પરિપત્ર:

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટીની સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજોનાં આચાર્યશ્રીઓને સવિનય જણાવવાનું કે સાયન્સ વિદ્યાશાખા હેઠળનો NEP-૨૦૨૦ અંતર્ગત સ્કીલ એન્હાંસમેન્ટ કોર્સનો સેમેસ્ટર-૩ નો અભ્યાસક્રમ આ સાથે સામેલ છે. આ બાસ્કેટમાં સાયન્સનાં વિષયો આપવામાં આવેલ છે.

માનનીય કુલપતિશ્રીની મંજુરી અનુસાર સદર અભ્યાસક્રમ શૈક્ષણિક વર્ષ જુન,૨૦૨૪ થી અમલવારી કરવાની રહે છે. સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજો ધ્વારા તેની અમલવારી કરવા જણાવવામાં આવે છે.

Bhakta Kavi Narsinh Mehta University Junagadh.

૨૨/૦૮/૨૦૨૪

ખાસ ફરજ પરના અધિકારી
(એકેડેમિક)

ક્રમાંક/બીકેએનએમયુ/એકેડેમિક/૧૧૬૦/૨૦૨૪
ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી,
સરકારી પોલીટેકનિક કેમ્પસ,
ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી રોડ,
ખડીયા, જૂનાગઢ-૩૬૨૨૬૩
તા.૨૨/૦૮/૨૦૨૪

પ્રતિ,

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

નકલ સાદર રવાના:-

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

નકલ રવાના જાણ તથા યોગ્ય કાર્યવાહી અર્થે:

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

BHAKTA KAVI NARSINH MEHTA UNIVERSITY

FACULTY OF SCIENCE

SYLLABUS FOR

SKILL ENHANCEMENT COURSE

BASKET FOR SCIENCE (HONOURS) PROGRAMME

(SEMESTER- III)

EFFECTIVE FROM JUNE, 2024

BHAKTA KAVI NARSINH MEHTA UNIVERSITY

Skill Enhancement Course (SEC)

Syllabus for Faculty of Science as per NEP

Effective from June 2024

SEMESTER-3

INDEX

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Skill Enhancement Course (SEC)
Syllabus for Faculty of Science as per NEP
Effective from June 2024
SEMESTER-3

Course Level	5.0		**Internal Marks**	12
Programme	**B.Sc (Honours)**		**External Marks**	25
Semester	3		**Practical Internal**	13
Course Type	**Skill Enhancement Course-3**		**Practical External**	-
Course Credit	02		**Prac. Ext. Exam Time**	-
Teaching Hours	Theory-15 Practical-30		**Total**	50
Course Code			**Exam Duration**	1 Hour
Course Title	**CMS with WordPress**			

Course Objectives: On successful completion of the course, the students will be able to:

- To impart basic knowledge about content management and blogging
- To impart the know how about web site development
- To demonstrate the learners how to use advanced techniques in web site designing

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

- Being able to create own blogging site
- Having technical know-how to design and develop organized web content

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
3	1	• **Content Management System:** ○ Introduction, Features, Advantages, Disadvantages, Applications ○ Basics of Blogging • **WordPress:** ○ Introduction, Features, Advantages, Disadvantages ○ Installation of WordPress. ○ WordPress Directory & file structure. ○ Dashboard overview ○ working with page, category, post, tags, and media ○ User Roles and Responsibilities ○ Modifying Settings (General, Reading, Writing, Discussion, Media, Permalinks) ○ Database Structure	**05**
	2	• **Theme:** ○ Introduction, installation and activation	**10**

		○ Common WordPress themes and Template files • **Widget:** ○ Introduction ○ Widget Areas and Widget Management ○ Available Widgets (Archive, Calendar, Categories, Custom Menu, Meta, Pages, Recent Comments, Recent Posts, RSS, Search, Tag Cloud, Text) • **Plugins:** ○ Introduction, installation and activation ○ Useful Plugins (SEO Yoast, Google Analytics, WooCommerce, Page Builder)	
	3	**Practical**	**30**

Suggested Reading:

1. Teach Yourself VISUALLY Word Press, 3rd Edition**,** George Plumley
2. Build Your Own WordPress Website: An Ultimate Guide for Small Business Owners, Paperback by WordPress Genie

Website References:

1. https://www.tutorialspoint.com/wordpress/
2. https://www.wpbeginner.com/category/wp-tutorials/
3. https://www.siteground.com/tutorials/wordpress/
4. https://learn.wordpress.com/

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 <u>any Four</u> 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**
1	Questions (Any Two Out Of Four)	1	**10**
2	Questions (Any Two Out Of Four)	2	**10**
3	Questions (Any One Out Of Two)	From Each Unit	**05**
		Total Marks	**25**

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Course Level	5.0		**Internal Marks**	25
Programme	**B.Sc (Honours)**		**External Marks**	25
Semester	3		**Practical Internal**	-
Course Type	**Skill Enhancement Course-3**		**Practical External**	-
Course Credit	02		**Prac. Ext. Exam Time**	-
Teaching Hours	30		**Total**	50
Course Code			**Exam Duration**	1 Hour
Course Title	**LIFE SPAN DEVELOPMENT**			

Course Objectives: On successful completion of the course, the students will be able to:

- To become acquainted with development stages from birth to old age.
- To develop awareness of importance aspects of development during the whole life span.
- To understand the issues faced and adjustment required at each stage across the life span

Course Learning Outcomes: After completion of the course of the study:

- The students will be aware of how a child Develops from conception to Childhood and its developmental functions according to the stage.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
3	1	**Stages of Prenatal Development** • Meaning of Conception and pregnancy • Stages of Prenatal Period/ Pregnancy • Outline of Prenatal Development • Factors affecting prenatal development	**15**
	2	**Infant Stage and Childhood (Birth to 2 Years)** • Concept and Development task of infant stage • Childhood - Early Childhood (2-6 years): Concept, Characteristic and Developmental Task - Late Childhood (6-12 years) : Concept and Developmental Task	**15**

Suggested Reading:

1. Kumar R. ,1988, Child Development in India- Ashish Publishing House, New Delhi
2. Godhasara, 2016, Child Development An Overview- Cyber Tech, Publications new Deldi- ISBN-978-93-5050-472-2
3. Agraval,bansal,1999, shishusvasthay – shyamprakashanjayapur –ISBN-81-87247-14-2
4. Barushi,1992, matrulakaavambalvikas, sahityprakashanagara
5. Rajahans , 1986, balvikasavammanaviysambansh- hindigranth, akadamibihar

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 <u>any Four</u> 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
1	Questions (Any Two Out Of Four)	1	**10**
2	Questions (Any Two Out Of Four)	2	**10**
3	Questions (Any One Out Of Two)	From Each Unit	**05**
		Total Marks	**25**

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Course Level	5.0		**Internal Marks**	-
Programme	**B.Sc (Honours)**		**External Marks**	-
Semester	3		**Practical Internal**	25
Course Type	**Skill Enhancement Course-3**		**Practical External**	25
Course Credit	02		**Prac. Ext. Exam Time**	2 Hours
Teaching Hours	4 Hours/Batch/Week		**Total**	50
Course Code			**Exam Duration**	2 Hours
Course Title	**Advanced SciLab [FOSS]**			

Course Objectives: Understand the concept of matrix inversion.

- Learn the Gauss Elimination method for finding the inverse of a square matrix.
- Implement Scilab code to compute the inverse of a given matrix using Gauss Elimination.
- Understand the system of simultaneous linear algebraic equations.
- Learn the Gauss Elimination method for solving such systems.
- Implement Scilab code to solve a system of linear equations using Gauss Elimination.
- Understand the Gauss-Jordan elimination technique.
- Learn how to find the inverse of a matrix using Gauss-Jordan method.
- Implement Scilab code to compute the inverse of a given matrix using Gauss-Jordan elimination.
- Compare the results with the Gauss Elimination method.
- Extend the knowledge of Gauss-Jordan elimination to solve systems of linear equations.
- Implement Scilab code to solve a system of equations using Gauss-Jordan elimination.
- Compare the solutions obtained with those from Gauss Elimination.
- Understand the concept of eigenvalues and eigenvectors.
- Learn how to compute eigenvalues and eigenvectors of a given matrix.
- Implement Scilab code to find eigenvalues and eigenvectors.
- Understand the process of diagonalization.
- Implement Scilab code to diagonalize a given 3x3 matrix.
- Introduce the Cayley-Hamilton theorem and learn how to find the inverse of a matrix using this theorem.
- Implement Scilab code to compute the inverse based on the Cayley-Hamilton theorem.
- Understand parametric curves and their representations.
- Learn how to plot graphs of specific curves.
- Implement Scilab code to draw graphs of cycloid, catenaries, and the given spiral.

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Course Learning Outcomes: **After completion of the course, a student will be able to do the followings:**

- Understand the fundamental concepts of matrices, including matrix addition, subtraction, and multiplication.
- Learn techniques for finding the inverse of a square matrix using both Gauss Elimination and Gauss-Jordan methods.
- Apply Scilab programming skills to compute matrix inverses.
- Verify the correctness of the computed inverses by checking matrix multiplication with the original matrix.
- Learn the steps involved in Gaussian elimination and Gauss-Jordan elimination.
- Interpret the solutions obtained in the context of the original problem.
- Understand the significance of eigenvalues and eigenvectors in linear algebra.
- Learn how to compute eigenvalues and eigenvectors for a given matrix.
- Apply Scilab programming to find eigenvalues and eigenvectors.
- Understand the concept of diagonalization.
- Apply Scilab code to diagonalize a 3x3 matrix.
- Understand the Cayley-Hamilton theorem and its application.
- Implement Scilab code to compute the inverse based on Cayley-Hamilton theorem.
- Learn how to draw graphs of cycloids, catenaries, and spirals by using SciLab.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours/ Week
3	1	To find the inverse of a matrix using **GAUSS ELIMINATION** method.	**4**
	2	To solve given system of simultaneous linear algebraic equations using **GAUSS ELIMINATION** method.	
	3	To find inverse of given matrix using **GAUSS-JORDAN** method	
	4	To solve given system of simultaneous linear algebraic equations using **GAUSS-JORDAN** method.	
	5	To find **Eigen values** and **Eigen vectors** of given matrix	
	6	Diagonalize the given square matrix of order 3×3.	
	7	To find inverse of given matrix using **CAYLEY-HAMILTON** theorem	
	8	To draw graphs of **Cycloid**	
	9	To draw graphs of **Catenaries**	
	10	**To draw the graph of the spiral r = exp(-theta/10)**	

Suggested Reading:

1. "Introduction to Scilab: For Engineers and Scientists" by Sandeep Nagar

    - Publisher: Apress
    - Edition: 1st Edition
    - Publication Year: 2017
    - ISBN: 978-1484231916

2. "Scilab by Example" by Dr. S. C. Coutinho

    - Publisher: PHI Learning Pvt. Ltd.
    - Edition: 1st Edition
    - Publication Year: 2013
    - ISBN: 978-8120347269

3. "Scilab Textbook Companion for Numerical Methods" by S. K. Gupta and Anjali Gupta

    - Publisher: New Age International Pvt. Ltd.
    - Edition: 1st Edition
    - Publication Year: 2010
    - ISBN: 978-8122427640

4. "Scilab: A Practical Introduction to Programming and Problem Solving" by Tejas Sheth and Satish Annigeri

    - Publisher: CRC Press
    - Edition: 1st Edition
    - Publication Year: 2013
    - ISBN: 978-1466587721

5. "Scilab for Real Dummies" by Dr. S. C. Coutinho

    - Publisher: PHI Learning Pvt. Ltd.
    - Edition: 1st Edition
    - Publication Year: 2014
    - ISBN: 978-8120350429

6. Visit: https://scilab.in/spoken-tutorial

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Evaluation of 50 Marks (2 Credit Paper)

Continuous and Comprehensive Evaluation (**CCE**)-Formative- **25 Marks**	Semester End Evaluation (**SEE**)-Summative-**25 Marks**
Practical's (25 Marks) 1. Performance 15 Marks 2. Viva-voce 10 Marks	**Practical's (25 Marks)** 1. Performance 15 Marks 2. Viva-voce 05 Marks 3. Journal 05 Marks
Total 25 Marks	**Total 25 Marks**

Paper Style for SEE:

Que. No.	Particulars	Marks
1	Answer any THREE out of FIVE (each of 5 Marks)	**15**
2	VIVA	**05**
3	JOURNAL	**05**
	Total Marks	**25**

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SEMESTER-3

Course Level	5.0		**Internal Marks**	25
Programme	**B.Sc (Honours)**		**External Marks**	25
Semester	3		**Practical Internal**	-
Course Type	**Skill Enhancement Course-3**		**Practical External**	-
Course Credit	02		**Prac. Ext. Exam Time**	-
Teaching Hours	30		**Total**	50
Course Code			**Exam Duration**	1 Hour
Course Title	**MUSHROOM CULTIVATION**			

Course Objectives: On completion of the course, the students will be able to:

- Recall various types and categories of mushrooms.
- Demonstrate various types of mushroom cultivating technologies.
- Examine various types of food technologies associated withmushroom industry.
- Value the economic factors associated with mushroomcultivation
- Device new methods and strategies to contribute to mushroomproduction.

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

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
3	1	**Mushrooms**: • History, Scope, Vegetative characters, Nutritional values of mushrooms. **Types of Mushrooms:** **Edible Mushrooms: Button mushroom** (Agaricus bisporus), **Oyster mushroom** (Pleurotus sajor-caju) and **paddy straw mushroom** (Volvariella volvcea). **Poisonous Mushrooms:** Amanita phalloides.	**15**
	2	**Mushroom cultivation:** • Mushroom bed preparation- Preparation of mother culture, media preparation, inoculation, incubation and spawn production. • Spawning, spawn running, harvesting and Cultivation of oyster mushroom using paddystraw/agricultural wastes.	**15**

Suggested Reading:

1. Marimuthu, T. et al. (1991). Oster Mushroom. Department of Plant Pathology. Tamil NaduAgricultural University, Coimbatore.
2. Nita Bhal. (2000). Handbook on Mushrooms. 2nd ed. Vol. I and II. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Pandey R.K, S. K Ghosh, 1996. A Hand Book on Mushroom Cultivation. Emkey Publications.
4. Pathak, V. N. and Yadav, N. (1998). Mushroom Production and Processing Technology. Agrobios, Jodhpur.
5. Tewari Pankaj Kapoor, S. C. (1988). Mushroom Cultivation. Mittal Publication, New Delhi.
6. Tripathi, D.P. (2005) Mushroom Cultivation, Oxford & IBH Publishing Co. PVT.LTD, New Delhi.

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

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	5.0		**Internal Marks**	-
Programme	**B.Sc (Honours)**		**External Marks**	-
Semester	III		**Practical**	25
Category of Course	**Skill Enhancement Course-3**		**Theory**	25
Course Credit	2		**Practical Exam Duration**	2 Hrs
Teaching Hours	15T +30P = 45		**Total**	50
Course Code			**Theory Exam Duration**	1 hrs
Course Title	**Principles of Inorganic Qualitative and Gravimetric Analysis**			

Course Objectives:

- Enable learner to develop a skill of carrying out qualitative analysis of inorganic material using various primary and solubility tests and also quantitatively analyse the metals in solution very precisely using gravimetric analytical method.
- The learners will be able to carry out various laboratory skills like preparation of diluted solutions, precipitation, digestion, decantation, filtration, washing, use of police band, scratching, removal or various ionic impurities, weighing, drying, burning the ashless filter paper using burner flames.
- This analysis will enable them learn various weighing machines and understand the importance accuracy in weighing up to 0.0001 gram.

Course Learning Outcomes: After completion of the course:

- The learners will be able to carry out qualitative analysis of elements forming inorganic salts and identify the radicals present in unknown pure salt mixture. They will be able to identify the types of radicals that are formed, their solubilities in water and chemical nature. Leaners will be able to distinguish their properties in dried and solution states and determine their group using various solubility tests using the principles of IP and Ksp. The concepts of interfering radicals and its effects in qualitative analysis of salts will be clearer to them.
- The learner will be able to carry out quantitative analysis of metal present in a given solutions with or without a particular impurity using gravimetric analysis with an accuracy

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Sem	Unit No.	Syllabi	Teaching Hours
3	1	**Principle of Inorganic Qualitative Analysis and Gravimetric Analysis** Introduction, Preparation of Original Solution (OS), Concept of classification of cations (IP and Ksp) and role of Group reagents Explanation with chemical equations for the following A. Dry test for positive radicals (1) Charcoal test, (2) Cobalt nitrate test& (3) Flame test. B. Dry test for negative radicals (including use of various reagent papers)	**7T**
	2	**Principle of Gravimetric analysis**: Factors affecting gravimetric analysis, Co-Precipitation and Post precipitation, Completeness of precipitation, Effect of acid and Temperature on solubility, Purity of ppt, Super saturation, Coagulation. Operation in gravimetric analysis like Solution formation, Precipitation, Filtration, Washing, Drying, Incineration, Weighing.	**8T**

Credit Practical: **Gravimetric analysis**

Sem	Syllabi	Teaching Hours
3	**Gravimetric Analysis: Minimum six Gravimetric analysis exercises with three containing impurities of Cu or Fe and three pure solutions may be given.** 1. Estimation of nickel (II) in a mixture of solution containing $NiSO_4$, $CuSO_4$ and free H_2SO_4 as $Ni(DMG)_2$ complex using Dimethylglyoxime (DMG). 2. Estimation of copper as CuSCN 3. Estimation of Fe^{+2} as Fe_2O_3 in a solution containing a (mixture of $CuSO_4$ and) $FeSO_4$ NH_4SO_4 by precipitating iron as $Fe(OH)_3$. 4. Estimation of Al (III) from the solution mixture containing $CuSO_4$ $AlSO_4$ and H_2SO_4 as Al_2O_3 or by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate) 5. Estimation of Ba as $BaSO_4$ in a mixture of solution containing $BaCl_2$, $FeCl_3$ and HCl. 6. Estimation of Mn in a mixture of solution containing $MnCl_2$, $CuCl_2$ and HCl as $Mn_2P_2O_7$. 7. Estimation of Zn in a mixture of solution containing $ZnSO_4$, $CuSO_4$ and H_2SO_4 as $Zn_2P_2O_7$.	**30P**

Suggested Reading:

1. Principles of Inorganic chemistry – Puri, Sharma & Kalia
2. Concise Inorganic Chemistry - J. D. Lee
3. Advanced Inorganic Chemistry- Cotton and Wilkinson
4. Basic Inorganic Chemistry - Gurdeep & Chatwal
5. Vogel's quantitative chemical analysis
6. Engineering Chemistry by Jain and Jain
7. Industrial Chemistry by B.K. Sharma
8. Handbook of practical chemistry by shubhash and satish
9. Thin Layer Chromatography by Egal Stall
10. Chromatographic separation by Tata McGraw Hill
11. A Textbook of Quantitative Inorganic Analysis by A. I. Vogel
12. Inorganic qualitative analysis by Vogel and Gehani Parekh
13. Reigel's Handbook of Industrial Chemistry by James A. Kent
14. Fundamental of Analytical Chemistry by Skoog and West
15. Mikes, O. & Chalmes, R.A. Laboratory Hand Book of Chromatographic & Allied
16. Methods, Elles Harwood Ltd. London.
17. Ditts, R.V. Analytical Chemistry – Methods of separation.
18. Jack T. Ballinger; Gersshon J. Shugar. Chemical Technicians' Ready Reference Hand bok, 5th Edition, 2011, ISBN:9780071745925, The McGraw-Hill com, Incpanies
19. Vogel's inorganic qualitative analysis

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 <u>any Four</u> 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**
1	Any two out of 3 questions (5 marks each)	**1**	**10**
2	Any two out of 3 questions (5 marks each)	**2**	**10**
3	Any one out of 2 questions (5 marks each)	**One Question from Each Unit**	**05**
	Total Marks		**25**

BHAKTA KAVI NARSINH MEHTA UNIVERSITY
Skill Enhancement Course (SEC)
Syllabus for Faculty of Science as per NEP
Effective from June 2024
SEMESTER-3

Course Level	UG (5.0)		**Internal Marks**	-
Programme	**B.Sc (Honours)**		**External Marks**	25
Semester	III		**Practical Internal**	-
Category of Course	**Skill Enhancement Course-3**		**Practical External**	-
Course Credit	01		**Prac. External Exam Duration**	-
Teaching Hours	30		**Total**	25
Course Code			**Exam Duration**	1 Hrs.
Course Title	**Microbiological Analysis of Air, Water & Soil to Pollution Control (Theory)**			

Course Objectives: By completing the course, students have to:

- Course objective is to improve the skill and enhance the knowledge in the field of microbiology.
- To explore the role of microbes in the air, water and soil.

Course Learning Outcomes: After completion of the course:

- Have developed a very good understanding and skills of the analysis of air, water and soil.
- Have developed a very good understanding of how analysis of water, air and soil contribute to control of environmental pollution.

Course Content

Sem	Unit No.	Syllabus	Teaching Hours
3	1	**Aero- microbiology** • Aero- microbiology: Bioaerosols, Air borne microorganisms (bacteria, Viruses, fungi) and their impact on human health and environment, • Significance in food and pharma industries and operation theatres, allergens.	**8**
	2	**Water- microbiology** • Water borne pathogens, water borne diseases. • Sample Collection, Treatment and safety of drinking(potable)water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive/MPN tests, confirmed and completed tests for faecal coliforms (b) Membrane filter technique and (c) Presence/absence tests	**8**

	3	**Control Measures** • Control Measures: Fate of bioaerosols, inactivation mechanisms – UV light, HEPA filters, desiccation, Incineration. • Precipitation, chemical disinfection, filtration, high temperature, UV light	**7**
	4	**Soil Microbiology** • Soil- microbiology: Soil borne pathogens, soil borne diseases, Sampling of soil, sample collection and analysis. • Isolation and identification of pathogens. Soil testing methods. Soil treatment.	**7**

Suggested Reading:

1. Medigan, M.T., Martinko, J. M. and Parker, J. Brock Biology of Microorganisms. Pearson Education Inc., New York
2. Alexander, M John. Microbial ecology. Wiley & Sons, Inc., New York.
3. Alexander, M John. Introduction to soil microbiology.Wiley & Sons Inc., New York.
4. Barker, KH, and Herson, D.S. Bioremediation. Mc Craw Hill Inc., New York.
5. Chapelle, F.H. Ground Water Microbiology and Geochemistry. New York: John Wiley & Sons, 2000.
6. K.R. Aneja. Laboratory Manual of Microbiology and Biotechnology New Age Publications.2014

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SEMESTER-3

Course Level	**UG (3.0)**		**Internal Marks**	25
Programme	B.Sc. Microbiology		**External Marks**	-
Semester	III		**Practical Internal**	-
Category of Course	**SEC-3**		**Practical External**	-
Course Credit	01		**Prac. External Exam Duration**	1 Hrs.
Teaching Hours	30		**Total**	25
Course Code	**SECMBP301**		**Exam Duration**	-
Course Title	**Microbiological Analysis of Air, Water & Soil to Pollution Control (Practical)**			

Course Objectives:

1. Course objective is to improve the skill and enhance the knowledge in the field of microbiology.
2. Main objective is to understand the role of microbes in the air, water and soil.

Course Learning Outcomes: After completion of the course:

1. Have developed a very good understanding and skills of the analysis of air, water and soil.
2. Have developed a very good understanding of how analysis of water, air and soil contribute to control of environmental pollution.

Suggested Practical

Sr. No	Practical content	Teaching Hrs
1.	Chemical analysis of water: Chloride, Hardness, Nitrite Nitrogen, Alkalinity, Acidity, TDS, TSS, TS	30
2.	Isolation and Determination of air flora and air density from indoor & outdoor sources.	
3.	Isolation and identification of coli forms from Water by Presumptive, Confirmed & Completed test.	
4.	Isolation and cultivation of bacteriophage of *E.coli* from the given sewage sample	
5.	Field Visit to Sewage treatment plant / Forest / Sanctuary / Soil Research Laboratory / Environmental laboratory/ GPCB Station and preparation of report	
6.	Study the prevention and control of organism using UV light.	
7.	Study the filtration techniques to study the control of organisms.	

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.
3. Dubey. R.C., Maheshwari. D.K., Practical Microbiology, S.Chand & Company Ltd., New Delhi
4. Konika Sharma., manual of Microbiology – Tools & Techniques, Ane Books, Delhi.

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

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**	

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Course Level	5.0		**Internal Marks**	25
Programme	**B.Sc (Honours)**		**External Marks**	25
Semester	III		**Practical Internal**	--
Category of Course	**Skill Enhancement Course-3**		**Practical External**	--
Course Credit	02		**Prac. External Exam Duration**	--
Teaching Hours	30		**Total**	50
Course Code			**Exam Duration**	2 hrs
Course Title	**Medical Diagnostics**			

Course Objectives:

- This course is designed to familiarize the students regarding various dimensions of Medical lab technology and career opportunities available in these fields.
- To develop practical understanding among the students associated with Medical lab through classroom discussion/ participation and projects.
- To develop transferrable skills among the students for managing Laboratory works efficiently so that they could be ready to join the Laboratory functions in any organization.

Course Learning Outcome: Upon completion of the course, students should be able to:

- Learn fundamental practical skills in Medical Diagnostics for further studies and /or employment.
- Learn about the clinical significance of different tests.
- Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.

COURSE CONTENT		
Units	**Syllabi**	**Teaching Hours**
Unit 1	• Introduction to Medical Diagnostics and its Importance • Diagnostic Methods Used for Analysis of Blood: Blood composition, pulse rate & blood pressure, ABO blood group & Rh factor, estimation of Hemoglobin by Sahli's Method, RBC and WBC count, beeding time & clotting time, DLC (differential leucocyte count), Red cell indices- MCV, MCH, MCHC. • Physical and chemical diagnostic for Urine Analysis: Normal and abnormal urine constituents.	**15**
Unit 2	• Non-infectious Diseases: Causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit • Infectious Diseases: Causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis • To study Medical Imaging Techniques – X-ray, PET Scan (Positron emission tomography), MRI (Magnetic Resonance Imaging), CT Scan, ECG, EEG, ECHO Tests.	**15**

REFERENCE BOOKS:

1. Preventive and Social Medicine…….. Park, K.
2. Textbook of Medical Laboratory Technology……. Godkar P.B. and Godkar D.P.
3. A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses.. Cheesbrough M.
4. Textbook of Medical Physiology……. Guyton A.C. and Hall J.E.
5. Pathologic Basis of Disease……. Robbins and Cortan
6. Lab Manual on Blood Analysis and Medical Diagnostics…….Prakash G.

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SEMESTER-3

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.3	Question 1	**1 & 2**	**05**
	Or		
	Question 2		
	Total	**25**	

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Course Level	5.0		**Internal Marks**	
Programme	**B.Sc (Honours)**		**External Marks**	
Semester	III		**Practical Internal**	25
Category of Course	**Skill Enhancement Course-3**		**Practical External**	25
Course Credit	02		**Prac. External Exam Duration**	2 HOURS
Teaching Hours	30		**Total**	50
Course Code			**Exam Duration**	2 HOURS
Course Title	**Instrumentation and Analysis with Multimeter and CRO**			

Course Objectives:

- The course aims to provide students with a comprehensive understanding of Multimeter and cathode ray oscilloscopes (CRO), focusing on their fundamental principles, components, and functionalities. Students will gain proficiency in operating these instruments to measure and analyse electrical parameters and signals across various electronic devices.
- Through practical, hands-on sessions, the course will enhance students' skills in using these tools effectively for troubleshooting and experimentation. Additionally, it will cover the diverse applications of these instruments in electronics and electrical engineering, teaching students to critically evaluate their performance, including their sensitivity, merits, and demerits, to make informed decisions in their professional practices.

Course Learning Outcomes:

- Upon completion of the course, students should be able to:
- Describe the functions, components, and types of Multimeter and CRO.
- Use a Multimeter as a voltmeter, ammeter, and ohmmeter, as well as using a CRO to observe and measure electronic signals.
- Demonstrate the ability to apply their knowledge and skills in practical settings, effectively using these instruments in real-world applications.
- Analyze the sensitivity and accuracy of the instruments and understand their practical implications in measurements.

Course Contents:

Unit No.	Syllabi	Teaching Hours
1	**Multimeter** **1.** Introduction **2.** Multimeter **3.** Multimeter as Voltmeter **4.** Multimeter as Ammeter **5.** Multimeter as Ohmmeter **6.** Applications of Multimeter **7.** Sensitivity of Multimeter **8.** Merits and Demerits of Multimeter **9.** Hands on experiment and use of Multimeter	**15**
2	**Cathode Ray Oscilloscope** **1**. Introduction **2**. Cathode Ray Oscilloscope **3**. Cathode Ray Tube **4**. Deflection Sensitivity of CRT **5.** Various Controls of CRO **6.** Applications of CRO **7.** Hands on experiment and use of CRO	**15**

Suggested Reading:

Text Books:

1. Principles of Electronics by V.K.Mehta & Rohit Mehta, Publishers: S.Chand.
2. B.Sc. Practical Physics by C.L.Arora, Publishers: S.Chand.

Reference Books:

1. Modern Engineering Physics by A.S.Vasudeva, Publishers: S.Chand
2. Modern Physics by R. Murugeshan & Kiruthinga Sivaprasath, Publishers: S.Chand

Electricity and Magnetism by D.C. Tayal Publisher: Himalaya Publishing House

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 <u>any Four</u> from Sr.No.2 to 24. Each Contains three marks. Student should secure 09 Marks for passing in internal Exam.

Paper Style

Sr. No.	Particulars	Marks
1	Understanding of Practical	15
2	Reading	10
	Total Marks	25

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Course Level	5.0		**Internal Marks**	25
Programme	Science		**External Marks**	25
Semester	3		**Practical Internal**	-
Course Type	Skill Enhancement Course-3		**Practical External**	-
Course Credit	02		**Prac.Ext.Exam Time**	-
Teaching Hours	30		**Total**	50
Course Code			**Exam Duration**	1 Hour
Course Title	**Conversational Skills-1**			

Course Objectives:

- To introduce conversational skills in students.
- To develop basic proficiency in English conversational skills.
- To make students able to understand usage of English language in conversations.
- To enable students for writing in formal situations.

Course Learning Outcomes: After completion of the course:

- Students will be able to understand usage of conversational skills.
- Students will be able to make conversations in English.
- Students will be able to understand usage of English language in conversations.
- Students will be able to write in formal situation.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
3	1	• Speaking Situations (Greetings & Courtesy, day time, bed time, after getting up) • Relationships • Classroom conversation & statements (personal introduction, festivals, seasons) • Dialogue writing	**15**

	2	• Conversational Skills Situations: learning about occupations and activities & sentence formation • Describing Personality and Appearance (clothing, like-dislikes) • Telephonic conversation and time expression, Leave taking (Favorite things, Weather, concern for person) • Paragraph development • Picture description	**15**

Suggested Reading:

1. How to talk to Anyone by Leil Londes
2. Business Communication by Urmila Rai and S.M. Rai. Himalaya Publishing House
3. Practical English Usage by Michael Swan
4. English Grammar & Composition by Wren & Martin

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.

Paper Style

Ques. No.	Particulars	From which Unit	Marks
1	• Give appropriate response in following conversation. (5 Marks) • Write a dialogue on the following situations. (5 Marks) (1/2)	**1**	**10**
2	Develop paragraphs on the following (Guided) (2/3).	**2**	**10**
3	Describe the given picture in 10 sentences.	**2**	**05**
	Total Marks		**25**

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Course Level	**U.G. (5.0)**		**Internal Marks**	
Programme	Science		**External Marks**	50
Semester	**III**		**Practical Internal**	-
Category of Course	Skill Enhancement Course-03		**Practical External**	-
Course Credit	02		**Prac. External Exam Duration**	-
Teaching Hours	4 Hrs./ Week		**Total**	50
Course Code	**SECFS301**		**Exam Duration**	**2 hrs.**
Course Title	**Separation Techniques - Electrophoresis**			

Sr No.	Syllabus	Teaching Hours/ Week
1	Introduction, General Principles	**4**
2	Factors affecting electrophoresis	
3	Low voltage thin sheet electrophoresis & High voltage electrophoresis	
4	Sodium dodecyl sulfate (SDS) polyacrylamide gel electrophoresis (PAGE), Isoelectric focusing (IEF), Iso-electrophoresis.	
5	Preparative electrophoresis, Horizontal and Vertical Electrophoresis	

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SEMESTER-3

SECFS301: Separation Techniques – Electrophoresis

Time: 3 Hours **Total Marks: 50**

Total Scheme of evaluation

Internal Exam

Total Marks: 25

Semester	Total distribution of mark			
	Internal			
	Exam	Home Assignment	Class Assignment	Attendance
III	10	05	05	05

External Exam

Time: 2.5 Hours **Total Marks: 25**

Instructions:

1. This question paper contains **Three** questions. **All** questions are compulsory.
2. Write answers to **all** the questions in main answer sheet.
3. Draw neat and labelled diagram wherever necessary.
4. Figures to the right side indicate full marks for the question.

Sr. No.	Questions	Marks
1	Answer any one in detail. (**Any One**)	10
2	Answer any one in detail. (**Any One**)	10
3	Answer any one in detail. (**Any One**)	05