

**GUJARAT VIDYAPEETH
AHMEDABAD**

M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar

Department of Microbiology

**Semester-II
(In Force from June-2010)**

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
BIO-201: Biology
(Syllabus of theoretical portion) (In force from June, 2010)
Total Mark: 50= External Evaluation: 40 Marks +
Internal Evaluation: 10Marks)
(Total Teaching Hours=30, Credit=02)

UNIT: I	Morphology, Taxonomy economic, Embryology & Ecology	08 HOURS
	Morphology	
	1 Inflorescence	
	• Raceme- caesalpinia	
	• Spike- Achyranthus	
	• Capitulum-Sunflower	
	• Cymose-Solitary – Terminal-Datura	
	• Axillary - Hibiscus	
	• Biparous- Clerodendron	
	• Multiparous- Nerium	
	2 Astiuation	
	3 Placentation	
	(2) Taxonomy	
	• General Characters, Floral structure & floral formula, floral diagram & common example of economic importance Family- Malvaceae, Apocynaceae, Nyctaginaceae, Gramineae	
	Economic Botany	
(3)	Medical Plants	07 HOURS
	(1) Ginger	
	(2) Adhatoda	
	(3) Neem	
	(4) Raucelfia	
	(5) Ocimum	
	(6) withania	
	(7) Aloe	
	(8) Tinospora	
	(4) Applied Botany	
	• Horticulture	
	• Sericulture	
	• Apiculture	
	• Agronomy (Agriculture)	
	• Forestry	
	• Floriculture,	

Unit-II Embryology	07 HOURS
<ul style="list-style-type: none"> • Ovule structure • Structure of Microsporangium (T.S. of Anther) • Female gametophyte (Empro.Sac) • Polygonum type, • Male gametophyte • Double fertilization • Capsella type of Embryo Or (Crucifer) • Type of Endosperms 	
Unit-III Cytology	08 HOURS
<ul style="list-style-type: none"> • Cell division – mitosis, meiosis • Cell cycle • Structure and function of cell organelles. • Cell membrane, • Endocyttoplasmic Reticulum, • Lysosome, • Golgi complex, • Nucleus 	
Unit-IV Genetics and ecology	
Gene concept	
Sex determination	
Ecology	
<ul style="list-style-type: none"> • Ecosystem: components of ecosystem • flow of energy in ecosystem, Ecological Pyramid • Ecological adaptation • Hydrophytes- Hydrilla & Xlyaphea • Xerophytes- Casurina & Nerium Ecological adaptation in Birds & Parasites 	
* Reference books	
(1)	Systematic Botany R.N.Sutaria
(2)	Embryology of Angiosperms P Maheshwari TaTa Mcgraw hill Publishing Company LTD Bombay-NewDelhi
(3)	The embryology of Angioperms S.S.Bhojwani & S.P.Bhatnagar Vikas Publishing home Pvt .LTD NewDelhi
(4)	Basic Ecology Saunder Philadephic Odum EP 1983
(5)	Fundamentals of Ecology Madhab C. Dash
(6)	Cytology-2004 P.S.Verma & Agarwall S.Chand & Company Ltd Ramnagar New Delhi
(7)	Genetics A.M.winchester Oxford & IBH Publishing Co Culcutta Bombay New Delhi
(8)	ELDONGARDNER Genetics

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
BIO-201: Biology
(Syllabus of Practical portion) (In force from June, 2010)
Total Mark: 25= External Evaluation: 20 Marks +
Internal Evaluation: 05Marks)
(Total Teaching Hours=45, Credit=02)

Unit –I Morphology

1. Study of inflorescence
 - Raceme-caesalpinia
 - Spike-Achyranthus
 - Capitulum-Sunflower
 - Solitary-Terminal-Datura
 - Axillary-Hibiscus
 - Biparous-Clerodendrom
 - Multiparous – Nerium
2. Study of Placentation
 - Marginal – Pea
 - Parginal – Cacurbita
 - Axile – Hibiscus
 - Free central – Porchulaca
 - Basal – Sunflower
 - Super ficial – Nympeha, poppy family
 - Malvaceae, apocynaceae, Nyctaginaceae
3. Medicinal plants
Study of botanical name, family, useful parts, chemical components and users of following plants
 - Ginger
 - Adhatoda
 - Sarpgandha
 - Ashwagandha
 - Neem
 - Ocimum
 - Aloe
 - Tinospora

Unit II Embryology

Study of pollen germination of stigma Ce.g. catharanthus rosea or any other flowers
Study through permanent slides
T. S. of Anther
Pllen germination
V. S. of Ovule (typical)
Embryo (W.M.)

Unit III Cytology-Genetics

Study of mitosis through (P.S.)
Electron micrographs of cell organelles
(a) Cell membrane
(b) E.R.
(c) Lysosome
(d) Golgicomplex
(e) Nucleus

Charts:

Sex determination

XX : XO

XX : XY

TYPE

DD : DY-XO

ZZ : ZW

Gynandromorphs, Hymenopteran

Unit-IV

Ecology

- To study ecological adaptations (morphological and anatomical) in plants
- Hydrophytes
- Submergal- Hydrilla
- Florating-Nampphea
- Xerophytes-Casurina & Nerium
- Ecological adaptation in Animals
 - Liverfluke
 - Ascaris
 - Pigeon

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
MIC-202: Basic techniques in Microbiology
(Syllabus of theoretical portion) (In force from June, 2010)
Total Mark: 50= External Evaluation: 40 Marks +
Internal Evaluation: 10Marks)
(Total Teaching Hours=30, Credit=02)

UNIT-1	Principle, Construction and working of instruments	08 Hours
	(a) Incubator (b) Hot air oven (c) Autoclave (d) Microscope - Compound light microscope (e) Centrifuge (f) pH meter	
UNIT-II	Principle, Construction and working of instruments	07 Hours
	(1) Colony counter (2) Colorimeter (3) Refrigerator (4) Inspisator (5) UV Spectrophotometer	
UNIT-III	Pure culture techniques	8 Hours
	(1) Definitions: pure culture, axenic culture	02 Hours
	(2) Methods of isolation of microorganisms in pure culture: principles, use of physical, chemical and biological selection methods. Characteristics of pure culture	02 Hours
	(3) Preservation and maintenance of pure culture : subculturing, low temperature preservation, lyophilisation, use of liquid nitrogen.	
	(4) Culture collection centres - their objectives and functions.	02 Hours
	(5) Cultivation methods: cultivation of anaerobic organisms, by use of living tissues, pre-reduced media, anaerobic jar and anaerobic chamber	02 Hours

UNIT-IV Stain and staining techniques

6 Hours

- (i) Stains and staining techniques (Dyes, stain, mordants, intensifier)
- (ii) Microscopic observations of microorganisms by (i) monochrome staining (simple staining, Negative staining)

*

Reference books

- (1) Elementary Microbiology (Vol-I)
Fundamentals of microbiology
Dr. H.A.Modi; (Aug 1995)
AKTA Prakashan, Nadiyad-387001
- (2) Microbiology
Michael J.PelczarJR., E.C.S.Chan;
Noel R.Krieeg (5th edition-1993
Tata McGraw-Hill edition 1993
- (3) Experimental microbiology (Vol-1)
Rakesh J. Patel, Kiran R. Patel (2000)
Aditya Prakashan, Ahmedabad
- (4) Introductory microbiology
Purshottam kaushik (1996)
Emkay publications, Delhi

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
MIC-202: Basic techniques in Microbiology
(Syllabus of PRACTICAL portion)
Total Mark: 25= External Evaluation: 20 Marks +
Internal Evaluation: 05Marks)
(Total Teaching Hours=45, Credit=02)

- 1 Gram staining
- 2 Disposal of lab. Waste and culture
- 3 Use of oculars stage micrometer

GUJARAT VIDYAPEETH : AHMEDABAD

M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar

Department of Microbiology

Semester-II

(In Force from June-2010)

CHEM-201: Inorganic Chemistry

(Syllabus of theoretical portion) (In force from June, 2010)

Total Mark: 50= External Evaluation: 40 Marks +

Internal Evaluation: 10Marks)

(Total Teaching Hours=30, Credit=02)

Unit-1: Coordination Compounds

(20 Marks) (15 Hours)

- 1.1 Double salts and Coordination compounds **(2hours)**
- 1.2 Werner's work **(2hours)**
- 1.3 Types of ligands **(1.5hours)**
- 1.4 Chelate compound **(0.5 hour)**
- 1.5 Isomerism of coordination compounds **(3hours)**
 - Geometrical isomerism
 - Optical isomerism
 - Ionization isomerism
 - Linkage isomerism
 - Coordination isomerism
- 1.5 Stability of coordination compounds **(2hours)**
 - Stepwise and overall formation constants
- 1.6 Bonding in coordination compounds **(2hours)**
 - Crystal Field Theory
- 1.7 Applications of coordination compounds **(2hours)**

References

1. Basic Inorganic Chemistry (Third edition), F. Albert cotton, Geoffrey Wilkinson and Paul L.Gaus., John Wiley and Sons, Inc., New York., pp.165-185 (1995) .
2. Concise Inorganic Chemistry (Fifth edition), J.D.Lee., Blackwell Science Ltd., Oxford., pp.194-236(1996) .

Unit-2: Covalent Bonding and Molecular Orbitals

(20 Marks) (15 Hours)

- 2.1 Introduction **(1hour)**
- 2.2 Sidgwick-Powell theory **(1hour)**
- 2.3 Valence Shell Electron Pair Repulsion (VSEPR) theory **(1hour)**

2.4 Some examples using the VSEPR theory **(2hours)**

- BeCl₂
- BF₃
- NH₃
- H₂O
- PCl₅
- SF₆
- IF₇

2.5 Sigma and pi bonds **(0.5 hour)**

2.6 Molecular orbital method **(0.5hour)**

2.7 Linear combination of Atomic Orbitals (LCAO) method **(2hours)**

- s-s combinations of orbitals
- s-p combinations of orbitals
- p-p combinations of orbitals
- p-d combinations of orbitals
- d-d combinations of orbitals
- Nonbonding combinations of orbitals

2.8 Rules for Linear combination of Atomic Orbitals**(1hour)**

2.9 Examples of molecular orbital treatment for homonuclear diatomic molecules **(4hours)**

- H₂⁺ molecule ion
- H₂ molecule
- He₂⁺ molecule ion
- He₂ molecule
- Li₂ molecule
- Be₂ molecule
- B₂ molecule
- C₂ molecule
- N₂ molecule
- O₂ molecule
- O₂⁻ molecule ion
- O₂²⁻ molecule
- F₂ molecule

2.10 Examples of molecular orbital treatment for heteronuclear diatomic molecules **(2hours)**

- NO molecule
- CO molecule
- HCl molecule

References

1. Basic Inorganic Chemistry (Third edition), F.Albert cotton, Geoffrey Wilkinson and Paul L.Gaus., John Wiley and Sons,Inc.,New York., pp.73-124 (1995) .
2. Concise Inorganic Chemistry (Fifth edition), J.D.Lee., Blackwell Science Ltd.,Oxford., pp.-72-110(1996) .

-----xxx-----xxx-----xxx-----

GUJARAT VIDYAPEETH : AHMEDABAD

M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar

Department of Microbiology

Semester-II

(In Force from June-2010)

CHEM-201: Inorganic Chemistry

(Syllabus of PRACTICAL portion) (In force from June, 2010)

Total Mark: 25= External Evaluation: 20 Marks +

Internal Evaluation: 2Marks)

(Total Teaching Hours=45, Credit=02)

(A) Qualitative analysis of inorganic mixture (45 hours)

Semi-micro method of analysis of mixture of powders containing four radicals excluding soluble PO_4^{3-} , arsenite, arsenate and borate. Mixture may be partly soluble in water and wholly soluble in an acid

Candidate should perform the analysis of following ions

Na^+ , K^+ , NH_4^+ , Mg^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Fe^{2+} , Fe^{3+} , Al^{3+} , Cr^{3+} , Zn^{2+} , Mn^{2+} , Co^{2+} , Hg^{2+} , Pb^{2+} , Cu^{2+} , Sn^{2+} , Ag^+ and S^{2-} , SO_3^{2-} , SO_4^{2-} , CO_3^{2-} , Cl^- , Br^- , I^- , NO_3^- , NO_2^-

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
PHY-201: Physics-II
(Syllabus of theoretical portion) (In force from June, 2010)
Total Mark: 50= External Evaluation: 40 Marks +
(Internal Evaluation: 10 Marks)
(Total Teaching Hours=30, Credit=02)

Unit: 1 Optics

7 hrs

(A) Lenses

- Defect of lenses & solutions:
 Suberical aberration, Chromic aberration
- Defect in human eyes with solutions
- Total internal reflection
- Optical fiber & its uses

(B) Interference

- Coherence
- Interference of wave from several coherent sources
- Direction transmission & reception of radio signals
- Interference by division of amplitude
- Thin films
- Newton's rings

(C) Electromagnetic Waves

- Spectrum of E M waves
- Types of Spectrum

Ref: (1) Optics and Atomic Physics by Khandeval, Himalaya Publishing.
(2) A text book of Optics by Subrahmanyam & Brijlal. S. Chand.

Unit: 2 Solid State Physics and Nuclear Physics

8 hrs

(A) Solid State Physics

Crystal Structure:

- Atomic Properties
- Electronic Properties
- Crystal Lattice
- Primitive Unit
- Types of Lattice
- Miller Indices

Crystal Diffraction:

- Method of diffraction due to crystal (i) X-rays (ii) Neutron (iii) Electron
- Bragg's law

(B) Nuclear Physics

- α -rays, β -rays, γ -rays
- Quarks
- Geiger Muller Counter

Ref: (1) Solid State Physics by Saxena, Pragati Prakashan.
(2) Introduction to Solid State Physics by C. Kittel (7th edition)
(3) Nuclear Physics by S. B. Patel.

Unit: 3 Ultrasonics and X-rays

7 hrs

(A) Ultrasonics

- Intensity of sound & Ultrasonic waves
- Intensity level – loudness
- Sensitivity of normal human ear
- Quality & Pitch
- Ultrasonic Waves
- To Produce Ultrasonic waves – Piezo electric method
- Uses of Ultrasonic waves

(B) X-Rays

- Uses of X-rays
- Characteristics & uses of Positive rays
- Beta Ray Spectrometer

Ref: University Physics by Sears Zeemansky & Young Narosa Publication House

Unit: 4 Thermodynamics**8 hrs**

- Carnot theorem
- Thermodynamics' laws (definition only)
- Kelvin temperature
- Clausius equation
- Phase diagram, triple point
- Thermal Conductivity
- Diffusion Phenomenon
- Comparison of living & non living system

Ref: University physics & Heat and thermodynamics by Zeemansky.

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
PHY-201: Physics-II
(Syllabus of Practical portion) (In force from June, 2010)
Total Mark: 25= External Evaluation: 20 Marks +
Internal Evaluation: 05 Marks)
(Total Teaching Hours=45, Credit=02)

1. X-ray diffraction pattern
2. Electromagnetic spectrum
3. Newton's ring
4. λ by plane diffraction grating
5. Meld's experiment
6. Analysis of error
7. Chauchi's constant
8. Refractive index of prism
9. Cardinal points
10. Thermocouple

GUJARAT VIDYAPEETH : AHMEDABAD
Department of Microbiology
M.D. Gramseva Mahavidyalaya, Sadra, Dist. Gandhinagar
Semester-II
(In force from December-2010)

Paper No:- ENG -201

Paper Name:- English

(Syllabus of theoretical portion)

Total Marks: 50 (External evaluation : 40 marks)
(Internal evaluation : 10 marks)

Credit :- 2

Time duration:- 30 hours/Paper/Semester

Unit-1 Text (40%)

Singing Rivers and Speaking Stones, an anthology of Prose and Poetry.

Edited by

Shanta Rarneshwar Rao, Published by Orient Longman, 2005 edition.

(Only prose section to be taught)

Rest of the lessons from the prose sections of the text.

- 1) The Night the policemen came.
- 2) The story of Balder
- 3) Not just Oranges
- 4) A different kind of Learning

Unit-2 Vocabulary (10%)

- 1) Match the words with their correct meanings.
- 2) Make meaningful sentences by using the words.

Unit-3 Grammar (30%)

- 1) Nouns (classes and gender, Number and case)
- 2) Adjectives
- 3) Pronouns
(Personal, reflexive, emphatic, interrogative, distributive, reciprocal and relative)

Reference Book for Grammar:

Intermediate grammar, usage and composition, Author: M.L. Tickoo, A.E. Subramaniam and P.R. Subramaniam, 2005 edition, published by Orient Longman, New Delhi.

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
EC-201: Biofertilizers
(Syllabus of theoretical portion) (In force from June, 2010)
Total Mark: 50= External Evaluation: 40 Marks +
Internal Evaluation: 10Marks)
(Total Teaching Hours=30, Credit=02)

UNIT:- I	Hours
(1) Biofertilizers-Introduction - Nitrogen fixers, phosphate solubilizers, - Nutrient translocators, organic matter decomposers, growth accelerators	04 hrs
(2) Biofertilizers-Marketting and prospects for commercialization	04 hrs
(3) Potential demand and current status of biofertilizer production in India	04 hrs
(4) Microbiological techniques - Staining of microorganisms - motility of bacterial cells	04 hrs
UNIT:- 2	hours
(5) Production technology	2 hrs
- Isolation of Rhizobium from nodules	2 hrs
- Isolation of culturing of of Azotobactoe	2 hrs
- Isolation of culturing of of Azospirillum	2 hrs
- Isolation of culturing of of Acetobacter	2 hrs
- Isolation of culturing of of phosphate Solubirizing bacteria	
(6) Mass Production of bacterial biofertilizers	2 hrs
(7) Quality control of biofertilizers	2 hrs
(8) Field applications of biofertilizers	1 hr
	Total 15 hrs
(1) Dr. M.S. Vora, H.N.Shelat & Dr. R.V. Vyas An introduction to biofertilizers and biopesticides, B.A. College of Agriculture, Anand Agriculture University- Anand (Gujarat) 388110	
(2) Subbarao N.S.	
(3) Biofertilizers & Organic Farming Vyas and H.A.modi	

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II

(In Force from June-2010)

EC-202: Biological important inorganic and organic compounds
(Syllabus of theoretical portion) (In force from June, 2010)

Total Mark: 50= External Evaluation: 40 Marks +

Internal Evaluation: 10Marks)

(Total Teaching Hours=30, Credit=02)

Unit:1

Hours

1) Classes and functions of inorganic compounds	01 hour
2) Oxidation – Reduction reactions	01 hour
3) Formulation of organic molecules	01 hour
4) Functional groups	01 hour
5) Major Functional groups found in microorganisms	01 hour
6) Optical isomers	01 hour

Unit II

1) Biologically important organic macromolecules Carbohydrates	05 hours
2) Proteins	05 hours
3) Lipids	04 hours
4) Nucleic acids	05 hours
5) Adenosine Triphosphate	05 hours

Reference book

(1) Elementary Microbiology (Vol-I)
Fundamentals of microbiology)
Dr. H.A.Modi; (Aug 1995)
AKTA Prakashan, Nadiyad-387001

(2) Biochemistry: Lehninger

GUJARAT VIDYAPEETH : AHMEDABAD
M.D. Gramseva Mahavidyalaya, Sadra, Dist: Gandhinagar
Department of Microbiology
Semester-II
(In Force from June-2010)
EC-203: Present state of bacterial taxonomy
(Syllabus of theoretical portion) (In force from June, 2010)
Total Mark: 50= External Evaluation: 40 Marks +
Internal Evaluation: 10Marks)
(Total Teaching Hours=30, Credit=02)

Unit:1

Volume : 1	Hours	07
Volume : 2	Hours	08

Unit: II

Volume : 3	Hours	07
Volume : 4	Hours	08
	Total	30

Reference book

(1) Bergey's Manual on Systematic Bacteriology.

મ.દે.ગ્રામસેવા મહાવિદ્યાલય
સૂક્ષ્મજીવાણુવિજ્ઞાન વિભાગ, સાદરા. તા.જી.ગાંધીનગર.

FC-201-પર્યાવરણ શિક્ષણ

સેમેસ્ટર: 2

(જૂન-2010થી અમલી, સેમેસ્ટર સિસ્ટમ આધારિત અભ્યાસક્રમ)

કુલ કલાક:	30/ સેમેસ્ટર (સૈદ્ધાંતિક)
	45/ સેમેસ્ટર (પ્રાયોગિક)
કુલ ગુણ :	50/ (સૈદ્ધાંતિક)
	25/ (પ્રાયોગિક)
કેડિટ :	02 (સૈદ્ધાંતિક)
	02 (પ્રાયોગિક)

એકમ : 1 પર્યાવરણમાં જૈવિક વિવિધતાનો પરિચય (10 કલાક)

- (1.1) જૈવિક વિવિધતા એટલે શું? વ્યાખ્યા અને સમજ
- (1.2) જૈવિક વિવિધતાના પ્રકારો
- (1.3) જૈવિક વિવિધતાનું મહત્ત્વ

એકમ : 2 કુદરતી સ્ત્રોતો: જમીન અને જંગલો (10 કલાક)

- (2.1) ભૂમિ એટલે શું? તેના પ્રકાર
- (2.2) ભૂમિ(જમીન)નું નિર્માણ અને તેના પ્રકાર
- (2.3) સંશોધન તરીકે તેનું મહત્ત્વ
- (2.4) ભૂમિ પ્રદુષણ અને નિયંત્રણ
- (2.5) જંગલોનું મહત્ત્વ
- (2.6) જંગલ વિનાશનાં કારણો; તે નિવારવાના ઉપાયો.

એકમ : 3 ઊર્જા

(10 કલાક)

- (3.1) ઊર્જાના વિવિધ ઉપયોગ અને ઇતિહાસ
- (3.2) ઊર્જા એટલે શું ? તેના વિવિધ સ્ત્રોત, તેનું વર્ગીકરણ
- (3.3) અખૂટ અને ખૂટી જાય તેવાં ઊર્જાસ્ત્રોતના તફાવત
- (3.4) બિનપરંપરાગત ઊર્જાનાં સાધનો, ટેકનોલાજીનો વિકાસ

નોંધ: પ્રાયોગિક કાર્ય ફિલ્ડવર્ક/ પ્રોજેક્ટ કાર્યના સ્વરૂપે હાથ ધરવાનું રહેશે.