Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY
University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
Tel : +91 - 261 - 2227141 to 2227146, Toll Free : 1800 2333 011, Digital Helpline No.- 0261 2388888
E-mail : info@vnsgu.ac.in, Website : www.vnsgu.ac.in

સંદર્ભ: યુનિવર્સિટી કાર્યાલયના તા.૦૪–૦૭–૨૦૨૩, ક્રમાંક : એસ./સાયન્સ/પરિપત્ર/૧૬૨૩૪/૨૦૨૩

–: પરિપત્ર :–

વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૩–૨૪ થી અમલમાં આવનાર શિક્ષણ વિભાગના રાજયની તમામ ઉચ્ચ શૈક્ષણિક સંસ્થાઓ માટે રાષ્ટ્રીય શિક્ષણ નીતિ ૨૦૨૦ અંતર્ગત કોમન કરીકયુલમ એન્ડ ક્રેડિટ ફ્રેમવર્ક હેઠળ ક્રેડિટ માળખું અમલીકરણ માટે નિયત કરવા બાબત અંગેના તા.૧૧/૦૭/૨૦૨૩, ઠરાવ ક્રમાંકઃ KCG/admin/2023-24/0607/kh.1 અનુસાર તથા વિજ્ઞાન વિદ્યાશાખાનાં સ્ટ્રકચર મુજબ શૈક્ષણિક વર્ષ ૨૦૨૩–૨૪ થી અમલમાં આવનાર B.Sc. Botany Sem-1 & 2 નો Major, Minor, Multidisciplinary અને SEC નો અભ્યાસક્રમ બોટની વિષયની અભ્યાસ સમિતિ વતી અભ્યાસ સમિતિનાં ચેરમેનશ્રીએ અને વિજ્ઞાન વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિજ્ઞાન વિદ્યાશાખા વતી વિજ્ઞાન વિદ્યાશાખાનાં અધ્યક્ષશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૧૭/૦૮/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંકઃ૧૧ થી મંજૂર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૧૭/૦૮/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંકઃ૧૧

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૩–૨૪ થી અમલમાં આવનાર B.Sc. Botany Sem-1 & 2 નો Major, Minor, Multidisciplinary અને SEC નો અભ્યાસક્રમ બોટની વિષયની અભ્યાસ સમિતિ વતી અભ્યાસ સમિતિનાં ચેરમેનશ્રીએ અને વિજ્ઞાન વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિજ્ઞાન વિદ્યાશાખા વતી વિજ્ઞાન વિદ્યાશાખાનાં અધ્યક્ષશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણનો સ્વીકાર કરી મંજૂર કરવામાં આવે છે.

(બિડાણઃ ઉપર મુજબ)

ક્રમાંક : એસ./સાયન્સ/પરિપત્ર/૨૧૫૫૨/૨૦૨૩
તા.૧૮–૦૮–૨૦૨૩

કુલસચિવ વતી

પ્રતિ,
૧) વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ.
..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારૂ.
૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....તરફ જાણ તેમજ અમલ સારૂ.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Course Coding Pattern for Three/Four Years UG Degree (Honours) Semester-I

FRAMED ACCORDING TO

NATIONAL EDUCATION POLICY (NEP) 2020 (Effective from June 2023)

FOR

BOTANY

Course Coding Pattern for Three/Four Years UG Degree (Honours) Semester-I

Semester	Major(MJ)		Minor(ME)		Multi disciplinary (MDC)	AEC	SEC	VAC	Internship	Total Credits
	Theory	Practical	Theory	Practical	T/(T+P)	——	T/P/ (T+P)	——	———	——
I	3+3	1+1	2	2	4/(2+2)	2	2/2/ (1+1)	2	-------	22

[AEC: Ability Enhancement Course; SEC: Skill Enhancement Course; VAC: Value Added Course]

Semester I [Major (MJ)]

Course Code	Course Title	Teaching Schedule Hours /Week	Credits
BO-MJ-101	BIODIVERSITY (MICROBES, ALGAE, FUNGI & ARCHEGONIATE)	3	3
BO-MJ-102	BIOLOGY AND DIVERSITY OF SEED PLANTS	3	3
BOP-MJ-1	PRACTICAL	4	1+1
TOTAL CREDITS			8

Semester I [Minor (ME)] DOMAIN SPECIFIC/ ELECTIVE

Course Code	Course Title	Teaching Schedule Hours /Week	Credits
BO-ME-101	PLANT ECOLOGY & TAXONOMY	2	2
BOP-ME-1	PRACTICAL	4	2
TOTAL CREDITS			4

Semester I [Multidisciplinary (MDC)]

Course Code	Course Title	Teaching Schedule Hours /Week	Credits
BO-MDC-101	Environmental Science	2	2
BOP-MDC-1	PRACTICAL	4	2
TOTAL CREDITS			4

Semester I [Skill Enhancement Course(SEC)]

Course Code	Course Title	Teaching Schedule Hours /Week	Credits
BO-SEC-101	Natural Resources and Biodiversity **OR** Plant Diversity and Human Welfare	2	2
TOTAL CREDITS			2

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
SYLLABUS FOR B.Sc. SEMESTER - I
FRAMED ACCORDING TO
NATIONAL EDUCATION POLICY (NEP) 2020 (Effective from June 2023)
BO-MJ-101
BOTANY (Major) PAPER – 101

BO-MJ-101 BIODIVERSITY(MICROBES, ALGAE, FUNGI & ARCHEGONIATE) (3 credits)

BO-MJ-101	BIODIVERSITY(MICROBES, ALGAE, FUNGI & ARCHEGONIATE)	45 hours
UNIT 1	MICROBES	15 Hours
	➢ Acellular forms of life: ➢ Viruses: ➢ General characters, structure, size. ➢ Virus types based on genetic material, Viriods, Virions & Prions ➢ TMV and Bacteriophages-T4. ➢ Economic Importance of Viruses. ➢ Cellular forms of Life: ➢ Prokaryotes ➢ Bacteria: structure and reproduction, Gram Staining ➢ Types & shapes of Bacteria, ➢ Economic and Ecological Importance of Bacteria	
UNIT 2	ALGAE & FUNGI	15 Hours
	ALGAE ➢ Classification of algae by G.M. Smith ➢ Economic and Ecological Importance of Algae ➢ Classification, Occurrence, Thallus structure and reproduction of: *Nostoc, Spirogyra* FUNGI ➢ Classification of fungi by Alexopolus ➢ Economic and Ecological importance of fungi ➢ Classification, Occurrence, vegetative structure and reproduction of following : ➢ *Mucor, Agaricus*	

UNIT 3	ARCHEGONIATE	15 hours
	BRYOPHYTES • Distinguishing Characters of Bryophytes , • Typical Life cycle of Bryophytes with special reference to Gametophyte and Sporophyte generation, • Classification, Occurrence, Gametophytic and sporophytic stages (excluding developmental stages) of the following genera: *Marchantia, Funaria* • Economic and Ecological importance of Bryophytes **PTERIDOPHYTES** • Distinguishing Characters of Pteridophytes • Typical Life cycle of Pteridophytes with special reference to Gametophyte and Sporophyte generation • Classification, Occurrence and Gametophytic and sporophytic stages (excluding developmental stages) of the following genera: *Nephrolepis* • Economic and Ecological importance of Pteridophytes	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

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BO-MJ-102

BOTANY (Major) PAPER - 102

BO-MJ-102: **BIOLOGY AND DIVERSITY OF SEED PLANTS** **(3 credits)**

BO-MJ-102:	**BIOLOGY AND DIVERSITY OF SEED PLANTS**	**45 Hours**
UNIT 1	BIOLOGY OF SEED PLANTS	20 Hours
	➢ General and distinguishing characters of Seed plants ➢ Root System, parts of root, its Modification & Function ➢ Stem System, types of stems, its Modification and functions ➢ Leaf: Structure and types, forms (shape & Margin) Types of venation,	
UNIT 2	GYMNOSPERMS	10 Hours
	• Distinguishing characters of Gymnosperms. • Classification, Occurrence and Gametophytic and Sporophytic stages (excluding developmental stages) of the following genera: *Cycas* • Economic and Ecological importance of Gymnosperms	
UNIT 3	ANGIOSPERMS	15 Hours
	Types of stipules, Phyllotaxy, Modification & functions • Bracts – types • Aestivation Inflorescence Types: a. Racemose –Raceme, Spike, Spadix, Corymb, Umbel, Catkin and Capitulum b. Cymose-Solitary, Monochasial-Helicoid and Scorpoid; Dichasial and Polychasial c. Special types - Verticillaster, Cyathium and Hypanthodium Flower: a. Parts of a typical flower: Bract, Pedicel, Thalamus-forms, Perianth-Calyx and Corolla, Androecium & Gynoecium b. Symmetry: Actinomorphic and Zygomorphic, Sexuality-Unisexual and Bisexual, Insertion of Floral whorls on thalamus-Hypogyny, Epigyny and Perigyny, Merous Condition-Trimerous, tetramerous and Pentamerous. c. Placentation: Types with examples. d. Classification as per Bentham & Hooker's system, general characters and floral formula, Botanical name of very common plants of the following families.Malvaceae, Rubiaceae, Apocynaceae, Amaryllidaceae.	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

SYLLABUS FOR B.Sc. SEMESTER - I

FRAMED ACCORDING TO

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BOP-MJ-1

BOTANY (Major) PRACTICAL – 1

BOP-MJ-1:	BASED ON BO-MJ-101 & BO-MJ-102: BIODIVERSITY(MICROBES, ALGAE, FUNGI & ARCHEGONIATE) & BIOLOGY AND DIVERSITY OF SEED PLANTS	2 credits

- The candidates should study their environment and the typical vegetation in natural condition and should record their observation in journals.
- Excursion should be arranged during the year to local places.
- Every candidate shall complete laboratory course in accordance with the regulations issued from time to time by Academic Council on the recommendation of the Board of Studies.
- Every candidate shall record observation directly in the laboratory journal. Every journal shall be signed periodically.
- At the end of the semester candidate shall produce certified journal during the practical examination.

PART A –MICROBES, ALGAE & FUNGI: (15 Hours)

1. To study gram staining technique using available bacterial samples (Curd/Root Nodules/Pure Culture)
2. To study structure of TMV Bacteriophage using Chart
3. To study thallus structure in *Nostoc.*
4. To study the thallus structure, Scalariform conjugation and lateral conjugation in *Spirogyra.*
5. To study vegetative structure and Sporangia of *Mucor.*
6. To study structure and V.S. Basidiocarp in *Agaricus*.

PART B-ARCHEGONIATE: (15 hours)

7. To st*udy exte*rnal features of Gametophyte & Sporophyte, Anatomy of *Marchantia* using fresh or preserved specimens and permanent slides.
8. To study external features of Gametophyte & Sporophyte, Anatomy of *Funaria* using fresh or preserved specimens and permanent slides.
9. Study of morphology of Sporophyte of *Nephrolepis* using fresh or preserved specimens
10. Preparation of slides from the fresh/preserved material of Stolon (T.S.) of *Nephrolepis.*
11. Preparation of slides from the fresh/preserved material of leaflet passing through sori of *Nephrolepis.*
12. Preparation of slides from the fresh/preserved material of Rachis (T.S.) of *Nephrolepis.*

PART C-SEED PLANT: (15 hours)

13. To study different:
    a. types of roots:
        - Tap roots (*Vinca*), Fibrous Roots (Grass), Adventitious (Sugarcane),
    b. Modified roots:
        - Prop roots (Banyan tree), Stilt root (Maize), Pneumatophores (Avicennia), Storage roots (Carrot, Sweet Potato).
14. To study different types of stem:
    a. Aerial Stems- Caudex-Palms, Clums (Bamboo), Scape (Canna and Onions), Excurrent (*Polyalthia longifolia, Casuarina*), Deliquescent (Mango), Weak Stem (*Ipomoea*
    b. Underground Stems:
        - Rhizome-(Ginger, turmeric), Tuber (Potato), Bulb (Onion), Corm (*Amorphophallus*).
    c. Specialized Stem:
        - Phylloclade (*Opuntia*), Cladode (*Asparagus*).
15. To study different types of leaf: (any of the type as per availability)
    a. Simple (Mango & Banana),
    b. Pinnate Compound Leaf-
        i. Unipinnate (Cassia, Rose),
        ii. Bipinnate –*Mimosa, Caesalpinia*
        iii. Tripinnate *(Moringa)*
        iv. Decompound (*Coriander*)
    c. Palmately Compound Leaf-
        i. Unifoliate (*Citrus*),
        ii. Bifoliate (Balanites, Bauhinia),
        iii. Trifoliate (*Crotalaria, Oxalis*),
        iv. Quadrifoliate (*Marsilea*), Mutlifoliate (*Bombax*)
16. To study phyllotaxy of the following type:
    - Alternate: *Hibiscus*
    - Opposite Superpose: *Quisqualis indica*
    - Opposite Decussate: *Calotropis*
    - Verticillate or Whorled: *Ocimum*
17. To study Flower: (any of the type as per availability)
    - Regular Flower-*Ipomoea*

- Irregular Flower-*Clitoria, Caesalpinia*
- Unisexual Flower-*Coccinia*
- Bisexual Flower-*Hibiscus*

18. To study type inflorescence of the following:

A. Racemose:

a. Raceme: Caesalpinia pulcherrima, Brassica juncea
b. Spike: *Achyranthes aspera, Polianthes tuberosa*
c. Spadix: *Colocasia*
d. Catkin: *Acalphya hispida*
e. Corymb: *Cassia, Ixora*
f. Umbel: *Coriandrum*
g. Capitate: *Acacia, Albizzia*
h. Capitulum: *Helianthus, Tridax*

B. Cymose:

- Unbranched
  a. Solitary Terminal: *Datura*
  b. Solitary Axillary: *Hibiscus*
- Branched
  a. Helicoid: *Hemellia patens*
  b. Scorpoid: *Heliotropium*
  c. Dichasial or Biparous: *Clerodendrum, Nyctanthes, Jasminum*
  d. Polychasial or Multipaorus: *Nerium, Calotropis*

19. To study the following placentation types:

Marginal, Axile, Free central, Parital, Basal, Superficial.

PART D (15 hours)

20. To study fresh/preserved specimen of *Cycas* coralloid roots,
21. To study fresh/preserved specimen of *Cycas* Megasporophyll
22. To study fresh/preserved specimen of *Cycas* Microsporophyll.
23. To study fresh/preserved specimen of *Cycas* Rachis.
24. Preparation of slides from fresh or preserved specimen material of *Cycas* leaflet
25. Study of morphological characters, floral dissection, T.S ovary, and floral formula of Malvaceae family.
26. Study of morphological characters, floral dissection, T.S ovary, and floral formula of Convolvulaceae family.
27. Study of morphological characters, floral dissection, T.S ovary, and floral formula of Nyctanginaceae family.
28. Study of morphological characters, floral dissection, T.S ovary, and floral formula of Amaryllidaceae family.

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4. Cryptogamic Botany Vol. I - II G.M.Smith 2nd Edi. 1955 Tata MCGrow Hill Bombay

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6. A text book of Botany vol. I (Algae, Fungi, Bacteria, Viruses, Lichen & Plant pathology) Pandey etal. - Vikash publishing House pvt. Ltd., New Delhi

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8. The fungi, bacteria and viruses by Lokendra Singh; Rastogi Publications

9. A Brief Course in Algae K.P.Saxena 1965 Prakashan Kendra, Lucknow.

10. Introduction to Fungi S.Sundara Rajan 1st Edi. 2001 Anmol Publication, New Delhi

11. Botany for Degree Student- P.C. Vashishta 1st Edi.

12. Modern Practical Botany Vol. II B.P. Pandey 1995 S. Chand & Company, New delhi.

13. Taxonomy of Angiosperms V. Singh 1st Edi. 1981 Rastogi pub.

14. A Text Book of Practical Botany Vol. I & II by Bendre & Kumar, Rastogi Publication.

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17. A text book of Botany: The Algae by Brahma Prakash Pandey; Jai Prakash Nath and Co.

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19. A text book on Algae by H.D. Kumar and H.S. Singh; East-west press.

20. Fungi, Bacteria and Viruses by H.C. Dube; Vikas publishing house

21. Pandey B P 2011. College Botany (Vol. 3). S. Chand & Co. Ltd, New Delhi, India

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26. Botany [for degree students] Bryophyta by B.R. vashishta; S.Chand and Co.

27. Botany for degree students: Pteridophyta by P. C. Vasishta; S. Chand and Co (Pvt.) Ltd.

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30. Vansptishaastra J.V.Joshi & H.K.Patel 4th edi. 2002 Popular prakashan, Surat

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33. A Text Book of Botany (Semester I) Dr. T.G.Gohil and Dr. Alpesh B. Thakor 1st Edi. 2018 Popular prakashan, Surat

34. A Text Book of Botany (Semester II) Dr. T.G.Gohil and Dr. Alpesh B. Thakor 1st Edi. 2018 Popular prakashan, Surat

35. A Text Book of Practical Botany Vol. I & II by Bendre & Kumar, Rastogi Publication.

36. College Botany Practical Vo. I & II by Santra, Chatterjee & Das.

BO-ME-101 PLANT ECOLOGY & TAXONOMY **(2 credits)**

BO-ME-101	PLANT ECOLOGY & TAXONOMY	**30 hours**
UNIT 1	ECOLOGY & ECOSYSTEM	15 Hours
	➢ Abiotic factors (Climatic factors & Edaphic factors) ➢ Biotic factors ➢ Ecological adaptations (Morphological and anatomical) of: Hydrophytes, Mesophyte and Xerophytes. ➢ Concept and Types of Ecosystem ➢ Components of an Ecosystem ➢ Food chain & Food web ➢ Major ecosystems: Pond, Forest, Marine	
UNIT 2	TAXONOMY	15 hours
	➢ Classification System (Two Kingdom to Six Kingdom) ➢ Binomial Nomenclature ➢ Bentham and Hooker classification (till Series) ➢ Morphology of plants (Types of root, Parts of stem, Types of leaves, Phyllotaxy, Parts of Flower) ➢ Angiosperm Families: Classification as per Bentham & Hooker's system, general characters and floral formula, Botanical name of very common plants of the following families. Malvaceae, Apocynaceae, Nyctaginaceae, Amaryllidaceae. ➢ Herbarium technique	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

SYLLABUS FOR B.Sc. SEMESTER - I

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BOP-ME-1

BOTANY (Minor) PRACTICAL – 1

BOP-ME-1 BASED ON BO-ME-101: PLANT ECOLOGY & TAXONOMY (2 credits)

BOP-ME-1	BASED ON BO-ME-101: PLANT ECOLOGY & TAXONOMY	60 hours
	1. To determine the frequency of various species occurring in a given area 2. To determine the density of various species occurring in a given area 3. To determine the abundance of various species occurring in a given area 4. To study the morphological and anatomical characters of hydrophytes 5. To study the morphological and anatomical characters of xerophytes 6. To study the morphological and anatomical characters of halophytes 7. To study the morphological and anatomical characters of mesophytes 8. To study ecological instruments. 9. To determine water Holding Capacity 10. To determine moisture Percentage of the Soil. 11. To study types of root. (Tap root, Fibrous root, Adventitious root) 12. To study types of leaf. 13. To study types of venation. (Reticulate and Parallel venation) 14. To Stydy types of flower. (Regular, irregular, Unisexual, bisexual, hypogynous and epigynous flower. 15. To study Malvaceae family. 16. To study Apocynaceae family. 17. To study Nyctaginaceae family. 18. To study Amaryllidaceae family.	

REFERENCES:

1. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition

2. Shukla, R.S. and Chandel P.S. (2005) A text book of Plant Ecology. S. Chand and Company Ltd., Ram Nagar, New Delhi.

3. Odum, E.P. (2011) Fundamental of Ecology. 5th Edition. Saunders.

4. Odum, E.P. (1983) Basic Ecology Saunders, Philadelphia

5. Smith, R. and Smith, T.M. (2014) Elements of Ecology, 8th Edition. Pearson Education India

6. A text Book of Botany paper III Dr. T.G.Gohil and Dr. Alpesh B. Thakor 1st Edi. 2007 - 2008 Popular prakashan, Surat.

7. A text Book of Botany for S.Y.B.Sc. semester III students by Dr. T.G.Gohil and Dr. Alpesh B. Thakor Edi. 2019 Popular prakashan, Surat

8. Jaimin v Joshi (1998) Aavrut Bijadhari Vanspationu Vargikaran

9. Ashok Bendre, Practical botany (plant physiology, biochemistry, biotechnology, ecology and plant utilization), Rastogi Publication.

10. Taxonomy of Angiosperms V. Singh 1st Edi. 1981 Rastogi pub.

11. Modern Practical Botany Vol. II B.P. Pandey 1995 S. Chand & Company, New delhi.

BO-MDC-101	**Multidisciplinary Courses :** Environmental Science **(2 credits)**	**30 hours**
UNIT 1	**ENVIRONMENTAL BIOLOGY**	15 Hours
	➢ Environment and Environmental Biology: Definition, Scope, Basic Concepts and current issues of Environment. ➢ ABIOTIC and BIOTIC components of Environment and their effect on plants and humans. ➢ Environmental Pollution-Types, sources of Pollution, Classification of pollutants, measure of pollution, Effects of pollutants on the biodiversity. ➢ Global Warming, Acid Rain ➢ Bio-concentration and Bio/geomagnification.	
UNIT 2	**SOCIAL ISSUES AND ITS RELATION TO ENVIRONMENT**	15 Hours
	• ENVIRONMENTAL ISSUES & SOCIETY: o Narmada Bachao Andolan o Chipko Andolan, o Silent Valley Movement. o Women and Environmental Protection, o Family welfare, o Overpopulation, o Health issues. o Role of NGOs in bringing environmental awareness and education in society, Urbanization	

BOP-MDC-1	**Multidisciplinary Courses :** Environmental Science **(2 credits)**	60 hours
	1. To perform soil pH analysis 2. To perform soil water holding capacity. 3. To perform soil texture analysis. 4. To study soil moisture content in the given samples. 5. To assess aeromicroflora of a given environment. 6. To assess the phyllospheric microflora of a leaf surface. 7. To study the Soil thermometer as an Instrument used to measure ecological factors. 8. To study the RAIN GAUGE as an Instrument used to measure ecological factors. 9. To study the LUX METER as an Instrument used to measure ecological factors. 10. To study the HYGROMETER as an Instrument used to measure ecological factors. 11. To study the ANEMOMETER as an Instrument used to measure ecological factors. 12. To study the SOIL SECCHI DISK as an Instrument used to measure ecological factors. 13. To study the WET AND DRY THERMOMETER as an Instrument used to measure ecological factors. 14. To perform Total Dissoved Soilds (TDS) in the given sample. 15. To study pond ecosystem and its components (Plants, Algae, Phytoplanktons and Fauna). 16. To analyse living organisms in water samples. 17. To study grass/garden ecosystem (as per availability) and its components.	

REFERENCES:

1. P.D. Sharma. Ecology and Environmnt. Rastogi publications.
2. Environmental studies. Popular prakashan Surat.
3. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition
4. Shukla, R.S. and Chandel P.S. (2005) A text book of Plant Ecology. S. Chand and Company Ltd., Ram Nagar, New Delhi.
5. Odum, E.P. (2011) Fundamental of Ecology. 5th Edition. Saunders.
6. Odum, E.P. (1983) Basic Ecology Saunders, Philadelphi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

SYLLABUS FOR B.Sc. SEMESTER - I

FRAMED ACCORDING TO

NATIONAL EDUCATION POLICY (NEP) 2020 (Effective from June 2023)

Skill Enhancement Courses

BO-SEC-101 : Natural Resources and Biodiversity

BO-SEC-101	**Skill Enhancement Courses - Natural Resources and Biodiversity (2 credits)**	**30 hours**
UNIT 1	**NATURAL RESOURCES**	15 Hours
	➢ Introduction to natural resources ➢ Classification of natural resources ➢ Forest resources ➢ Water resources ➢ Mineral resources ➢ Food resources ➢ Energy resources ➢ Human and natural resources	
UNIT 2	**BIODIVERSITY CONCERNS**	15 Hours
	➢ General pattern of vegetation of Gujarat. ➢ Biodiversity and its types ➢ Conservation of biodiversity ➢ In-situ & Ex-situ conservation ➢ Biodiversity act ➢ Value of biodiversity ➢ Factors affecting threats to biodiversity ➢ Threats to Biodiversity in India ➢ Importance of biodiversity	

REFERENCES:

1. Environmental ecology, biodiversity and climate change, H.M. Saxena

2. Environmental science, Popular prakashan, surat

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Skill Enhancement Courses

BO-SEC-101 :Plant Diversity and Human Welfare

BO-SEC-101	**Skill Enhancement Courses** - Plant Diversity and Human Welfare **(2 credits)**	**30 hours**
UNIT 1	**PLANT DIVERSITY**	15 Hours
	➢ Plant Diversity and its scope-Genetic diversity, Species Diversity, Plant Diversity at the ecosystem level, Agrodiversity and cultivated plant taxa, wild taxa. ➢ Values and uses of Biodiversity: Ethical and Aesthetic Values, Precautionary Principles, Methodologies for valuation. ➢ Uses of plants and microbes in general.	
UNIT 2	**BIODIVERSITY**	15 Hours
	➢ Loss of genetic Biodiversity, Loss of species diversity, los of ecosystem diversity, loss of agro-biodiversity. ➢ Biodiversity Legislation and conservation, Biodiversity information management and communication. ➢ Conservation of genetic and species diversity, Conservation of ecosystem diversity. ➢ In situ and ex Situ conservation	

REFERENCES:

1. Krishnamurthy, K.V. 2004. An advanced text book of biodiversity-Principles and Practices. Oxford and IBH publications Co. Pvt. Ltd, New Delhi.
2. Environmental ecology, biodiversity and climate change, H.M. Saxena
3. Environmental science, Popular prakashan, surat.