।। सा विद्या या विमुक्तये ।।
स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड
"ज्ञानतीर्थ" परिसर, विष्णुपूरी, नांदेड - ४३१६०६ (महाराष्ट्र)
SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED
"Dnyanteerth", Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)
Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'A' Grade
25 1994 - 2019 SILVER JUBILEE YEAR

ACADEMIC (1-BOARD OF STUDIES) SECTION

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न्यू मॉडेल डिग्री कॉलेज, हिंगोली येथील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील द्वितीय वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक ०८ जून २०१९ रोजी संपन्न झालेल्या ४४व्या मा. विद्या परिषद बैठकीतील ऐनवेळचा विषय क्र.११/४४–२०१९** च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **न्यू मॉडेल डिग्री कॉलेज, हिंगोली** येथील **विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील द्वितीय वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्यात येत आहेत.

1. Biotechnology

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी.

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.: शैक्षणिक–१/परिपत्रक/न्यूमॉडिकॉहिं/पदवी–सीबीसीएस अभ्यासक्रम/२०१९–२०/४६८
दिनांक : ११.०७.२०१९.

स्वाक्षरित/–
उपकुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :

१) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, न्यू मॉडेल डिग्री कॉलेज, हिंगोली.
४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

Swami Ramanand Teerth Marathwada University Nanded's

New Model Degree College, Hingoli

B.Sc. Biotechnology (CBCS) , II -Year

Syllabus effective from 2019-20 onwards

Salient Features:

The contextual curriculum constructed for B.Sc. Biotechnology second year is related to the projected educational objectives of higher education and the Tyagrajan committee constituted for Model colleges throughout India. During designing the curriculum care has been taken understand to difficulties and needs of students of all sections of the society and from educationally backward areas are considered for enhancing employability and maximizing opportunities for further education and to serve the need of learner centric Choice Based Credit System (CBCS) course structure to orient and practically train students in the field of Biotechnology. During developing curricula the. The entire Second year curriculum is divided into three streams namely Language Curriculum, Major Curriculum and Life Skill Curriculum weighted in the ratio 8:18:4. The course under Language Curriculum consists of Marathi/ Hindi as Indian language and English as compulsory language for both semesters. The major curriculum is divided as major core , Supportive and innovative curriculum. Under this Biochemistry, Genetics Seminar, Field Visit are major core; Immunology is supportive and Lab Course-3 is applied curriculum for Third Semester. Whereas Metabolism, molecular Biology Seminar, Field Visit are major core; Developmental Biology is supportive and Lab Course-4 is applied curriculum for Fourth semester. The Life-Skill Curriculum *Is categorized into Job Oriented and Value Oriented curriculum.* History of Marathwada, Civilizational Backdrop of India , Folklore and Folk History of Maharashtra are value oriented courses; Ethics, Patenting and Bio-entrepreneurship is job oriented curriculum for Third semester whereas Religious and communal harmony, Peace and conflict resolution, freedom struggle of India are value oriented courses; Plant tissue culture and plant biotechnology is job oriented curriculum for Fourth semester.

Utility:

The curriculum of B.Sc. Second year Biotechnology course will train the students in field Indian and English languages. The syllabus of major curriculum will be helpful in understanding basic and applied concepts in the field of Embryology, Biomolecules, Genetics and Immunology. The courses in Value oriented Skills will present and cultivate history and culture of India among students. The job oriented curriculum will fulfill the local needs of farmers and will helpful protecting the intellectual property of our country .

Learning Objectives:

1. To pass on knowledge of basic and applied biotechnology.
2. To design the curriculum that enable students to prepare for JAM and other competitive examinations of M.Sc. admission and other competitive examinations successfully.
3. To make the students aware of Indian culture, folks and history.
4. To brought balance between highly instrumentalized, market driven soft-skills and a value oriented and general life enhancing skills.
6. To match students Indian language and English language competencies.

Prerequisites:

The course is offered for a student registered for undergraduate programme in the faculty of Science and Technology who had primary knowledge and training in the field of basic biological, chemical, mathematical and physical sciences and interested to gain additional advanced knowledge in the field of biotechnology.

Swami Ramanand Teerth Marathwada University Nanded's
New Model Degree College, Hingoli
B.Sc. Biotechnology (CBCS)
II -Year, III -Semester
Syllabus effective from 2019-20 onwards

Course Code	**Course Title**	**Credits**	**Total Credits**
BBT 3-IA भारतीय भाषा	मराठी भाग- 03/ हिंदी भाग-03	**04**	**30**
BBT 3-IB English	**Critical Reasoning, Writing and Presentation**	**04**	
BBT 3-IIA-A Major (Core)	**Biochemistry**	**04**	
BBT 3-IIA-B Major (Core)	Genetics	**04**	
BBT 3-IIB Major (Supportive)	**Immunology**	**04**	
BBT 3-IIC Major (Innovative)	Lab Course-3	**04**	
BBT 3-IIIA Job Oriented Life Skills	Ethics, Patenting and Entrepreneurship	**02**	
BBT 3-III B Value Oriented Life Skills	History of Marathwada / Civilizational Backdrop of India / Folklore and Folk History of Maharashtra	02	
BBT 3-IIA-C Major (Core)	Seminar	01	
BBT 3-IIA-D Major (Core)	Field Visit	01	

Note:
1. Code BBT3-IA, BBT3-IB are Language Curriculums.
2. Code BBT 3-IIA-A, BBT 3-IIA-B, BBT 3-IIA-C, BBT 3-IIA-D, BBT3-IIB, BBT3-IIC are Major Curriculums.
3. BBT3-IIIA, BBT3-III B are Life Skill Curriculums.

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ , नांदेड संचलित

न्यू मॉडेल डिग्री कॉलेज,हिंगोली

बी.एस्सी. जैवतंत्रज्ञान (सत्र पद्धती)

तिसरेसत्र (भाषा अभ्यास)

BBT3 – IA: **मराठी भाग-०3 (भारतीय भाषा)**

एकूण गुण:अंतर्गत ५० + बहिस्थ५० rkl : 45

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v- dFkk okM:e; %& 12 rkl

1. पहिलेच भांडण – ह. ना. आपटे
2. बेगड – योगीराज वाघमारे
3. ईद – अमर हबीब
4. तीची वाटच वेगळी – मधु सावंत

c- o|pkfjd %& 13 rkl

1. शील व सौजन्य नसेल तर – डॉ. बाबासाहेब आंबेडकर
2. छत्रपती शाहू आमचा लोकसिध्द ईश्वर – डॉ. आ.ह.साळुंके
3. शेवटचे किर्तन – संत गाडगेबाबा.
4. शेतक–यांच्या दु:खाचे सनात मुळ – शेषराव मोरे.

d- lkfgR;'kkL= &Lo#i] i;kt u] 'kCn'kDrh 09 rkl

M- 0;kogkfjd ejkBh %& 11 rkl

1. मुलाखत
2. कार्यक्रमाचे संयोजन
3. संगणक आणि मराठी भाषा
4. मराठी प्रमाणलेखनाचे नियम.

lanHkZ xzaFk lwph

1. निवडक मुलाखती– भालचंद्र नेमाडे लोकवाड़मय ग्रह, मुंबई
2. सुगम मराठी व्याकरण लेखन– मो.रा.वाळंबेनितीन प्रकाशन, पुणे 2007

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Language Curriculum)

BBT 3 – IA हिंदीभाग- 03 **(**भारतीयभाषा**)**

Marks: Internal 50 + External 50 Total Periods: 45

खण्ड अ] कहानी विभाग **Periods: 13**

1] प्रेमचंद - गुल्ली-डंडा
२] मोहन राकेश - मलबे का मालिक
३] निर्मल वर्मा - परिंदे
४] ओमप्रकाश वाल्मीकि - आम्मा
५] राजी सेठ - परमा की शादी

खण्ड ब] आलोचना:स्वरुपऔरप्रकार **Periods: 10**

खण्ड क] देवनागरी लिपि की विशेषताऐं **Periods: 10**

खण्ड ड] जनसंचार के माध्यम और हिंदी भाषा **Periods: 12**

1] परंपरागत माध्यम
२] आधुनिक माध्यम

संदर्भ ग्रंथ :

1] प्रयोजनमूलक हिंदी विविध आयाम - डॉ. अम्बादास देशामुख (विकास प्रकशन कानपूर)
२] हिंदी भाषा का आधुनिकीकरण एवं मानकीकरण - श्री त्रिभुवननाथ शुक्ल (विकास प्रकाशन कानपूर)
३] व्यावहारिक हिंदी - विनोद गोदरे

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Language Curriculum)

BBT 3 – IB Critical Reasoning, Writing and Presentation (English**)**

Marks: Internal 50 + External 50 Total Periods: 45

Unit-I- Introduction to Critical Thinking. 11 Periods

1. Critical Thinking, Benefits of Critical Thinking, Barriers to Critical Thinking.
2. Arguments, Types of arguments.
3. Social Influences on Critical Thinking.
4. Characteristics of Critical and Analytical Writing.
5. Preparing for Critical Writing.

Unit-II-Accuracy in Writing 12 Periods

1. The Writing Process.
2. The Elements of Writing. .
3. Characteristics of Critical and Analytical Writing.
4. Preparing for Critical Writing

Unit- III Presentation and Documentation 10 Periods

1. Seminar Papers.
2. Project Reports.
3. Documentation
4. M.L.A. Format of Documentation

Unit-IV-Soft Skills for Academic Presentation 12 Periods

1. Audience.
2. The Objective of Presentation.
3. Techniques of Effective Presentation.
4. Visual Presentation Aids

Reference Books:

1. Sonima K.K. and Dr. Anitha Ramesh K: Critical Reasoning, Writing and Presentation University of Calicut, School of Distance Education Kerala, India.
2. Rendle-Short, Johanna. *The academic presentation: Situated talk in action*. Routledge, 2016.
3. Leary, Mark R. *Self-presentation: Impression management and interpersonal behavior*. Boulder, CO: Westview Press, 1996.
4. Gibaldi, Joseph, Walter S. Achtert, and Modern Language Association of America. *MLA handbook for writers of research papers*. New York: Modern Language Association of America, 2003.
5. Russell, Tony, et al. "MLA Formatting and Style Guide." *The Purdue OWL* (2010).
6. Tebeaux, Elizabeth. "Books of Secrets-Authors and Their Perception of Audience in Procedure Writing of the English Renaissance." *Issues in Writing* 3.1 (1990): 41.
7. Thomson, Anne. *Critical reasoning: A practical introduction*. Routledge, 2009.
8. Dauer, Francis Watanabe. *Critical thinking: An introduction to reasoning*. New York: Oxford University Press, 1989.
9. Moore, Brooke Noel, and Richard Parker. *Critical thinking*. Boston, MA: McGraw-Hill, 2009.

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Major Curriculum)

BBT 3 – IIA-A Biochemistry (Major Core**)**

Marks: Internal 50 + External 50 Total Periods: 45

Unit-I: Basics of Biochemistry **08 Periods**

1.1 Types of Biomolecules
1.2 Functional groups in Biochemistry
1.3 Concepts of Bioenergetics
1.4 Water: Structure and Functions
1.5 Biological Buffers

Unit-II: Glycobiology and Lipid Chemistry **15 Periods**

2.1 Concept of Carbohydrates
2.2 Classification of carbohydrates
2.3 Open and Ring Structure of carbohydrates
2.4 Reducing and non-reducing sugars
2.5 Brief account of techniques in Glycobiology
2.6 Fatty acids and Triglycerols
2.7 Nomenclature and classification of Lipids
2.8 Membrane lipids
2.9 Fat Soluble Vitamins
2.10 Techniques use for study of lipids

Unit –III: Protein Biochemistry **12 Periods**

3.1 Concepts and Classification of Amino acids
3.2 Biological Peptides
3.3 Concepts of peptide bond
3.4 Structural classification of proteins
3.5 Chromatographic techniques for purification of proteins

Unit-IV: Nucleotides and Nucleic acids **10 Periods**

4.1 Nucleotides and Nucleosides
4.2 Major and Minor Nitrogenous bases
4.3 Concept of base pairing
4.4 Double helical DNA structure
4.5 Types of RNA
4.6 A, B and Z form of DNA

References:

1. Principles of Biochemistry: Smith et al., McGraw - Hill International book Company, 8th Edition.
2. Principles of Biochemistry - Lehninger , Nelson, Cox, -W.H. Freeman and Company, New York
3. Fundamentals of Biochemistry: Voet et al.- John Wiley and Sons, Inc.
4. Biochemistry: Zubay- WCB publishers
5. Harper's Biochemistry: R.K. Murray, D.K. Granner, P.A. Mayes and V.W Rodwell-Prentice-Hall International.
6. Biochemistr: L.Stryer. W.H. Freeman and Company, New York
7. Colour Atlas of Biochemistry: J. Koolman, K.H. Roehm, Second Edn., Thieme Stutgart, New York
8. Biochemistry-Garrett and Grisham, Second Edition, 1998

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Major Curriculum)

BBT 3 – IIA-B Genetics (Major Core**)**

Marks: Internal 50 + External 50 Total Periods: 45

Unit-I: Overview of Genetics and Mendel's principles **10 Periods**

1.1 Brief history of genetics
1.2 Areas of genetics
a. Classical genetics
b. Molecular genetics
c. Evolutionary genetics
d. Biochemical Genetics
1.3 Mendels experiment and lows
1.4 Multiple allels and genotypic interaction

Unit-II Sex determination and linkage **11 Periods**

2.1 Sex determination patterns
2.2 Dosage compensation
2.3 Expressivity and penetrance
2.4 Sex linkage
5.5 Sex limited and sex influenced traits
5.6 Pedigree analysis

Unit III: Chromosomal Mapping and Bacterial genetics **11 Periods**

3.1 Diploid Mapping
3.2 Tetrad analysis
3.3 Somatic crossing over
3.4 Human chromosome mapping
3.4 Transformation, Conjugation, Transduction
3.5 Lysogenic and Lytic cycles

Unit IV: Cytogenetics and Evolutionary genetics **13 Periods**

4.1 Chromosome structure changes
a. Centromeric breaks
b. Duplication
c. Chromosomal rearrangements in human chromosome
4.2 Variation in chromosome number
a. Euploidy
b. Aneuploidy
c. Mosaism
4.3 Quantitative genetics
4.4 Hardy-Weinberg equation
4.5 Mechanism of speciation

REFERENCES FOR READING

1. Understanding DNA-The molecule how it works III ed.- Chris R.Calladine, Elsevier Pub.
2. Gene IX-Benjamin Lewin –Jones and Barrtlett Pub.
3. Principles of Genetics IV ed.-Simmons and Snustad- Wiley International Pub.
4. Molecular Biology of the Gene V ed.-J.D. Watson-Pearson Pub.
5. The Biochemistry of Nucleic Acids XI ed.-Adams, Knowler And Leader-Chapman Hall Pub.
6. Molecular Biology of the Cell VI ed.-Lodish, Berk-Freeman Pub.
7. Developmental Biology V ed.-Scott F. Gilbert-Sinahauer associate Pub.
8. Developmental genetics-G.S.Miglani-I.K.InternationalPub.
9. Molecular Biology of the Cell, Albert Bruce, Garland Science Publication
10. Genome- T.A. Brown, John Wiley
11. Genetics a Molecular Approach, T.A Brown, John Wiley
12. Principles of Genetics- Robert H.Tamarin The McGraw−Hill Companies

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)
III Semester (Major Curriculum)
BBT 3 – II B Immunology (Major Supportive)
Marks: Internal 50 + External 50 **Total Periods: 45**

Unit I: Basics of Immunology **11 Periods**
1.1 Brief History of immunology
1.2 Innate and adaptive immunity
1.3 Cells and Molecules involved in immune system
1.4 Primary and secondary Lymphoid Organs
1.5 Haematopoesis and cell differentiation

Unit-II : Antigen and Antibodies **12 Periods**
2.1 Immunogenicity and antigenicity
2.2 Properties of antigens
2.3 Concept of super antigen
2.4 B and T cell Epitope
2.5 Adjuvant and haptens
2.6 Structure and Functions of antibodies
2.7 Classification of antibodies

Unit-III: Antigen-Antibody interaction study **12 Periods**
3.1 Precipitation reaction
3.2 Agglutination reaction
3.3 RIA
3.4 ELISA
3.5 Immunoflurescene microscopy
3.6 Flow cytometry
3.7 Western blotting
3.8 Hybridoma Technology

Unit-IV Immune Effector Mechanism **10 Periods**
4.1 Cytokines
4.2 Complement system
4.3 T-Cell effector mechanism
4.4 Leucocyte migration and inflammation
4.5 Vaccines
4.6 Autoimmunity
4.7 Transplantation immunology

REFERENCES

1. Kuby Immunology. Goldsby, Kindt, Osborne. 6th ed.W,H Freeman & Company, New York
2. Cellular & Molecular Immunology. Abbas, Lichtman, Pillai. 6th ed. Elsevier publications.
3. Roitt's Essential Immunology. Deives, Martin, Burton, Roitt. 11th ed. Blackwell publications.
4. Cellular interactions & Immuno-biology. Butterwort & Heinemann.
5. Review of Medical Microbiology & Immunology. Warren Levinson. 9th Ed.Mac Graw Hill publications.
6. Immunology an introduction. Tizard.4thed. Thomson publications.
7. Immunology. B, Hannigan. Viva books Pvt. Ltd.
8. Immunology & Serology. K.R.Joshi, N.O. Osamo. Student edition.

4. Reaction of amino acids, sugars, lipids
5. Isolation, purity determination and quantization of cholesterol, DNA & RNA
6. Quantization of proteins and sugars & amino acids
7. Analysis of oils , iodine number , saponificaticn value acid number
8. Biochemical estimation of blood sugar
9. Color reactions of different types of carbohydrate
10. Estimation of amino and , protein , reducing sugars (Ninhydrin method / Lowry /biuret / Bradford method/ DNSA method)
11. Preparation of egg albumin, milk, casein, cystein, and starch
12. concept of buffers , pH, morality and nomarality (Problem solving and preparation)
13. Biochemical estimation of DNA/RNA
14. Estimation of Glucose, Uric acid and Billurubin from blood/Urine
15. Problems based on Mendelian genetics, Gene linkage, Sex linked inheritance and Crossing over.
16. Determination of ABO Blood group
17. Determination of total leukocyte count
18. Determination of differential leukocyte count
19. Determination of bleeding time & clotting time of blood.
20. Ouchterloney double diffusion and Radial immunodiffusion
21. Quantitative precipitation assay
22. Immuno electrophoresis
23. Latex agglutination
24. Widal Test

22.VDRL

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Life Skill Curriculum)

BBT 3 –IIIA Ethics, Patenting and Bio-Entrepreneurship (Job Oriented Life Skills**)**

Marks: Internal 50 **Total Periods: 45**

Unit- 1: Introduction to Biosafety and Bioethics **10 Periods**

1.1 Need of Bioethics and Biosafety
1.2 Defination and Applications of Biosafety and Bioethics
1.3 Human Genome Project and ethical issues
1.4 Biosafety guidelines and Regulations
1.5 GLP and GMP

Unit-2: Introduction to IPR **11 Periods**

2.1 Meaning and Forms of IPR
2.2 History and Evolution of Patent Law
2.3 Classification of Patents
2.4 Grant of Patent and Patenting Authorities
2.5 Patent owner: rights and duties

Unit-3: Need and Protection of Patenting **11 Periods**

3.1 Protection of Plant Varieties
3.2 Patent law: Present scenario
3.3 Case studies in IPR
- A. Diamond Vs Chakrabhorty case
- B. Neem and Turmeric Patent case
- C. Basmati rice case

3.4 Myriads case on gene patenting

Unit-4: Bio-entrepreneurship **13 Periods**

4.1 Innovations and Entrepreneurship
4.2 Enterprenuership in the Biotechnological Context
4.3 Biotechnology Industry and Firm Structure
4.4 Product Development and Innovation diffusion
4.5 Biotechnology Industry growth Models
4.6 Factors affecting biotech business

References:

1. Goel, Deepa, and Shomini Parashar. *IPR, Biosafety and Bioethics*. Pearson Education India, 2013.
2. Neeraj Pandey and Khushdeep Dharni , Intellectual Property Rights, PHI, 2014
3. Ramakrishna B, Anil Kumar H.S ; Fundamentals of Intellectual Property Rights : For Students, Industrialist and Patent Lawyers ; Notion Press, Chennai, 2017.
4. Shimasaki, Craig. *Biotechnology Entrepreneurship*. Academic Press, 2014.
5. Patzelt, Holger, and Thomas Brenner, eds. *Handbook of bioentrepreneurship*. Vol. 4. Springer Science & Business Media, 2008.
6. Sateesh, M. Kumar. *Bioethics and biosafety*. IK International Pvt Ltd, 2008.
7. Campbell, Alastair V. *Bioethics: the basics*. Routledge, 2013.

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Life Skill Curriculum)

BBT 3 –IIIB Folklore and Folk History of Maharashtra (Value Oriented Life Skills**)**

Marks: External 50 **Total Periods: 45**

Unit- 1: Spiritual Folks of Maharashtra **12 Periods**

1.1 Lalit
1.2 Keertan
1.3 Dashawatar
1.4 Gondhal
1.5 Waghya-Murali
1.6 Sogi,Bhajan and Bharud

Unit-2: Folks For Social Message **10 Periods**

2.1 Vasudeo
2.2 Bahurupi Kuki
2.3 Powada
2.4 Shahiri

Unit-3: Folks for Entairtainment **13 Periods**

3.1 Dhandar
3.2 Kalgi-Tura
3.3 Aikeev Lawni
3.4 Dhangari Gaja
3.5 Tamasa
3.6 Bhutya

Unit- 4: Traditional Folks Dance of Maharashtra **10 Periods**

4.1 Fugdi
4.2 Raut Nacha
4.3 Lavni Dance
4.4 Parvi Nach
4.5 Koli Nrutya

References

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2. Kumar, Pradeep. "Tamasha folk theatre of maharashtra." (1996).
3. Manjula, Kunsoth. "A Study on Indian Folk Dances." *International Journal of Research* 4.14 (2017): 3852-3861.
4. V K Joshi Lok Natyachi Parampata Thokal Prakashan Pune, 1961 p 65
5. R. C. Dere. Lok Sanskhthi Upasak Sahityalay Pune, 1971 p 21
6. Mahadev Shastri Editor Bharatiya Sanskriti Kosh (vol.3) Bharatiya Kosh Mandal Pune p 121
7. V K Joshi Lok Natyachi Parampara Thokal Prakashan Pune, I%1 p 132 6 ibidem p 133.
8. Shinde Gondhal Kalavanth Karad (Dt Satara)
9. R C Dere Maharashtra Tevahar Viswakarma Sahityalay Pune, 1978 p.25
10. Sharad Vyavahare Lok Dharmtya Natyachi J a Jan. (i ha Jan, Viswabharati Prakasan Nagpur, 1990 p.47
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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Life Skill Curriculum)

BBT 3 –IIIB History of Marathwada (Value Oriented Life Skills**)**

Marks: External 50 **Total Periods: 45**

Unit- 1: Dynasty of Marathwada **12 Periods**

1.1 Satvahan Dynasty
1.2 Vakatak Dynasty
1.3 Rashtrakut Dynasty
1.4 Yadav Dynasty

Unit- 2:Marathwada Under the Nizam **11 Periods**

2.1 Nizam's of Hyderabad state
2.2 Political, Religious, Social and Educational condition.
2.3 Hyderabad freedom struggle Hyderabad state congress
2.4 Hyderabad state shedule caste Fedration

Unit- 3:Excavated sites, Art and Architecture of Marathwada **12 Periods**

3.1 ShiurExcavated sites
3.2 Ter Excavated sites
3.3 Kandhar Excavated sites
3.4 Caves - Ajintha, Ellora and Shiur
3.5 Forts - Doulatabad and Kandhar

Unit- 4:Historical Religious sites of Marathwada **10 Periods**

4.1 Sachkhand Gurudwara Nanded
4.2 Aundha Nagnath Temple
4.3 Mallinath Digambar Jain Temple
4.4 Narsi Namdev Temple

References:

1. Singh, Upinder. *A history of ancient and early medieval India: from the Stone Age to the 12th century*. Pearson Education India, 2008.
2. Majumdar, Ramesh Chandra, and Anant Sadashiv Altekar, eds. *Vakataka-Gupta Age Circa 200-550 AD*. Motilal Banarsidass Publ., 1986.
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4. Kate, P. V. *Marathwada under the Nizams, 1724-1948*. Mittal Publications, 1987.
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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

III Semester (Life Skill Curriculum)

BBT 3 –IIIB Civilizational Backdrop OF India (Value Oriented Life Skills**)**

Marks: External 50 **Total Periods: 45**

Unit-1: Prehistoric Age and Indus Valley Civilisation **10 Periods**

1.1 Pre-historic age
1.2 The culture existing during the ancient period.
1.3 Indus Valley Civilisation: the inception, phases of society, economy, and culture
1.4 decline and the end of the Indus Valey civilisation.

Unit-2 :India during Early Age **12 Periods**

1.1 The Mahajanpadas and Janapadas
1.2 The rise of Nanda Dynasty
1.3 The rise of Buddhism: Factors responsible for the spread of Buddhism
1.4 The Rise of Mauryan Empire
1.5 Emperor Ashok and his works:.
1.6 Gupta Dynasty and successors

Unit-3:India During Medieval Period **11 Periods**

3.1 Major Dynastiesof Early Medieval Period
3.2 Cultural and religious circumstances
3.3 Rise of Provincial Dynasties and Vijaynagar Emoire
3.4 The Dominance and Expansion of Mughal Empire

Unit-4 :Indian Civilisation in Modern Period **12 Periods**

1.1 The renaissance of Indian Art forms Renaissance of Indian art and modern Indian literature.
1.2 The Early uprising against British rule
1.3 Development in art ,Literature and architecture in modern history
1.4 Indian freedom movement
1.5 Major personalities in Modern India
A. Mahatma Gandhi
B. Dr. BabasahebAmbedkar

References:

1. Pruthi, R. K., ed. *Indus civilization*. Discovery Publishing House, 2004.
2. Pruthi, Raj, ed. *Vedic civilization*. Discovery Publishing House, 2004.
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Swami Ramanand Teerth Marathwada University Nanded's
New Model Degree College, Hingoli
B.Sc. Biotechnology (CBCS)
II -Year, IV -Semester
Syllabus effective from 2019-20 onwards

Course Code	Course Title	Credits	Total Credits
BBT 4-IA भारतीयभाषा	मराठीभाग- 04/ हिंदीभाग-04	04	**30**
BBT 4-IB English	Reading Literature	04	
BBT 4-IIA-A Major (Core)	Metabolism	04	
BBT 4-IIA-B Major (Core)	Molecular Biology	04	
BBT 4-IIB Major (Supportive)	Developmental Biology	04	
BBT 4-IIC Major (Innovative)	Lab Course-4	04	
BBT 4-IIIA Job Oriented Life Skills	Plant Tissue Culture and Plant Biotechnology	02	
BBT 4-III B Value Oriented Life Skills	Religious and Communal Harmony in India / Peace and Conflict Resolution / Freedom Struggle of India	02	
BBT4-IIA-C Major (Core)	Seminar	01	
BBT 4-IIA-D Major (Core)	Field Visit	01	

Note:

1. Code BBT4-IA, BBT4-IB are Language Curriculums.
2. Code BBT 4-IIA-A, BBT 4-IIA-B, BBT 4-IIA-C, BBT 4-IIA-D, BBT4-IIB, BBT4-IIC are Major Curriculums.
3. BBT4-IIIA, BBT4-III B are Life Skill Curriculums.

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ , नांदेड संचलित

न्यू मॉडेल डिग्री कॉलेज,हिंगोली

बी.एस्सी. जैवतंत्रज्ञान (सत्र पद्धती)

चौथेसत्र (भाषा अभ्यास)

BBT4 – IA:**मराठी भाग-4 (भारतीय भाषा)**

एकूण गुण:अंतर्गत ५० + बहिस्थ५० rkl : 45

v- lfd.k @vkReij @yfyr okMe; @fucU/k %&
rkl&13

1. वंदे मातरम–स्वामी रामानंद तीर्थ
2. स्त्री पुरुष तुलना–ताराबाई शिंदे
3. पोलिसांचा ससेमिरा–लक्ष्मण गायकवाड
4. उन्हाळा–अनिल अवचट
5. नित्ययज्ञाची गरज–विनोबा भावे
6. सहावी पास झालो–किशोर शांताबाई काळे

c- 0;kogkfjd ejkBh %&
rkl&13

1. जाहिरात लेखन
2. सुत्रसंचालन
3. संगणकात मराठीचा उपयोग
4. मराठीतील संक्षीप्तिकरण.

d- Hkk"kk o bVjusV %& rkl&09

1. इंटरनेट स्वरुप व उपयोग
2. मराठी संकेतस्थळाची माहिती

M- Hkk"kk foKku %& rkl&10

1. बोली भाषा व प्रमाण भाषा–स्वरुप, वैशिष्टये, परस्पर संबंध.

lanHkZ xzUFk lwph

1. व्यावहारिक मराठी भाग 2–संपा. डॉ. साहेब खंदारे निर्मल प्रकाशन, नांदेड 2003
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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Language Curriculum)

BBT 4 – IA हिंदीभाग- 04 **(**भारतीयभाषा**)**

Marks: Internal 50 + External 50 Total Periods: 45

खण्ड अ] काथेत्तर गद्य Periods:14

1] मजदूरी और प्रेम - सरदार पूर्णसिंह (निबंध)
२] बेला और गुंगिया - महादेवी वर्मा (रेखाचित्र)
३] घुमक्कड़शास्त्र - राहुल सांकृत्यायन (यात्रा वर्णन)
४] ऊँचा परबत गहरा सागर - विष्णु प्रभाकर (एकांकी)
५] कस्तूरी कुंडल बसे - मैत्रेयी पुष्पा (आत्मकथा अंश)

खण्ड ब] पल्लवन Periods:10

खण्ड क] समाचार लेखन ; विज्ञापन लेखन Periods:11

खण्ड ड] इन्टरनेट और हिंदी भाषा : Periods:10

1] इन्टरनेट : उपयोगिता
२] वेब सर्चिंग : उपयोगिता
३] ब्लॉग लेखन : स्वरुप और पद्धति
४] ई-मेल : निर्माण और सम्प्रेषण

संदर्भ ग्रंथ :

1] हिंदी गद्य की नवीन विधाये - राजेन्द्रप्रसाद श्रीवास्तव (साहित्य रत्नालय कानपूर)
२] प्रयोजनमूलक हिंदी डॉ. लक्ष्मीकान्त पांडेय (विकास प्रकाशन कानपूर)
३] हिंदी कम्प्यूटिंग - श्री. त्रिभुवननाथ शुक्ल (विकास प्रकाशन कानपूर)
४] कार्यालय हिंदी सिद्धांत और प्रयोग - दंगल झाल्टे. (विकास प्रकाशन कानपूर)

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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Language Curriculum)

BBT 4 – IB Reading Literature (English**)**

Marks: Internal 50 + External 50 Total Periods: 45

Unit I: Poetry **10 Periods**

1. What is Literature?
2. What are poetry and Poetic devices?
3. Gitanjali- Rabindranth Tagore
4. Golpitha- Namdev Dhasal

Unit II: Fiction **12 Periods**

1. What is fiction & related terms to fiction
2. The Grass is Singing- Doris Lessing
3. The Guide- R.K. Narayan

Unit III: Prose **12 Periods**

1. Annihilation of Caste- Dr. Ambedkar
2. Discovery of India- Pandit Neharu
3. The Souls of Black Folks- W.E.B. DuBois

Unit IV: Drama **11 Periods**

1. What is a Drama & Dramatic device?
2. Hamlet- William Shakespeare
3. Shakuntala- Kalidasa

References Books:

1. Meyer, Jim. "What Is Literature? A Definition Based on Prototypes." (1997).
2. Simon Ryan; Delyse Ryan. "What is Literature?". Foundation: Fundamentals of Literature and Drama. Australian Catholic University. Retrieved 9 February 2014.
3. Tengse; Ajay Red). The Spectrum Anthology of English Prose, Poetry, Grammar and Communication Skills
4. Easthope, Antony. *Poetry as discourse*. Routledge, 2013.
5. Eliot, TS (1999). "The Function of Criticism". Selected Essays. Faber & Faber. pp. 13–34.
6. Tagore, Rabindranath. *Gitanjali*. Simon and Schuster, 2013.
7. Dhasal, Namdeo. "Golpitha." (1975).
8. Lessing, Doris. *The grass is singing*. No. 131. Heinemann, 1973.
9. Nrayan, R. K. , The Guide
10. Ambedkar, B.R., Annihalation of Caste
11. Neharu, Pandit, Discovery of India
12. Shakespeare, William. Hamlet
13. Kalidas, Shakuntalam

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Major Curriculum)

BBT 4– IIA-A Metabolism (Major Core**)**

Marks: Internal 50 + External 50 Total Periods: 45

Unit-I: Basics of Bioenergetics Periods:12

1.1 Concepts of Thermodynamics
1.1 Types of Biochemical reactions
a. Cleavage
b. Nucleophillic and electrophilic reaction
c. Aldol condensation
d. Rearrangements
e. Elimination
f. Isomerization
g. Free radical reactions
h. Group transfer reactions
i. Oxidation reduction reactions
1.2 ATP as energy currency
1.3 High Energy Compounds

Unit-II: Carbohydrate Metabolism Periods:10

2.1 Glycolysis
2.2 Kreb Cycle
2.3 Fates of pyruvate under anaerobic condition
2.4 Gluconeogenesis
2.5 Glycogen Breakdown
2.6 Pentose Phosphate Pathway
2.7 Electron Transport Chain

Unit-III: Lipid Nucleic acid and Metabolism Periods:14

3.1 Digestion and Transport of fats
3.2 β-Oxidation of saturated fatty acids
3.3 Ketone bodies
3.4 Fatty acid Biosynthesis
3.5 De-Novo biosynthesis of purines and Pyrimidines
3.6 Biosynthesis of Thymidylate
3.7 Catabolism of purine and pyrimidines
3.8 Salvage Pathway

Unit –IV: Metabolism of Amino acids Periods:09

4.1 Overview of amino acid biosynthesis
4.2 Amino group catabolism
4.3 Amination, Deamination and Transamination reactions
4.4 Urea Cycle
4.5 Overview of amino acid catabolism

References:

1. Principles of Biochemistry: Smith et al., McGraw - Hill International book Company, 8th Edition.
2. Principles of Biochemistry - Lehninger , Nelson, Cox, -W.H. Freeman and Company, New York
3. Fundamentals of Biochemistry: Voet et al.- John Wiley and Sons, Inc.
4. Biochemistry: Zubay- WCB publishers
5. Harper's Biochemistry: R.K.Murray, D.K.Granner, P.A.Mayes and V. Rodwell-Prentice-Hall International.
6. Biochemistry: L.Stryer. W.H. Freeman and Company, New York
7. Colour Atlas of Biochemistry:J. Koolman,K.H.Roehm, Second Edn.,ThiemeStutgart,New York
8. Biochemistry-Garrett and Grisham,second Edition,1998

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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Major Curriculum)

BBT 4 – IIA-B Molecular Biology (Major Core**)**

Marks: Internal 50 + External 50 Total Periods: 45

Unit-I: Structure, Chemistry and replication of DNA Periods:08

1.1 Discovery of DNA
1.2 Double Helical Model of DNA
1.3 Chemistry of DNA
1.4 Mechanism of DNA replication
1.5 Enzymes involved in replication

Unit-II: Gene Expression Periods:11

1.1 Genetic Code
1.2 Process of Transcription
1.3 Post Transcriptional Modification
1.4 Process of Translation
1.5 Post Translational Modifications
1.6 Inhibitors of Tanscription and Translation

Unit-III DNA Mutation and Repair and recombination Periods:13

3.1 Mutation Fluctuation Test
3.2 Spontaneous Versus Induced Mutation
3.3 Mutation Rates
3.4 Point Mutations
3.5 Spontaneous Mutagenesis
3.6 Chemical Mutagenesis
3.7 DNA Repair
  a. Damage Reversal
  b. Excision Repair
  c. Double-Strand Break Repair
  d. Postreplicative Repair
3.8 Recombination

Unit-IV Regulation of gene Expression and Extrachromosomal Inheritance Periods:13

4.1 The Operon Model
4.2 Lac Operon (Inducible System)
4.3 Trp Operon (Repressible System)
4.4 Lytic and Lysogenic Cycles in Phage
4.5 Transposable Genetic Elements
4.6 Maternal Effects
  a. Snail Coiling
  b. Moth Pigmentation
4.7 Cytoplasmic Inheritance
  a. Mitochondria
  b. Chloroplasts
  c. Infective Particles

REFERENCES:

1. Understanding DNA-The molecule how it works III ed.- Chris R.Calladine, Elsevier Pub.
2. Gene IX-Benjamin Lewin –Jones and Barrtlett Pub.
3. Principles of Genetics IV ed.-Simmons and Snustad- Wiley International Pub.
4. Molecular Biology of the Gene V ed.-J.D. Watson-Pearson Pub.
5. The Biochemistry of Nucleic Acids XI ed.-Adams, Knowler And Leader-Chapman Hall Pub.
6. Molecular Biology of the Cell VI ed.-Lodish, Berk-Freeman Pub.
7. Developmental Biology V ed.-Scott F. Gilbert-Sinahauer associate Pub.
8. Developmental genetics-G.S.Miglani-I.K.InternationalPub.
9. Molecular Biology of the Cell, Albert Bruce, Garland Science Publication
10. Genome- T.A. Brown, John Wiley
11. Genetics a Molecular Approach, T.A Brown, John Wiley
12. Principles of Genetics- Robert H.Tamarin The McGraw−Hill Companies

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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Major Curriculum)

BBT 4 – II B Developmental Biology (Major Supportive)
Marks: Internal 50 + External 50 **Total Periods: 45**

Unit-I: Principles of Developemental Biology **09 Periods**

1.1 Comparative Embryology
1.2 Evolutionary Embryology
1.3 Medical Embryology and Teratology
1.4 Mathematical Modeling of Development
1.5 Environmental Developmental Biology
1.6 Experimental Embryology
1.7 Developmental Constraints

Unit-II: Early and late Embryonic development in Animals **13 Periods**

2.1 Structure of the Gametes
2.2 Recognition of Egg and Sperm
2.3 Gamete Fusion and Polyspermy
2.4 The Activation of Egg Metabolism
2.5 Early embryonic development of
  a. Sea urchin
  b. Birds
  c. Mammals
2.6 Metamorphosis in insects and amphibians
2.7 Regeneration and aging

Unit-III: Basics of Plant Development **13 Period**

3.1 Pollination mechanisms and adaptations
3.2 Double fertilization
3.3 Seed-structure appendages and dispersal mechanisms.
3.4 Embryo and endosperm
3.5 Apomixis and polyembryony
3.6 Endosperm types, structure and functions
3.7 Dicot and monocot embryo

Unit-IV: Plant Embryology **10 Periods**

4.1 Embryonic Development in plant
4.2 Dormancy
4.3 Germination
4.4 Vegetative Growth
4.5 The Vegetative-to-Reproductive Transition
4.5 Senescence

References:

4. Chordate Embryology & Histology V K Agarwal, Usha GuptaS Chand & Company Ltd
5. Developemental Biology-Gilbert, 6th Edition,Sinauer Associates
6. Developemental Biology of plant-Gupta,S Chand and Company,New Dehli
7. Developemental Biology Protocol:Rocky S. Tuan,Cecilia W. London.
8. Dictionary of Developemental Biology and Embryology: Frank J Dye, Willey – Blackwell
9. Developemental Biology: E.Edward Bittar,Nevillae Bittar-Jai press Inc. London
10. Human Embryology and Developmental biology: Bruce M. Carlson
11. Medical Embryology-Jan Longmann
12. Pandey, S. N., and Ajanta Chadha. *Plant anatomy and embryology*. Vikas publishing house PVT Ltd, 1996.
13. Johansen, Donald Alexander. *Plant embryology*. Chronice Botanica Company; Waltham, Mass, 1950.
14. Johri, Brij Mohan, ed. *Embryology of angiosperms*. Springer Science & Business Media, 2012.

Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Major Curriculum)

BBT 4-IIC Lab Course-III (Major Innovative)

Marks: Internal 50 + External 50 **Total Periods: 45**

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1. Genetic recombination (conjugation, transformation, tranduction) in bacteria.
2. Isolation of genomic DNA from bacteria, animal and plant cells.
3. Isoltion of plasmid DNA by using alkaline lysis method.
4. Agarose gel electrophoresis by using DNA markers for molecular wt. determination.
5. Isolation of antibiotic resistant bacteria by gradient plate method.
6. Replica plating for transfer of bacterial colony.
7. Study of Hens embryo for developmental stage study.
8. Demonstration on mammalian gametes
9. Experiments based on plant development
10. Biochemical estimation of blood sugar
11. Estimation of Glucose, Uric acid and Billurubin from blood/Urine
12. Salivary amylase Assay

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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Life Skill Curriculum)

BBT 4 –IIIA Plant Tissue Culture and Plant Biotechnology (Job Oriented Life Skills**)**

Marks: Internal 50 **Total Periods: 45**

Unit- 1: Introduction to Plant Tissue Culture **10 Periods**

1.1 Laboratory Organisation
1.2 Nutrition Medium
1.3 Sterilisation Techniques
1.4 Types of Culture
A.Seed Culture
B.Embryo Culture
C.callus culture

Unit-2: Advances in plant tissue Culture **12 Periods**

2.1 Micropropogation
2.2 Suspension Culture
2.3 Invitro Production of Haploids
2.4 Protoplast Isolation and Fusion
2.5 Somaclonal Variation

Unit-3: Transgenics in Plant Improvement **11 Periods**

3.1 Methods of Gene Transfer in plants
3.2 Resistance of Crops to biotic and abiotic stress
3.3 Insect resistance
3.4 Virus and Disease resistance
3.5 Herbicide resistance

Unit- 4: Plant Biotechnology for quality **12 Periods**

4.1 Transgenic for improved storage
4.2 Longer life transgenic flowers
4.3 Transgenic plants as bioreactor
4.4 Transgenics for male sterility
4.5 Arguments in favour and against of transgenic crop

References:

1. Chawla, H_S_. *Introduction to Plant Biotechnology (3/e)*. CRC Press, 2011.
2. Chawla, H. S. *Plant biotechnology: a practical approach*. 2003.
3. Singh, B. D., and B. D. Singh. *Biotechnology expanding horizons*. Kalyani publishers, 2007.
4. Dodds, J. H., and L. W. Roberts. *Plant tissue culture*. Cambridge University Press. New York, 1987.
5. White, Philip R. *A handbook of plant tissue culture*. Vol. 56. No. 2. LWW, 1943.
6. Bhojwani, Sant Saran, and Maharaj K. Razdan. *Plant tissue culture: theory and practice*. Vol. 5. Elsevier, 1986.
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NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Life Skill Curriculum)

BBT4 –IIIB Religious And Communal Harmony In India (Value Oriented Life Skills**)**

Marks: External 50 45 Marks

Unit-1 : Theoretical Overview **12 Period**

1.1 Need of Communal harmony

1.2 Fact of National Integration

1.3 Hindu Rights in Promoting National Integration

1.4 Communal Harmony and National Integration

1.5 Role of humanism in communal harmony

1.6 Public participation in national integration

Unit-2 : Religion and Secularism **11 Period**

2.1 National Integration through religion

2.2 Some Hindu-Muslim Cults in Promoting Harmony

2.3 Role of religion in strengthening nation

2.4 Role of Language and culture in national integration

Unit-3 : Women and Communal Harmony **11 Period**

3.1 Role of women in communal harmony

3.2 Portrayal of women and communal Harmony in Media

3.3 Holocaust of women in communal riots

3.4 Role of women in national integration

Unit-4 : Problems of Communalism in India **11 Periods**

4.1 Recent issue in communal tension

4.2 Communal Hatred

4.3 Communal Problem and National Integration

References:

1. Kumar, Gnana Stanley Jaya, and B. V. Muralidhar, eds. *Achieving Communal Harmony and National Integration: A Dream for Every Indian: Papers of UGC National Seminar Held on 6-7 May 1995*. MD Publications Pvt. Ltd., 1997
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3. Ansari, Iqbal A. "Gandhi's Religious Approach to Communal Harmony." *Gandhi and Communal Harmony* (1997): 81.
4. Kumar, Ravindra, ed. *Problem of communalism in India*. Mittal Publications, 1990.
5. Chandra, Bipan. *Communalism in modern India*. Har Anand Publications, 2008.
6. Engineer, Asgharali, ed. *Communal riots in post-independence India*. Universities Press, 1997.
7. Chandra, Bipan. *Communalism: A primer*. Anamika Pub & Distributors, 2004.
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Swami Ramanand Teerth Marathwada University, Nanded's
NEW MODEL DEGREE COLLEGE, HINGOLI
B.SC. Biotechnology (Semester Pattern)

IV Semester (Life Skill Curriculum)

BBT4 –IIIB Peace and conflict Resolution (Value Oriented Life Skills**)**

Marks: External 50 45 Marks

Unit 1: Introduction To Peace **12 Periods**

1.1 Meaning and concepts of peace
1.2 Positive and Negative Peace
1.3 Measuring peace
4.1 The global peace index
1.4 Zones of Instability

Unit- 2: Conflict Analysis **10 Periods**

2.1 Structural conditions
2.2 Conflict and social order
2.3 Traditional management strategies
2.4 Dispute settlement and conflict resolution
2.5 Conflict transformation and Peace Building

Unit -3 : Issues of conflict **12 Periods**

3.1 Understanding of war
3.2 Sources of social conflict
3.3 Feminist understanding of violence
3.4 Political Economy
3.5 Environmental concerns

Unit -4: Strategies for peace **11 Periods**

4.1 Control of Military power
4.2 Conflict resolution and Management
4.3 Self determination
4.4 Global order and governance
4.5 Peace Movements

References:

1. Webel, Charles, and Johan Galtung, eds. *Handbook of peace and conflict studies*. Routledge, 2007.
2. Barash, David P., and Charles P. Webel. *Peace and conflict studies*. Sage, 2008.
3. Jeong, Ho-Won. *Peace and conflict studies: An introduction*. Routledge, 2017.
4. Ryan, Stephen. "Peace and conflict studies today." *The Global Review of Ethnopolitics* 2.2 (2003): 75-82.
5. Matyók, Thomas, Jessica Senehi, and Sean Byrne. *Critical issues in peace and conflict studies: Theory, practice, and pedagogy*. Lexington Books, 2011.
6. Samaddar, Ranabir, ed. *Peace studies: An introduction to the concept, scope, and themes*. SAGE Publications India, 2004.
7. Wallensteen, Peter. *Understanding conflict resolution*. SAGE Publications Limited, 2018.
8. Deutsch, Morton, Peter T. Coleman, and Eric C. Marcus, eds. *The handbook of conflict resolution: Theory and practice*. John Wiley & Sons, 2011.

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B.SC. Biotechnology (Semester Pattern)
IV Semester (Life Skill Curriculum)
BBT4 –IIIB Freedom Struggle of India (Value Oriented Life Skills**)**
Marks: External 50 45 Marks

Unit 1: Revolt of 1857 and Formation of Congress **Periods 10**

1.1 Nature and Causes of revolt
1.2 Consequences of revolt
1.3 Queens Proclamation of 1858
1.4 Formation and Objectives of INC
1.5 INC during 1885-1905
1.1 Partition of Bengal

Unit 2: India After World War-I **Periods 12**

2.1 Rowalt Act
2.2 Jalionwala bag
2.3 Simmon Commission
2.4 Round Table Conference
2.5 Quit India Movement

Unit 3: Gandhian Phase in National Movement **Periods 11**

3.1 Emergence of Gandhi
3.2 Gandhian Theories
3.3 Champaranya Satyagrah
3.4 Kheda Satyagrah
3.5 Ahemdabad Mill Strike

Unit 4- Final Stage of Freedom Struggle **Periods 12**

4.1 Minto-Morley Reforms and Communal representation
4.2 Dyarchy
4.3 Indian Independence act of 1947
4.4 The Making of Indian Constitution
4.5 Role of B.R. Ambedkar

References:

1. Ranajith Guha, A Subaltan Studies Reader (Ed.), Bipin Chandra, Modern India,Orient Blackswan,2009.
2. Ranajith Guha, A Subaltan, Rise and Growth of Economic Nationalism in India,har Anand Publications,Delhi.
3. Ranajith Guha, A Subaltan, India‘s Struggle for Independence,Perguin Books New Delhi.
4. Ranajith Guha, A Subaltan, Nationalism and Colonialism in Modern IndiaOrient Longman,Delhi
5. Ranajith Guha, A Subaltan, Communalism in Modern India, Har Anand Publications Delhi.
6. S.N.Sen, Indian History and Culture, MacMillan India Ltd,2007.
7. R. Desai, Social Background of Indian Nationalism,Popular Book Depot, Bombay.
8. P.N.Chopra, et.al, Modern India, Sterling Publishers, New Delhi, 2005
9. Suresh Sharma and TridipSuhurd, MK Gandhi’s Hind Swaraj,Archers andElevers, Tirthankar Roy, The Economic History of India 1857-1947, OUP, 2006. Peter Hardy, Muslims of British India
10. Sekhar Bandyopadhyaya, From Plassey to Partition and After: A History of Modern India, Orient Blackswan Pvt Ltd

Question Paper Structure for University Exam (ESE).

For Theory Papers	
Maximum Marks: 50	**Time: 3.00 Hours**
Note: 1. Question No. 01 is compulsory 2. Attempt any four among Q.2 to Q. 8. 3. Draw neat well labeled diagram whenever necessary.	
Q. 1 Answer the following in short 10 Marks A. B. C. D. E.	
Q. 2 Descriptive Question 10 Marks	
Q. 3 Descriptive Question	10 Marks
Q. 4 Descriptive Question	10 Marks
Q. 5 Short Note (Solve any two) 10 Marks a) b) c)	
Q. 6 Descriptive Question	10 Marks
Q. 7. Descriptive Question	10 Marks
Q. 8 Descriptive Question	10 Marks

For Practical Paper	
Maximum Marks: 50	**Time: 3.00 Hours**
Q.1 Major Experiment **Or** **Q.1 A.** **B.**	**20 Marks**
Q.2 Minor Question **Or** **Q.2 Identify and comment on following spots**	**15 Marks**
Q.3 Record Book	**10 Marks**
Q.4 Viva-Voce	**05 Marks**

Note: Similar pattern should be applied for Internal Practical Assessment

Internal Assessment for Theory Paper (CA)
Maximum Marks-50
Internal Exam of theory paper should follow following pattern for continuous Assessment I. Two mid -term exam of 15 Marks Each II. Assignment of 20 Marks

Internal Assessment for Seminar (CA)	
Maximum Marks-25	
Students have to choose any title related with basic or applied knowledge of any Major Core papers of respective semester and should present with power point presentation. For assessment of seminar following marking system will be followed	
I. Expression	05 Marks
II. Presentation Skill	05 Marks
III. Subject Knowledge	10 Marks
IV. Ability to Answer	05 Marks

Internal Assessment for Field visit (CA)
Maximum Marks-25
Student have to visit nearby Industry/National Laboratory /Site/Consultancy to gain deep knowledge of the course .Assessment of candidate will be based on actual presence of candidate on site and preparation of excursion report of the visit.

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