origin and development of Heterospory. • Origin of Seed habit • Distribution of Pteridophytes in India, • Economic importance 	1									
3		Gymnosperms <ul style="list-style-type: none"> • General characters, Classification by Coulter and Chamberlain, Sporne. • Origin and evolutionary trend – primary vasculature, secondary wood, leaf, gametophyte, male – female and embryo • Distribution of Gymnosperms in time and space (India). Economic Importance of Gymnosperms 	1									
4		Practical based on unit 1,2 and 3	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:

- Parihar, N.S... 1996. Biology and Morphology of Pteridophytes. Central Book Depot, Allahabad.
- Sporne, K.K. 1991. The Morphology of Pteridophytes. B.I. Publishing Pvt.Ltd. Bombay.
- Stewart, W.N. and Rathwell, G.W. 1993. Paleobotany and the Evolution of Plants. Cambridge University Press.
- Bhatnagar, S.P. and Moitra, A. 1996. Gymnosperms. New Age International Pvt.Ltd., New Delhi.
- Singh, H. 1978. Embryology of Gymnosperms. Encyclopaedia of Plant Anatomy X. Gebruder Bortraeger, Berlin



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<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: 2411911</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Plant Diversity and Human Welfare</p>
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Objective of the course:

- Students will thoroughly understand the all aspects of biodiversity, starting from its types, loss and conservation.
- They will also learn the practical aspect of biodiversity conservation and it will play an important role in their overall development as an aware citizen of India.

Unit	Sub Unit	Content	Credit								
1		<p>Plant diversity and its scope-</p> <ul style="list-style-type: none"> • Genetic diversity, Species diversity, • Plant diversity at the ecosystem level, • Agrobiodiversity and cultivated plant taxa, Wild taxa. <p>Values and uses of Biodiversity</p> <ul style="list-style-type: none"> • Ethical and aesthetic values, • Precautionary principle, • Methodologies for valuation, • Uses of plants, • Uses of microbes. 	1								
2		<p>Loss of Biodiversity:</p> <ul style="list-style-type: none"> • Loss of genetic diversity, species diversity, ecosystem diversity, agrobiodiversity, • Projected scenario for biodiversity loss, • Management of Plant Biodiversity: • Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; 	1								
3		<p>Conservation of Biodiversity:</p> <ul style="list-style-type: none"> • Conservation of genetic diversity, species diversity and ecosystem diversity, • In situ and ex situ conservation, • Social approaches to conservation, • Biodiversity awareness programmes, • Sustainable development. 	1								
4		<p>Role of plants in relation to Human Welfare;</p> <ul style="list-style-type: none"> • Importance of forestry their utilization and commercial aspects • Avenue trees, • Ornamental plants of India. • Alcoholic beverages through ages. 	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	

REFERENCE BOOKS:

- Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. N
- Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
- Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
- Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
- Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
- Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition



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<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: 2411921</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Soil and Plant Nutrition</p>
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Objective of the course:

- Each and every unit of this paper carries an important practical aspect in the field of agriculture which will help students to understand the basic requirement of soil and its improvement in order to improve crop production and crop quality.
- Soil testing and amendments will help them to sharpen their practical skills.

Unit	Sub Unit	Content	Credit									
1		Importance of Soil <ul style="list-style-type: none"> • Characteristic of soil • Importance • Origin • Classification of soil 	1									
2		Soil testing and amendments <ul style="list-style-type: none"> • Soil sampling, • Analysis and fertility, • Fertilizers, • Chemical-organic, • Conservation 	1									
3		Plant nutrition <ul style="list-style-type: none"> • Essential elements, • Deficiency symptoms, • Soil-root-microbe interaction, • Biological nitrogen fixation 	1									
4		Practicals based on unit 1,2 and 3	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	100			70					

REFERENCE BOOKS:

- E J Plaster Soil Science, Cengage publication New Delhi (2009)
- L Taiz and Zeiger E, Plant Phycology, Sinaure Association, Marsachusetts (1998)
- Noggle G. R. and Fritz G. J. Introductory Plant Physiology, Prentice-Hall of India, New Delhi (1992)



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<p>M.Sc.,M.Ed.</p> <p>Semester-IV</p> <p>Paper No: 2412001</p> <p>Compulsory</p>	<p>Subject: Botnay Credit: 2</p> <p>: Title of the paper:</p> <p>Foundation course on research in Botany -4</p>
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Objective of the course:

To enable students with the practical aspects of the subject by use of knowledge they gained

Unit	Sub Unit	Content	Credit								
		Research project	2								
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	00	70		70

REFERENCE BOOKS:

- Kothari, C.R; II ed. (2006), Research Methodology, Methods and techniques; New Age International (p) Ltd., New Delhi.
- Kumar K. L.' (1997), Educational Technology, New Age International (P) Ltd., New Delhi.
- Donald R. Cooper, Pamela S. etc., Business Research Methods, 8th Edition, Tata McGraw Hill Co.Ltd.2006
- Tony Bates A.W. Technology, (2005), e-Learning and Distance Education, New York



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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: 1511300</p> <p style="text-align: center;">compulsory</p>	<p style="text-align: center;">Subject: Education</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Psychological Testing</p>	<p style="text-align: right;">Credit: 4</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 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.
- To understand the role of Guidance Personnel and Counselor in different context of Guidance Services

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



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<p>M.Sc.,M.Ed.</p> <p>Semester-V</p> <p>Paper No: 1511400</p> <p>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;">Sociological Foundations of Education</p>
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Objective of the course:

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

Unit	Sub Unit	Content	Credit									
1		<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • 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. • Vinoba Bhave - Main points of thinking and Sociological concerns. 	1									
3		<ul style="list-style-type: none"> • 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 21st century Society: Scientific thinking, globalization and social impact, community development. 	1									
4		<ul style="list-style-type: none"> • 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	
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
		Theory	Practical				Total	Theory	Practical	Total		
		4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- Gore, M.S. (1984) Education and Modernization in India, Rawat Publishers, Jaipur.
- 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.,
- Maubnhein K. (1962) An Introduction to sociology of Educaiton, Routledge and Kegan Paul, London.
- M.H.R.D. (1990) Towards an Enlightened and Human Society. Department of Education, New Delhi
- Mossish, Loor (1972), Sociology of Education: An intorudction. George Lalen and Unwin, London
- Pandey, K.P. (1983) Perspective in Social Foundations of Education, Amita Prakashan, Gaziabad
- 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.
- Sodhi, T.S & Suri, Aruna (1998) Philosophical and Sociological Foundations of Education, Patiala: Bawa Publication.



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</p>	<p style="text-align: right;">Credit: 4</p>
<p style="font-size: 1.2em;">: Title of the paper:</p> <p style="font-size: 1.2em;">Educational Management</p>		

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		<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • 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 mapping, need, Factors and scope –Community participation in institutional planning Training (in service and pre service) 	1									
3		<ul style="list-style-type: none"> • Resource management and educational institute 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		<ul style="list-style-type: none"> • 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 <p style="text-align: center; font-weight: bold; font-size: 0.9em;">Practical</p> <p>Visit any educational institution and note down the various types of resources</p> <p>Visit of good educational institution and note down a reason for a good education institute</p> <p>Visit a good administrator and take his interview and give an observation on it.</p> <p>Case study of any good educational institute</p> <p>Case study of any bad educational institute</p> <p>Observation about relationship with teacher and head of management</p> <p>Write an essay on 'good educational institute'</p> <p>Classify any one school- material resources</p> <p>Classify any one school- human resources</p> <p>Take one activity of research in any school</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		



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:

- Anand W.P. Gurung, 'General Principles of Management for. Educational Planner and Administrator', UNESCO, 1984.
- Goeil S.D. Modern management Techniques new Delhi Deep and Deep 1987
- M. Narula, Quality In School Education Secondary Education Board –A NUEPA 2010, New Delhi
- T.K.D. Nair School Planning and Management 2009 , New Delhi
- S.K. Bhatia, Training and Development ' concept and practices' Deep and Deep publication, New Delhi
- Yazali Josephine, School resource planning and management - A NUEPA 2010, New Delhi
- Mc-grath basic management skill for 8th addition (ISBN-978-81-203-3542-4) PHI learning pvt. Ltd. New Delhi
- Hensley, Blanchard & Johnsons, management of organizational behavior leading human resources (9th additional) PHI learning pvt. Ltd. New Delhi
- Mc-Grath J H planning system for school executives in text educational publishers Francisco, 1972
- Peter G. north house leadership the ory and practice (south Asian Reprint) 5007 sage India and anstar
- Total quality management Dr. Mukhopadhyay
- શાળા સંચાલન બી.એસ. પ્રકાશન - અમદાવાદ
- શૈક્ષણિક વ્યવસ્થાપન - વાઘેલા ઈશ્વરભાઈ તથા દિપિકા મહિડા
- શૈક્ષણિક વ્યવસ્થાપન પ્રકાશક- માધ્યમિક શિક્ષણ બોર્ડ સહલેખકો -ડૉ. એ.બી. કગથરા, ડૉ. પલ્લવી પટેલ અને ડૉ. હરિભાઈ પટેલ વગેરે.



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;">: Title of the paper:</p> <p style="text-align: center;">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		<ul style="list-style-type: none"> • The measurement and evaluation Process & Theories of measurement Meaning of Educational Objectives, Learning Experiences and Learning outcomes Concept and need of evaluation, Inter relationship between measurement and evaluation Functions of evaluation & Basic principles of evaluation Classical Test Theory(CTT) : Concept, Characteristics and Importance Item Response Theory(IRT): Concept, Characteristics and Importance True scores and Errors of Measurement, Marks and Grades 	1									
2		<ul style="list-style-type: none"> • Objectives & Norm-Referenced and Criterion-Referenced Test Defining Objectives & Relating evaluation to objectives Taxonomy of educational objectives: Cognitive Domain Affective domain, Psychomotor domain Concepts of Norms Referenced and Criterion referenced Test Difference between NRT and CRT Steps for constructions of Criterion-Referenced Test : Instructional intent specifying the domain, item development, item review and test development. Types of tests: Achievement Test, Diagnostic Test, Domain-Referenced Test 	1									
3		<ul style="list-style-type: none"> • Tools of measurement and evaluation and standardized tests Subjective and objective tools; Scales, Questionnaires, Schedules Supply type questions: Simple question, completion question, short answer question, long answer question/essay questions (Characteristics, merits, limitations and improvement of each type). Selection type question: constant alternative, multiple choice, matching, Re-arrangement. (Characteristics, merits, limitations and improvement of selection type item). • Nature and use of standardized test. 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		<ul style="list-style-type: none"> • Process of Standardizing a test. Steps involved in standardization of a test. Reliability: Concepts and types of reliability. Validity: Concept and types of validity. Standard Scores and Norms: Z-score, t-score, stanine, Letter Grade, Percentile Rank. Emerging trends Semester System and Grading : Concept and process of grading Open text-book Examination, Question Bank : Meaning, Importance steps for construction, Use of computer in evaluation, Adaptive (Tailored) Testing 	1									
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		
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: 1511520

Optional

Subject: Education

Credit: 4

: Title of the paper:

Measurement and Evaluation

REFERENCE BOOKS:

- 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 Pustak Mandir.
- 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.
- Bloom, B. Hastings and Madaus. (1971). Handbook on Formative & Summative Evaluation of Student Learning. New York : Mcgraw Hill Book Co.
- Dave, R.H. (1969). Developments in Educational Testing Volume-I. London : University of London Press. P. 203-214
- Garrent, H.E. (1981). Statistics in Psychology and Education. Allied Pacific Pvt Ltd.
- Gronlund N.E. (1995). Measurement and Evaluation in Testing. (3rd Edn.). New York : Mac-Millan Publishing Co. Inc.
- Guilford J.P. (1993). Fundamental Statistics in Psychology and education. Tokyo : Mc- graw Hill.
- Hambleton, R.K.: Swaminathan, H. and Rogers, H.J. (1991). Fundamentals of Item Response Theory. C.A.: New bury park-Sage.
- Krathwohl, (1964). Educational Objectives. Affective Domain-Book II. New York: David Mckay Co.
- Popham, W.J. (1991). Modern Educational Measurement : A Practitioners Perspective. USA : Pentice Hall.
- Singh, Pritam. Criterion Referenced Testing : A Monograph. New Delhi : NCERT Publication.
- Sternberg, Robert J. and Grigorenko, Elena L. (2002). Dynamic Testing : The Nature and Measurement of Learning Potential. New York : Cambridge University Press, 40 West 20th Street, NY-10011-4211-USA
- Tabachnick, Barbara G. and Fidell, Linda S. (1989). Using Multivariate Statistics (2nd Edn.) New York : Harper & Row Publishers.
- દરજી, ડાહ્યાભાઈ. શૈક્ષણિક માપન અને મૂલ્યાંકનની પ્રવિધિઓ. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ.
- દેસાઈ, ધનવંત. શાળામાં મૂલ્યાંકન અને પરીક્ષણની શાસ્ત્રીય પદ્ધતિઓ. મુંબઈ-2: એ. આર. શેઠની કું.
- દેસાઈ, ધનવંત. અભિનવ શૈક્ષણિક મૂલ્યાંકન. અમદાવાદ: એ. આર. શેઠની કું.
- દેસાઈ, ધનવંત. શિક્ષકો માટે અભિનવ શૈક્ષણિક મૂલ્યાંકન. મુંબઈ-2: એ. આર. શેઠની કું.
- પટેલ, સી.એ. શૈક્ષણિક માપન અને મૂલ્યાંકન. અમદાવાદ: ગુજર પ્રકાશન.
- ડાભી, પ્રવીણ. જી. ક્ષમતાકેન્દ્રી સંતત મૂલ્યાંકન. અમદાવાદ: ગુજર પ્રકાશન.
- શાહ, રિખવભાઈ. પી. પરીક્ષા સુધારણાના સંસ્થાકીય કાર્યક્રમો. અમદાવાદ: ગુજરાત વિદ્યાપીઠ.
- શાહ, રિખવભાઈ. પી. પ્રશ્નબંધોન દ્વારા પરીક્ષા સુધારણા. અમદાવાદ: ગુજરાત વિદ્યાપીઠ.
- પંડ્યા, જયપ્રકાશ. જી. (2001). કલમ પ્રતિચાર સિદ્ધાંત દ્વારા મૂલક-સંદર્ભ માપન. અમદાવાદ: ગુજરાત વિદ્યાપીઠ.
- દેસાઈ, કે.જી. મનોવૈજ્ઞાનિક માપન. અમદાવાદ: યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ.
- અચવાલ, આર. એન. મનોવિજ્ઞાન ઓર શિક્ષા મેં માપન એવં મૂલ્યાંકન. આગરા: વિનોદ પુસ્તક મંદિર
- ગુપ્તા, એસ. પી. (1999). આધુનિક માપન તથા મૂલ્યાંકન. ફૈલાહાબાદ: શારદા પુસ્તક ભવન.



Indian Institute of Teacher Education, Gujarat.

M.Sc.M.Ed. Semester-V Paper No: 1511530 optional	Subject: Education Credit: 4 : Title of the paper: Yoga Education
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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	Theory	Practical	Total		
		2	2	5	5	5	15	30	35	35		70

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.pathofdivinelifelife.org
- Yoga – Its philosophy & Practice - Swami Ramdev



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: 1511600</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;">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								
2		Selecting appropriate psychological tests.	0.5								
3		Administering psychological tests.	0.5								
4		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
		2	10	10	10	20	50	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.



Indian Institute of Teacher Education, Gujarat.

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

- To enable students
- 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									
2		To refer the material from various sources.	0.5									
3		To write papers in different styles.	0.5									
4		To present the paper in seminar or workshop arranged for the purpose.	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:

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 Pa perback – Import, 22 Jun 2000, by Bruce Ballenger (Author), Pearson Publication

Research Methodology: A Theoretical Approach Pa perback –2014 by D. Na polean (Author), B. Balaji Sathya Na rayanan , La xmi Publications

Practical Approach to Research Methodology Pa perback – 2005 by S. P. Verma (Author) , Aka nsha Publishing

Research Methodology: A Guide for Researchers in Ma nagement a nd Social Sciences Paperback – 2006, by Taylor, Sinha, Ghos hal, (Author), Prentice Hall India Learning Private Limited; 1st Edition edition (2006)



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-V</p> <p>Paper No: 1511800</p> <p>Compulsory</p>	<p style="text-align: center;">Subject: Education</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Academic writing</p>	<p style="text-align: right;">Credit: 2</p>
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Objective of the course:

- To enable the students to understand the concept of different types of writing and writing style
- To enable the students to critically comment on the reports- project report, institutional report, minutes of staff meeting
- To enable the students to comprehend the academics in the form of books and films and talks by academicians
- To enable the students to be aware about the current trends in education
- To enable the students to present a seminar on various reports and policy documentation
- To enable the students to self-criticize, defend on their point, counter question the opponent on the academic presentations/cross question

Unit	Sub Unit	Content	Credit									
1		Types of Writing and Writing Styles Concept of Narrative, Descriptive and Persuasive Writing and Difference between narrative, descriptive and persuasive writing Concept of Theme paper and research paper and the difference between the two Writing of Project Reports, Field Visit Reports, Minutes of Staff Meeting Writing of Abstract, Executive Summary, Paraphrasing and Summarizing	0.5									
2		Writing a Review by Reviewing Surveys, Film and Speeches of Famous Academicians Review of TED Talks Review of Speech of A P J Abdul Kalam, Narendra Modi, Jawaharlal Nehru, Swami Vivekanand and M K Gandhi Review of Films-Ek Doctor Ki Maut, Aadhar Sheela, Dead Poets Society, Short Films related to Education • Reviewing the related literature from Surveys, Shodhganga, INFLIBNET, ERIC, Dissertation Abstract International	0.5									
3		Critical Analysis of Various Policies and Act (Group Activities on the basis of Divergent and Convergent thinking) New Education Policy, TeachR NCTE Regulation 2014 Two Year integrated B.Ed., M.Ed. B.Sc Ed and MSc Ed RTE 2009, UGC Regulation PhD 2009	0.5									
4		<ul style="list-style-type: none"> Writing of Research Proposal and Reporting Doctoral Thesis Steps of writing Research Proposal Reporting of Chart/Graphs and Tables-Explain, Compare and Narrate APA style of Writing and APA style of Referencing Plagiarism and Antiplagiarism Software 	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	5	5	5	15	30	0	70	70	70		

REFERENCE BOOKS:

- Bailey, S. (2003), Academic Writing: A Handbook for international Students
 Films-Ek Doctor Ki Maut, Aadhar Sheela, Dead Poets Society, Short Films
https://www.inflibnet.ac.in/ncte-india.org/ncte_new/pdf/NCFTE_2010.pdf
 Policy Documents Available on UGC, NCTE, NCFTE, MHRD websites
shodhganga.inflibnet.ac.in
www.apastyle.org/
[www.ka.u.edu.sa/.../academic-writing-handbook-international-students-3rd-ed%20\(2\)](http://www.ka.u.edu.sa/.../academic-writing-handbook-international-students-3rd-ed%20(2))
www.mhrd.gov.in
www.ncert.nic.in
www.ncte-india.org
www.ted.com/
www.ugc.ac.in



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-V</p> <p>Paper No: 1511900</p> <p>Compulsory</p>	<p>Subject: Education</p> <p style="font-size: 1.2em;">: Title of the paper:</p> <p style="font-size: 1.2em;">Internship</p>	<p>Credit: 2</p>
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Objective of the course:

- To enable student,
- 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
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
		2	10	10	10	20	50	0	0	0	

REFERENCE BOKS:

- 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.

<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: 2512101</p> <p style="text-align: center;">Compulsory</p>	<p>Subject: Botany</p> <p>: Title of the paper:</p> <p>PLANT BIOTECHNOLOGY</p>	<p>Credit: 4</p>
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Objectives:

- Students will learn all basic concepts of plant tissue culture with its practical application.
- They will also learn about the plant improvement through various techniques and it is of great importance in agriculture field.

Unit	Sub Unit	Content	Credit									
1		Plant Tissue Culture <ul style="list-style-type: none"> • General technique, Laboratory and equipments, Aseptic techniques, Nutrient medium, Plant growth regulators • Morphogenesis, Plant regeneration, Somatic embryogenesis, Advantages, Synthetic seeds 	1									
2		<i>In vitro</i> Production and germplasm conservation <ul style="list-style-type: none"> • Micropropagation, cloning, various stages, applications, • Haploids, androgenesis, various pathways, factors affecting, advantages – applications, gynogenesis • Germplasm conservation, slow growth, cryopreservation (freezing – thawing), cryoprotectants, applications 	1									
3		Plant Improvement and complementary Techniques <ul style="list-style-type: none"> • Somatic hybridization, protoplast isolation, culture, fusion, selection of hybrids, advantages. • Somaclonal variation, origin, factors inducing variations, cell selection, advantages • Distant hybridization, in vitro pollination/ fertilization, embryo culture, embryo – rescue, applications 	1									
4		Practical based on unit 1,2 and 3	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 BOKS:

- Bhojwani, S.S. 1990. Plant Tissue Culture: Theory and Practical (a revised edition). Elsevier Science Publishers, New York, USA.
- Bhojwani, S.S. 1996. Plant Tissue Culture: Application and Limitations. Elsevier Science Publishers, New York, USA.
- Vasil, I.K. and Thorpe, T.A. 1994. Plant Cell and Tissue Culture. Kluwer Academic Publishers, the Netherlands.
- Shantharam, S. and Montgomery, J.F. 1999. Biotechnology, Biosafety and Biodiversity. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Glick, B.R. and Thomson, J. E. 1993. Methods in Plant Molecular Biology and Biotechnology. CRC Press, Boca Raton, Florida.
- Glover, D. M. and Hames, B. D. (Eds.), 1995. DNA Cloning 1: A Practical Approach; Core Techniques, (2nd edition). PAS, IRL Press at Oxford University Press, Oxford.
- Hackett, P.B., Fuchs, J.A. and Messing, J. W. 1988. An introduction to Recombinant DNA Techniques: Basic Experiments in Gene Manipulation. The Benjamin / Cummings Publishing Co., Inc Menio Park, California.



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: 2512211</p> <p style="text-align: center;">Elective</p>	<p>Subject: Botany</p> <p>: Title of the paper:</p> <p>Horticulture</p>	<p>Credit: 4</p>
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Objectives:

- Horticulture is a technique to improve the plants and to develop new varieties. This paper will give thorough understanding to the students about the same.
- This paper also contains the commercial aspect of plants. So, it will also help students to develop new commercially applicable ideas.

Unit	Sub Unit	Content	Credit									
1		Fundamentals of Horticulture <ul style="list-style-type: none"> • Definition, branches, importance and scope • Classification of Horticultural Crops • Special horticultural practices 	1									
2		Soil and water considerations <ul style="list-style-type: none"> • Formation of soil • Classification, physical and chemical properties • Soil media, nutrients and manuring • Symptoms of excesses and deficiencies of nutrients • Plant growth regulators 	1									
3		Plant Propagation and Plant Protection <ul style="list-style-type: none"> • Propagation by specialized structures • Nursery based propagation • Role of Biotechnology • Pest management • Weed management 	1									
4		Practical based on unit 1,2 and 3	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:

- Adams, C.R. and M. P. Early. 2004. Principles of horticulture. Butterworth – Heinemann, Oxford University Press.
- Bansil, P.C. 2008. Horticulture in India. CBS Publishers and Distributors, New Delhi.
- Kumar, N.1997. Introduction to Horticulture, Rajalakshmi Publication, Nagercoil. Further reading
- Bhattacharjee.S.K. 2006. Amenity Horticulture, Biotechnology and Post harvest technology. Pointer publishers. Jaipur
- Chadha, K.L. 2001, Handbook of Horticulture, ICAR, New Delhi. 3. Chandra, R. and M. Mishra. 2003. Micropropagation of horticultural crops. International Book Distributing Co., Lucknow.
- Chattopadhyaya, P.K.2001. A text book on Pomology (Fundamentals of fruit growing) Kalyani Publication, New Delhi
- Christopher, E.P. 2001. Introductory Horticulture, Biotech Books, New Delhi
- Edmond, J.B. T.L.Senn, F.S. Andrews and P.G.Halfacre, 1975. Fundamentals of Horticulture, Tata MC. Graw Hill Publishing Co.New Delhi
- George Acquaah, 2002, Horticulture-principles and practices. Prentice-Hall of India Pvt. Ltd., New Delhi.
- Hartman, H.T. and Kester, D.E. 1986. Plant propagation – Principles and Practices – Prentice Hall of India Ltd., New Delhi.



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: 2512221</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Medicinal Botany</p>
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Objective:

- Herbal medicines are booming nowadays. This paper contains detailed study about medicinal plants which will be helpful to the students in handling medicinal plants.
- Study of phytochemistry will help them to correlate the herbal medicine with its constituent and its impact. This will help students to provide their scientific contribution in the field of herbal medicines.

Unit	Sub Unit	Content	Credit								
1		Classification and distribution <ul style="list-style-type: none"> • Classification • Plant parts • Phytochemicals and diseases • Distribution in the state, country and global 	1								
2		Cultivation and utilization <ul style="list-style-type: none"> • Methods of cultivation • Harvesting, storage and utilization (preparation) • Different systems of medicine 	1								
3		Medicinal plants and uses <ul style="list-style-type: none"> • Family wise (at least three plants from each family) medicinal plants • Major phytochemicals and use Value addition <ul style="list-style-type: none"> • Photochemistry, • Biosynthetic relationships • Extract analysis and modern approaches 	1								
4		Practical based on unit 1,2 and 3	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	

REFERENCE BOOKS:

- Desai et al, Medicinal plants, Bharatiya Kala Prakashan, New Delhi (2007)
- Pandey C. N. et al Medicinal Plants of Gujarat, GEER Foundation and Gandhinagar (2005)
- Cseke et al, Natural Products from Plants, CRC Press, Boca Raton (2006)



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 Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">TEACHER EDUCATION</p>
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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.
- To enable the students to understand the role and responsibility of various organizations in Teacher Education.

Unit	Sub Unit	Content	Credit															
1		<ul style="list-style-type: none"> • 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 Teacher Education in Ancient India Teacher Education in Pre-Independence Period Teacher Education in Post-Independence Period Teacher Education as perceived in NPE – 1986 and NCFTE – 2009 	1															
2		<ul style="list-style-type: none"> • 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: <table style="width: 100%; border: none;"> <tr> <td>1 UGC</td> <td>4</td> <td>IITE</td> <td>7</td> <td>CASE</td> </tr> <tr> <td>2 NCERT</td> <td>5</td> <td>SCERT</td> <td>8</td> <td>IASEs</td> </tr> <tr> <td>3 NCTE</td> <td>6</td> <td>CTEs</td> <td>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		<ul style="list-style-type: none"> • Teacher Education in India Organizational Patterns D.Ed. /P.T.C.; B.El.Ed.; 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 - Foundation Courses Content cum mythologist Special Areas Practice Teaching Practical Work Limitations of Teacher Education with respect to organization 	1															
4		<ul style="list-style-type: none"> • Research, Problems, Innovations and Issues in Teacher Education 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 Teacher Performance Appraisal 	1															

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

REFERENCE BOKS:

- 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.
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- 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.

<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: 1612110</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; font-weight: bold;">Guidance and Counselling</p>
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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 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		<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> Types of Guidance Educational Guidance: Concept, needs and Characteristics Vocational guidance: Concept, needs and Characteristics • Personal Guidance: Concept, needs, and Characteristics <ul style="list-style-type: none"> Individual and Group Guidance: Purpose and Program Techniques of Group Guidance: Panel Discussion, Seminar, Exhibition, Career talk, Career Conference. 	1
2		<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Administration of Guidance Services 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 Government NGO Private Web services 	1
3		<ul style="list-style-type: none"> • Counseling: <ul style="list-style-type: none"> Concept and Nature, Principles of counseling. Counseling Process 	1

		<ul style="list-style-type: none"> Counseling approaches: Directive, Nondirective and Eclectic Types of Counseling: Group counseling vs. individual counseling. Counseling for adjustment Characteristics: Characteristics of good counseling. 									
4		<ul style="list-style-type: none"> Counseling Process: Preparation for Counseling Counseling skills Factors affecting Counseling process. Case study and Case conference: Purpose, Plan, Procedures, and Precautions Group Counseling: Introduction and assumptions in group Counseling The process of group Counseling Values of group Counseling Limitations of group Counseling Preparation and Training for Counseling Academic preparation Qualities of a good Counselor Professional Ethics for Counselor Problems and Issues Organization and Administration of Guidance and Services Guidance services for Special Groups Changing roles of functionaries Appraisal 	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 BOKS:

- 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
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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.
- દસાઇ કે.જી. (૧૯૮૧) શૈક્ષણિક અને વ્યાવસાયિક માર્ગદર્શન પ્રવિધિઓ, યુનિવર્સિટી ગ્રંથનિર્માણ બોર્ડ, અમદાવાદ
- પટેલ એસ. એમ. (૧) સલાહ મનોવિજ્ઞાન, યુનિવર્સિટી ગ્રંથનિર્માણ બોર્ડ, અમદાવાદ
- પરીખ જે.સી. (૧૯૮૨) માર્ગદર્શન વ્યવહાર મિમાસા, અનડા પ્રકાશન, અમદાવાદ.



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

		(3) Impact of various documentation on curriculum like NPE-1986, NCF (2000) NCF 2005, NCFTE (2009)									
Assessment & Evaluation	Credit		Internal					External			
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Total O/o 70
								Theory	Practical	Total	
	4	0	5	5	5	15	30	70	0	70	70

REFERENCE BOOKS:

- Aggrawal, J.C. & Gupta S. (2000). Curriculum Development: New Delhi : Shipra Pub.
- Arora, G.L. (1984). Reflection in curriculum, New Delhi, NCERT.
- Caswell, H.L. and Campbell, D.S. (1935). Curriculum Development, N.Y. : Americal Book Co.
- Darji, D.R. and Lulla B.P. (1967). Curriculum Development in secondary schools of Baroda. Baroda :Sadhana Press.
- Deshmukh, V. (Ed., 2012). Winds of Reforms in Indian Education. New Delhi, Allantic.
- John Dewey (1902). The Child and The curriculum. Chicago : University of Chicago.
- Nicholls, A. and Nicholls, S. (1972). Developing a curriculum: A practical guide. London: George Allen & Unwin Ltd.
- Saylor, J.G. and Alexander W.M.(1974). Planning curriculum for schools. N.Y.: Holt, Richard and Winston. Inc.
- Sharma, S.R. (1999). Issues in curriculum administration. New Delhi: Pearl Pub. House.
- Sharma, R. (2002). Modern methods of curriculum organization Jaipur : Book Enclave.
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- Taba Hilda (1962). Curriculum Development: Theory and practice. N.Y. Harcourt, Brace & world Inc.
- Tyler, R.M. (1950). Basic principles of Curriculum Development. Chicago: University of Chicago press.
- Wiles, J. and Bondi, J., (1989). Curriculum Development, A Guide to practice. London: Merrill Pub. Co.
- Smith, S. and Shores, S. (1972). Fundamental, of curriculum Development. N.Y.: Harcourt, Brace & world Inc.
- દેસાઈ ડી.બી. અને દેખતાવાલા, પી.બી. (૧૯૮૫) અભ્યાસક્રમના સિધ્ધાંતો અને અભ્યાસક્રમ સંરચના 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-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</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Educational Statistics</p>	<p style="text-align: right;">Credit: 4</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		Statistics in Education <ul style="list-style-type: none"> • 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) • Measures of central tendency • Measures of variability: • Norms and Probability • Normal probability curve, skewness, kurtosis 	1									
2		Correlation, Regression & Statistical inference <ul style="list-style-type: none"> • 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. 	1									
3		Inferential Statistics <ul style="list-style-type: none"> • 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 	1									
4		Testing of null hypothesis and non-parametric methods <ul style="list-style-type: none"> • Testing of null hypothesis by chi-square test • • Non parametric methods • Meaning & scope • Candal's T-test • Candal's W-test • Mann-whitney U-test • • Use of parametric and non-parametric methods • 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 • Item analysis: Difficulty index, Discrimination index • Item objective congruence (IOC) in CRT • Factor Analysis • 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				
		Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			Total O/o 70
									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:

Educational Statistics

REFERENCE BOOKS:

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



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-VI</p> <p>Paper No: 1612200</p> <p>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 enable students
- to review teaching learning material.
- to understand teaching learning material.
- to presentation of teaching learning material

Unit	Sub Unit	Content	Credit						
1		<ul style="list-style-type: none"> • Presentation of Teaching Learning Material • Understanding Teaching Learning Material. • Selecting appropriate Teaching Learning Material. • Presentation of Teaching Learning Material. 	2						
Assessment & Evaluation	Credit		Internal				External		Total O/o 70 0
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam	
	0	2	10	10	10	20	50	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.

<p>M.Sc.,M.Ed.</p> <p>Semester-VI</p> <p>Paper No: 1612300</p> <p>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; font-size: 1.2em;">Internship</p>
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Objective of the course:

- To enable students
- 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		<ul style="list-style-type: none"> Internship in Teacher education institutions 	6					
Assessment & Evaluation		Credit	Total O/o 70					
		Internal		External				
		Theory		Practical	Assignment	Project	Seminar	Test
0	6	10	10	10	20	50	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.

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

- To enable students 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								
			4								
		<ul style="list-style-type: none"> • Data collection and carrying out Designed research • Summarizing and analyzing data • Writing research report 									
Assessment & Evaluation	Credit		Internal					External			Total O/o 70
	Theory	Practical	Assignment	Project	Seminar	Test	Total	Sem. End Exam			
								Theory	Practical	Total	
	2	10	10	10	10	20	50	0	0	0	

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 CR 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), Smruti Bulsari (Author), Sanjay Sinha (Author), Dreamtech Press (2011)
- Using SPSS In Research Paperback – 2016, by Dr. Radha Mohan (Author), Neelkamal Publications



Indian Institute of Teacher Education, Gujarat.

<p>M.Sc.,M.Ed.</p> <p>Semester-VI</p> <p>Paper No: 2612301</p> <p>Compulsory</p>	<p>Subject: Botany Credit: 4</p> <p>: Title of the paper:</p> <p>Phyto Resources - Utilization and Management</p>
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Objective :

- Thorough understanding of phyto-resources will help students to provide their contribution towards sustainable utilization of phyto-resources.
- The information about green-house technology and harvest technology will develop their better understanding toward the artificial favourable environment for the plants.

Unit	Sub Unit	Content	Credit									
1		Introduction <ul style="list-style-type: none"> • Concept, natural resources, biological resources, plants as natural resources • Management practices - need and methods • Utilization - Bioenergy, food, fodder, fibre, medicine and essences. • Plant Resources Processed – Jam, jelly, squash, ketchup, raisin, pickle and rubber • Unprocessed – Honey, timber, wood, tannins and latex 	1									
2		Plant resources used in cosmetics, aromatics and pharmaceuticals <ul style="list-style-type: none"> • Introduction and scope, Herbal preparations, Methods of extraction – • Aloe, Henna, Lemon grass, Rose, Turmeric, Ginger, Neem, Amala • with reference to part used, products and uses 	1									
3		Harvest Technology <ul style="list-style-type: none"> • Harvest technology management for fruits, • Flowers and medicinal plants • Artificial ripening, • Maturity indices, • Methods of picking Post-harvest technology and management for fruits, • Flowers and medicinal plants – Grading, processing, storage and packing 	1									
4		Practical based on units 1,2 and 3	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:

- Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
- Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
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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: 2612411</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">ENVIRONMENT SCIENCES</p>
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Objective:

- Students will be able to understand the major environmental issues thoroughly with the possible correction measure for the same.

Unit	Sub Unit	Content	Credit								
1		Green house effect, global warming and depletion of ozone layer <ul style="list-style-type: none"> Introduction Greenhouse Gases and Global Climate Changes, Global Warming Potential, Possible Impact of Global Warming, Greenhouse Effect – Policy Response, Kyoto Protocol, El NINO- Climate Cycle, Ozone in the Atmosphere, Ozone Depletion Process, Ozone Hole Worldwide Ozone Trends, The Montreal Protocol, Consequence of Ozone Depletion. Aerosol types 	1								
2		Acid Rain, Atmosphere Turbidity and Nuclear <ul style="list-style-type: none"> Introduction, Nature and Development of Acid Rain, Acid Rain and Geology, Acid Rain and Aquatic Environment, Terrestrial Environment, Build Environment, Impact of Acid rain on human health and it Mitigation Production and Distribution, Atmospheric Turbidity – Natural and Man-made Sources, Nuclear Winter. 	1								
3		Global Carbon Dioxide-Rise and Impact on Biosphere Vehicle Pollution <ul style="list-style-type: none"> Introduction, Consequences of global CO₂ changes, Strategies for Conservation of Environmental Changes Induced by CO Rise, Automobile Emission Characteristics, Impact of Automobile Pollutants, The Indian Scenario, Automobile Pollution Abatement. Carbon credit and trading 	1								
4		Practical <ul style="list-style-type: none"> Practical based on Unit –I, II and III 	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	

REFERENCE BOOKS:

- S.C. Santra, "Environmental Science", 2nd Edition, New Central Book Agency (P) Ltd, Kolkata, India, 2005.
- Joner J.AA., "Global Hydrology : Processes, Resources and Environment", Longman, Essenx, England, 1997.
- Wilson E.O., "Biodiversity", National Academy Press, Washinton, DC, 1988.
- Tudge, Colin, "Global Ecology", Oup, New York, 1991.
- Bridgeman, Howard, "Global Air Pollution: Problems for the 1990S", Belhaven Press, New York, 1991.
- Mauahan S.E., "Environmental Chemistry", Willaw Grant Press, Beston, USA, 1983.
- Moeller, Dave W., "Environmental Health", Mass : Harvard University Press, Cambridge, 1992.



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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: 2612421</p> <p style="text-align: center;">Elective</p>	<p style="text-align: center;">Subject: Botany Credit: 4</p> <p style="text-align: center;">: Title of the paper:</p> <p style="text-align: center;">Plant Organism Interactions</p>
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Objective of the course:

- Students will learn the major associations between different plant types.

Unit	Sub Unit	Content	Credit								
1		Plant-Plant interactions <ul style="list-style-type: none"> • Introduction • Allelopathy in plants • Parasitic association in plants • Competitive mechanisms in plants • Epiphytic plants 	1								
2		Herbivory and Carnivorous Plants <ul style="list-style-type: none"> • Herbivores–insect-plant interaction • Carnivorous plants – morphological features, specialized biochemical mechanisms for nutrient processing 	1								
3		Symbiotic Associations <ul style="list-style-type: none"> • Lichens • Endophytic association of plants – algae, bacteria, fungi • Mycorrhizae • Nodulating bacteria • Algae and coral relationships 	1								
4		Practical based on units 1,2 and 3	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	

REFERENCE BOOKS:

- Walter Larcher 1995 "Physiological Plant Ecology". 3rd Eds. Springer – Verlag, New York Berlin Heidelberg Page | 59
- Zdenek Lastuvka, Barbara Politycka, S. S. Narwal, Jana Kalinova 2007, "Coactions and Competition in Higher Plants", Scientific Publisher (India).
- Malcolm C. Press, Jonathan D. Graves 1995, "Parasitic Plants", Chapman & Hall, 2-6 Boundary Row, London.
- Peter Scott 2008, "Physiology and Behaviour of Plants". John Wiley & Sons Ltd.
- R.S. Mehrotra. Introduction to Mycology. Wiley Eastern. Hans Lamberts and Thijs L. Pons Plant Physiological Ecology, Springer Publication