



પરિપત્ર:

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટીની લાઈફ સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજોનાં આચાર્યશ્રીઓને સવિનય જણાવવાનું કે લાઈફ સાયન્સ વિદ્યાશાખા હેઠળનો NEP-૨૦૨૦ અંતર્ગત સ્કીલ એન્હાન્સમેન્ટ કોર્સનો સેમેસ્ટર-૫ નો અભ્યાસક્રમ આ સાથે સામેલ છે. આ બાસ્કેટમાં લાઈફ સાયન્સનાં વિષયો આપવામાં આવેલ છે.

માનનીય કુલપતિશ્રીની મંજૂરી અનુસાર સદર અભ્યાસક્રમ શૈક્ષણિક વર્ષ જુન, ૨૦૨૫ થી અમલવારી કરવાની રહે છે. લાઈફ સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજો દ્વારા તેની અમલવારી કરવા જણાવવામાં આવે છે.



[Signature]
12/6/2025

ખાસ ફરજ પરના અધિકારી
(એકેડેમિક)

ક્રમાંક/બીકેએનએમયુ/એકેડેમિક/૨૭૧/૨૦૨૫

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી,

સરકારી પોલીટેકનિક કેમ્પસ,

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી રોડ,

ખડીયા, જૂનાગઢ-૩૬૨૨૬૩

તા. ૧૨.૦૬.૨૦૨૫

પ્રતિ,

- ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી સંલગ્ન લાઈફ સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમો ચલાવતી તમામ કોલેજોના આચાર્યશ્રીઓ તરફ....

નકલ સાદર રવાના:-

- માન.કુલપતિશ્રી/કુલસચિવશ્રીનાં અંગત સચિવશ્રી.
- પરીક્ષા નિયામકશ્રી, ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી, જૂનાગઢ

નકલ રવાના જાણ તથા યોગ્ય કાર્યવાહી અર્થે:

- સીસ્ટમ મેનેજરશ્રી, આઈ.ટી.સેલ વિભાગ (વેબસાઇટ ઉપર પ્રસિદ્ધ થવા અર્થે.)



BHAKTA KAVI NARSINH MEHTA UNIVERSITY
JUNAGADH



BOARD OF STUDIES

FACULTY OF LIFE SCIENCES

BASKET FOR SKILL ENHANCEMENT COURSE

(SEMESTER- V)

EFFECTIVE FROM JUNE, 2025

BHAKTA KAVI NARSINH MEHTA UNIVERSITY
Skill Enhancement Course (SEC)
Syllabus for Faculty of Life Science as per NEP
Effective from June 2025
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2.	Vermiculture and Vermicomposting	05
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Course Level	U.G. (5.0)	Internal Marks	25
Programme	B.Sc. (Honors)	External Marks	25
Semester	5	Practical Internal	-
Course Type	SEC 5 (Theory)	Practical External	-
Course Credit	2T	Prac. Ext. Exam Time	-
Teaching Hours	30 hrs.	Total	50
Course Code		Exam Duration	1 hr
Course Title	NURSERY AND GARDENING		

Course Objectives:

- Understand nursery management, including objectives, planning, seed storage, and transplanting.
- Develop skills in vegetable cultivation, storage, and marketing of crops like cabbage, brinjal, and tomatoes.
- Learn gardening basics, including types, objectives, and landscape and home garden design.
- Practice gardening operations, such as soil preparation, manuring, watering, pest control, and harvesting.
- Apply plant propagation techniques like air-layering, cutting, hardening, and use of greenhouses and mist chambers.

Course Learning Outcomes: After completion of the course, the students will be able to:

- **Career Opportunities:** Roles in landscaping, garden maintenance, nursery management, or as a horticulturist.
- **Entrepreneurship:** Start your own plant nursery, landscaping business, or organic gardening venture.
- **Skill Development:** Gain expertise in plant care, soil management, pest control, and sustainable gardening.
- **Personal Use:** Enhance home gardening, kitchen gardens, or terrace farming.
- **Further Education:** Foundation for advanced studies in horticulture, botany, or agricultural sciences.

Pedagogy: Lectures/ Use of Multimedia / Assignments/ Hands-on experiments/ Demonstrations/ Field visit.

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Course Contents

Sem	Unit No.	Syllabus	Teaching Hours
5	1	NURSERY 1.1 Definition, objectives, scope and <i>plant propagation techniques</i> . 1.2 Planning and seasonal activities - Planting - direct seeding and transplant. 1.3 Seed storage: Seed banks, factors affecting seed viability. 1.4 Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures.	15
	2	GARDENING 2.1 Definition, objectives and scope - different types of gardening - <i>home gardening</i> . 2.2 Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting. 2.3 Air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings. 2.4 Hardening of plants - green house - mist chamber, shed root, shade house and glass house.	15

Suggested Reading:

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National _Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

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INTERNAL EVALUATION SCHEME		
NO	Particulars	Marks
1	Mid Semester Exam (Mandatory)	13
2	Class Test	03
3	Open book exam/test	03
4	Open note exam/test	03
5	Self-test/ Online test	03
6	Essay/Article writing	03
7	Quizzes/Objective test	03
8	Class assignment	03
9	Home assignment	03
10	Reports Writing	03
11	Research/Dissertation	03
12	Case Studies	03
13	Viva/Oral exam	03
14	Group Discussion	03
15	Role Play	03
16	Paper presentation/Seminar	03
17	Language Lab work	03
18	Interview	03
19	Craft work	03
20	Co-curricular work	03
21	Field Assignment	03
22	Poster Presentation	03
23	Attendance	03
24	Project Work	03
	Total	25

Note: Sr.No.1 is mandatory. Select any Four from Sr.No.2 to 24. Each Contains three marks. Student should secure 09 Marks for passing in internal Exam

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Paper Style

Ques. No.	Particulars	From which Unit	Marks
1 (A)	Describe in detail (Any One) (1) (2)	1	06
1 (B)	Write a Short Note (Any One) (1) (2)		04
2 (A)	Describe in detail (Any One) (1) (2)	2	06
2 (B)	Write a Short Note (Any One) (1) (2)		04
3	Do as Directed (Any Five from Seven) (1) (2) (3) (4) (5) (6) (7)	From 1 & 2	05
Total		25	

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Course Level	5.5	Internal Marks	25
Programme	B.Sc. (Honors)	External Marks	25
Semester	V	Practical Internal	-
Course Type	Skill Enhancement Course	Practical External	-
Course Credit	2	Prac. Ext. Exam Time	-
Teaching Hours	30	Total	50
Course Code		Exam Duration	1 Hrs.
Course Title	Vermiculture and Vermicomposting		

Course Objectives:

- To understand the fundamental principles and benefits of using earthworms for composting organic waste.
- To acquire basic skills in establishing and maintaining a simple vermicomposting system.
- To learn to identify suitable materials for vermicomposting and proper feeding techniques.
- To recognize the value and basic applications of vermicompost as a soil amendment.

Course Learning Outcomes: After completion of the course:

- Explain the process of vermicomposting and the role of earthworms in converting waste into a valuable resource.
- Set up a basic vermicomposting bin using locally available materials and suitable earthworms.
- Identify appropriate food waste for vermicomposting and describe proper feeding practices.
- Describe at least one key benefit and a basic application of using vermicompost to improve soil health.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	Vermiculture • Introduction and importance of vermiculture (waste reduction, soil health). • Suitable Indian Earthworm species for vermiculture • Methods of vermiculture (basic bin method and potential for small-scale pit). • Setting up a basic vermiculture bed/bin (bedding materials and initial setup). • Maintenance of vermiculture unit (feeding frequency and types, maintaining adequate moisture). • Harvesting worms for new beds/bins	15

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	2	Vermicomposting • The process of vermicomposting and role of earthworms. • Suitable organic wastes for vermicomposting. • Methods of vermicomposting (basic bin method and simple pit method for larger quantities). • Harvesting of vermicompost and vermiwash. • Uses and benefits of vermicompost and vermiwash • Factors affecting the rate of vermicomposting (moisture, aeration, food type - basic understanding).	15
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Suggested Reading:

1. Worms Eat My Garbage: How to Set Up and Maintain a Worm Composting System -- Mary Appelhof -- Flower Press
2. The Worm Book: The Complete Guide to Gardening and Composting with Worms -- Mary Appelhof -- Ten Speed Press
3. Let's Recycle with Worms -- Loretta Satterthwaite -- Gibbs Smith Publisher
4. Composting with Worms: The Down-to-Earth Guide to Vermiculture -- Kelly Slocum -- Cool Springs Press
5. The Complete Technology Book on Vermiculture and Vermicompost -- NPCS Board of Consultants and Engineers -- Asia Pacific Business Press Inc. (This book provides a comprehensive overview of the technology and processes involved.)
6. Vermicomposting for Sustainable Agriculture -- P.K. Gupta -- Agrobios
7. Vermitechnology -- M. Seetha Lekshmy, R. Santhi -- Saras Publication
8. Practical Manual Of Vermicomposting (Hindi) -- Singh Dharm -- Agrobios
9. Vermiculture -- Dr. Uma Shankar Mishra, Ashutosh Mishra -- Adhunik Prakashan Grih

INTERNAL EVALUATION SCHEME		
NO	Particulars	Marks
1	Mid Semester Exam (Mandatory)	13
2	Class Test	03
3	Open book exam/test	03
4	Open note exam/test	03
5	Self-test/ Online test	03
6	Essay/Article writing	03
7	Quizzes/Objective test	03
8	Class assignment	03
9	Home assignment	03
10	Reports Writing	03
11	Research/Dissertation	03
12	Case Studies	03

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13	Viva/Oral exam	03
14	Group Discussion	03
15	Role Play	03
16	Paper presentation/Seminar	03
17	Language Lab work	03
18	Interview	03
19	Craft work	03
20	Co-curricular work	03
21	Field Assignment	03
22	Poster Presentation	03
23	Attendance	03
24	Project Work	03
	Total	25

Note: Sr.No.1 is mandatory. Select any Four from Sr.No.2 to 24. Each Contains three marks. Student should secure 09 Marks for passing in internal Exam

Paper Style:

Ques. No.	Particulars	From which Unit	Marks
Que.1	Question 1 (1) (2)	1	05 05
	Or		
	Question 1 (1) (2)		05 05
Que.2	Question 2 (1) (2)	2	05 05
	Or		
	Question 2 (1) (2)		05 05
Que.2	Question 1	1 & 2	05
	Or		
	Question 2		
Total		25	

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Course Level	5.5	Internal Marks	-
Programme	B.Sc (Honours)	External Marks	25
Semester	V	Practical Internal	25
Course Type	Skill Enhancement Course-5	Practical External	-
Course Credit	02 (01T + 01P)	Prac. Ext. Exam Time	2 Hrs.
Teaching Hours	60 (30T+30P)	Total	50
Course Code	SECMBT501	Exam Duration	1 Hrs.
Course Title	Microbial Diagnostics and Public Health (Theory)		

Course Objectives:

- The main objective of the course is to improve the skills in the relevant domain and improve public health practices.

Course Learning Outcomes: After completion of the course:

- Have developed a very good understanding of practical aspects of the collection of different clinical samples, their transport, culture and examination by staining, and molecular and immunological diagnostic methods for the diagnosis of microbial diseases.
- Have developed a very good understanding of practical aspects of antibiotic sensitivity testing, water and food testing skills using kits available in the market.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	Importance of Diagnosis of Diseases: Bacterial, Viral, Fungal and Protozoan Diseases of various human body systems, Disease associated clinical samples for diagnosis.	7
	2	Collection of Clinical Samples: How to collect clinical samples (oral cavity, throat, skin, Blood, CSF, urine and faeces) and precautions required. Method of transport of clinical samples to laboratory and storage.	8
	3	Direct Microscopic Examination and Culture. Examination of sample by staining - Gram stain, Ziehl-Neelson staining for tuberculosis, Giemsa stained thin blood film for malaria. Preparation and use of culture media Blood agar, Chocolate agar, Lowenstein-Jensen medium, MacConkey agar, Distinct colony properties of various bacterial pathogens.	8

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	4	Testing for Antibiotic Sensitivity in Bacteria: Importance, Determination of resistance/sensitivity of bacteria using disc diffusion method, determination of minimal inhibitory concentration (MIC) of an antibiotic by serial double dilution method	7
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Suggested Reading:

1. Ananthanarayan R and Paniker CKJ. Textbook of Microbiology. 7th Edition. University Press Publication. (2005).
2. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-I, Aditya Publications, Ahmedabad, India.
3. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-II, Aditya Publications, Ahmedabad, India.

Suggested Practical (SEC-5)

Sr. No	Practical content	Teaching Hrs
1.	Collection and separation of serum from the blood sample	30
2.	Examination of the bacteria from the saliva	
3.	Preparation of MacConkey agar and inoculation of organisms	
4.	Perform the antibiotic sensitivity test	
5.	Perform the minimal inhibitory concentration (MIC)	

Suggested Reading:

1. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-I, Aditya Publications, Ahmedabad, India.
2. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-II, Aditya Publications, Ahmedabad, India.

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Paper Style:

Ques. No.	Particulars	From which Unit	Marks
Que.1	Question 1 (1) (2)	1 & 2	05 05
	Or		
	Question 1 (1) (2)		05 05
Que.2	Question 2 (1) (2)	3 & 4	05 05
	Or		
	Question 2 (1) (2)		05 05
Que.3	Question 1	From Any Unit	05
	Or		
	Question 2		
Total		25	

INTERNAL EVALUATION SCHEME		
INTERNAL ASSESSMENT		
No.	Particulars	Weightage
1	Internal test (Theory or practical)	13
2	Assignment/practical assignment	5
3	Field visit report/ class presentation	5
4	Attendance	2
	Total	25

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Course Level	5.5		Internal Marks	25
Programme	U.G.		External Marks	25
Semester	5		Practical Internal	-
Course Type	Skill Enhancement Course-5		Practical External	-
Course Credit	02		Prac.Ext.Exam Time	-
Teaching Hours	30		Total	50
Course Code			Exam Duration	1 Hour
Course Title	Writing Skills for Science Students			

Course Description:

- As science students have learnt grammar skills and conversational skills in the previous skill enhancement courses, this paper brings writing skills in focus. Science field has long history of record keeping and journalling in written mode.
- This paper is designed to hon writing skills of the students which can help them in further studies as well in future careers. This paper includes scientific, technical, comprehensive, creative and visual writing. The assessment pattern focuses on written pieces by students in the final examination.

Course Objectives:

- To expose students to various writing skills pertaining to science field.
- To acquaint students with various modes of writing.
- To develop independency in students for writing short pieces in English.
- To develop preparedness for current employment environment.

Course Learning Outcomes: After completion of the course:

- Students will be able to identify various writing skills pertaining to science field.
- Students will be able to comprehend various modes of writing.
- Students will be able to draft short pieces in English.
- Students will be able to tackle writing tasks prevalent in current employment environment.

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Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	1. Five-point summarization (Students will learn to write summary of a paragraph in five bullet points.) 2. Technical writing (Students will learn to write a short piece technically on a laboratory instrument or a process in given format.) 3. Scientific writing (Students will write a short piece of scientific writing using IMRaD format.)	20
	2	1. Reflective writing based on a thought (Students will learn to write paragraphs based on a thought or idea given to them using creative and analytical writing skills.) 2. Poster writing (Students will write a visual draft of poster based on given topics.)	10
List of prescribed topics for 1.2, 1.3, 2.1 & 2.2 has been given, examiners will select topics from the list for the above-mentioned writing skills.			

Suggested Reading:

1. Clark, Peter. *Writing Tools*. Litte, Brown Spark, 2008
2. Edwards, Julian. *Write Reflectively*. SAGE Publication, 2023
3. Paul, D. S. *Advanced Writing Skills*. Goodwill Publishing House, 2022
4. Gairns, Ruth. *Oxford Word Skills*. Oxford University Press, 2012

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List of prescribed topics:

Unit	Writing skill	Topics prescribed
1	Five-point summarization	An unseen paragraph will be asked
	Technical writing	• How to Use a Digital Thermometer • How to Use a Microscope • How to Clean Laboratory Glassware • How to Store Chemicals Safely in a Lab • How to Prepare a Slide for Microscopic Observation (Format of technical writing will include Title, Objectives, Materials needed or Steps of procedure.)
	Scientific writing	• Effect of Temperature on Dissolving Sugar • How Light Affects Plant Growth • Effect of Salt on Boiling Point of Water • Simple Pendulum: Measuring Time Period • Testing Acidity and Basicity Using Litmus Paper (Format of scientific writing will include Introduction, Method, Results and Discussion.)
2	Reflective writing based on a thought	• Not all those who wander are lost • True wealth is not measured in money or possessions • You don't need a reason to help people • Dreams are today's answers to tomorrow's questions • Change begins at the end of your comfort zone (Format of reflective writing will be simple paragraphs on the topic.)
	Poster writing	• Say No to Plastic • Stop Cyberbullying • Road Safety: Follow Traffic Rules • My Dream City • Plant Trees, Save the Planet (Format of poster writing will be a full-page rough draft of a poster with visuals.)

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INTERNAL EVALUATION SCHEME		
NO	Particulars	Marks
1	Mid Semester Exam (Mandatory)	13
Moreover, any four components from the following can be selected for internal evaluation of students:		
2	Class Test	03
3	Open book exam/test	03
4	Open note exam/test	03
5	Self-test/ Online test	03
6	Essay/Article writing	03
7	Quizzes/Objective test	03
8	Class assignment	03
9	Home assignment	03
10	Reports Writing	03
11	Research/Dissertation	03
12	Case Studies	03
13	Viva/Oral exam	03
14	Group Discussion	03
15	Role Play	03
16	Paper presentation/Seminar	03
17	Language Lab work	03
18	Interview	03
19	Craft work	03
20	Co-curricular work	03
21	Field Assignment	03
22	Poster Presentation	03
23	Attendance	03
24	Project Work	03
Total		25

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Ques. No.	Particulars	Unit	Marks
1	Attempt a five-point summarization of the given paragraph.	1	5
2	Write a technical note on one of the following topics. (Any one of the two)		5
3	Write a scientific note on one of the following topics in IMRaD format. (Any one of the two)		5
4	Write a reflective paragraph on a thought from list given below. (any one of the two)	2	5
5	Write a visual draft of a poster from the topics given below. (any one of the two)		5
	Total Marks		25